گزارش برگزاری

دوازدهمین کنفرانس بین المللی کامپیوتر و مهندسی دانش

۲۶ و ۲۷ آبان ۱۴۰۱

دانشگاه فردوسی مشهد، دانشکده مهندسی، گروه مهندسی کامپیوتر

دانشگاه فردوسی مشهد

دانشکده مهندسی

دوازدهمین کنفرانس بین المللی کامپیوتر و مهندسی دانش

ICCKE2022

دانشگاه فردوسی مشهد

دوازدهمین کنفرانس بین المللی کامپیوتر و مهندسی دانش

ICCKE2022

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ICCKE 2022

12th International Conference on Computer and Knowledge Engineering

Ferdowsi University of Mashhad, Mashhad, Iran

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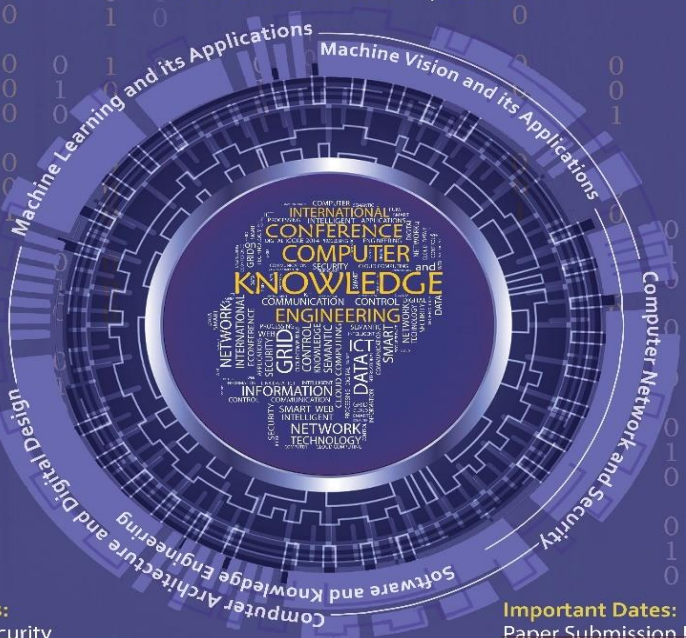

Conference General Topics:

Computer Network and Security
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Machine Learning and its Applications
Software and Knowledge Engineering
Computer Architecture and Digital Design

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Important Dates:

~~Paper Submission Deadline: June 20, 2022~~
Hard Deadline: July 31, 2022
Notification of Acceptance: September 1, 2022
Camera Ready Deadline: September 25, 2022
Early Bird Registration: September 25, 2022
Registration Deadline: October 25, 2022
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مقدمه

دوازدهمین دوره کنفرانس بین‌المللی کامپیوتر و مهندسی دانش ICCKE2022 توسط گروه مهندسی کامپیوتر دانشگاه فردوسی مشهد در طی سال‌های ۲۰۱۱ تا ۲۰۲۲ بصورت مجازی برگزار شد. در این دهه مقالات ارزشمند زیادی دریافت و مقالات پذیرفته شده توسط IEEE Xplore نمایه‌سازی شده است. این کنفرانس در شروع دهه دوم فعالیت خود علاوه بر اهداف قبلی، دو سیاست ارتقای علمی کنفرانس در سطح ملی و بین‌المللی و نیز توسعه روابط با صنایع مرتبط جهت افزایش پژوهش‌های کاربردی را دنبال کرده است. کمیته علمی کنفرانس از ۲۸ عضو هیأت علمی گروه‌های مهندسی کامپیوتر دانشگاه فردوسی مشهد، ۲۱ عضو هیأت علمی از ۱۴ دانشگاه مطرح ملی و ۱۹ عضو هیأت علمی از ۱۷ دانشگاه مطرح بین‌المللی تشکیل شده است.

دوازدهمین کنفرانس مهندسی کامپیوتر و دانش در روزهای ۲۶ و ۲۷ آبان ماه با حضور متخصصان داخلی و خارجی و به‌صورت مجازی برگزار شد. این کنفرانس در پنج موضوع اصلی شامل مهندسی نرم افزار و دانش، یادگیری ماشین و کاربردهای آن، بینایی ماشین و کاربردهای آن، شبکه‌های کامپیوتری و امنیت و همچنین طراحی دیجیتال و معماری کامپیوتر با بالغ بر ۲۳ محور برگزار شد. در این کنفرانس از ۱۹۴ مقاله رسیده که توسط ۲۲۷ داور مورد بررسی قرار گرفت و بعد از انجام مجموعا ۷۱۶ داوری، ۸۴ مقاله برای شرکت و ارائه در این کنفرانس پذیرفته شد. بعلاوه چهار سخنرانی کلیدی و چهار کارگاه آموزشی برگزار شد.

کنفرانس در یک نگاه

روز اول پنجشنبه ۲۶ آبان ۱۴۰۱		
صبح	۸:۳۰ تا ۹	افتتاحیه سخنرانی دبیر کنفرانس سخنرانی مدیر گروه مهندسی کامپیوتر
	۹ تا ۱۰:۳۰	نخستین سخنرانی کلیدی دکتر پرهامی
	۱۰:۳۰ تا ۱۱	استراحت
	۱۱ تا ۱۳	نشست‌های تخصصی ۱ تا ۳ بینایی ماشین یادگیری ماشین مهندسی نرم افزار
نهار و نماز	۱۳ تا ۱۴	
بعد از ظهر	۱۴ تا ۱۵:۳۰	نشست‌های تخصصی ۴ تا ۶ بینایی ماشین یادگیری ماشین سایر
	۱۵:۳۰ تا ۱۶	استراحت
	۱۶ تا ۱۷	دومین سخنرانی کلیدی دکتر شی (Dr. Shih)
	۱۷:۳۰ تا ۱۹	استراحت
	۱۷:۳۰ تا ۱۹	نشست‌های تخصصی ۷ تا ۹ بینایی ماشین یادگیری ماشین معماری کامپیوتر

روز دوم جمعه ۲۷ آبان ۱۴۰۱		
صبح	۹ تا ۱۰:۳۰	نشست‌های تخصصی ۱۰ تا ۱۳ بینایی ماشین یادگیری ماشین مهندسی نرم افزار شبکه کامپیوتری
	۱۰:۳۰ تا ۱۱	استراحت
	۱۱ تا ۱۲	سومین سخنران کلیدی دکتر اسکاراموزا (Dr.Scaramuzza)
نهار و نماز	۱۳ تا ۱۴	
بعد از ظهر	۱۴ تا ۱۵:۳۰	نشست‌های تخصصی ۱۴ تا ۱۷ بینایی ماشین یادگیری ماشین مهندسی نرم افزار شبکه کامپیوتری
	۱۵:۳۰ تا ۱۶	استراحت
	۱۶ تا ۱۷	چهارمین سخنران کلیدی دکتر ژانگ (Dr.Zhang)
	۱۷ تا ۱۷:۳۰	استراحت
	۱۷:۳۰ تا ۱۹	نشست‌های تخصصی ۱۸ تا ۲۱ بینایی ماشین یادگیری ماشین معماری کامپیوتر شبکه کامپیوتری
	۱۹ تا ۱۹:۳۰	اختتامیه

حامیان

ارتباط کنفرانس دوازدهم با صنایع، سازمان‌ها و شرکت‌ها محدود به جذب حمایت مالی نبوده و با مشارکت افراد متخصص و توانمند و عضویت ایشان در کمیته راهبردی و برنامه‌ریزی بخش کاربردی کنفرانس جهت بهره‌مندی از فرصت‌های زیر، تلاش شد گامی موثر در هم‌افزایی بیشتر دانشگاه و جامعه برداشته شود. با ادامه این تعامل از یکسو شاهد رشد کاربرد محور شدن پژوهش‌های دانشگاهی و از سوی دیگر پژوهش‌محور شدن فعالیت‌های کاربردی خواهیم بود.

- ✓ شرکت در رویداد جذب نیرو برای حامیان کنفرانس
- ✓ برگزاری مشترک رویداد اختصاصی معرفی شرکت و طرح مسئله با حضور اساتید و دانشجویان تحصیلات تکمیلی
- ✓ درج لینک صفحه وب جهت جمع آوری اطلاعات شرکت کنندگان برای همکاری با شرکت‌ها در سایت کنفرانس
- ✓ شرکت در پنل تخصصی کنفرانس
- ✓ مشارکت و همکاری در امور اجرایی کنفرانس

بعلاوه کنفرانس دوازدهم از انجمن‌های مرتبط و دانشگاه‌های مطرح ملی برای حمایت، همراهی و مشارکت در اهداف مهم کنفرانس دعوت به همکاری شد. ادامه این تعامل موجب ارتقای کنفرانس در ابعاد مختلف از جمله پیشنهاد سخنران کلیدی از سوی انجمن‌ها و دانشگاه و نیز پیشنهاد مقالات منتخب برای چاپ در مجلات پژوهشی مرتبط از سوی کنفرانس خواهد شد.

دوازدهمین کنفرانس بین المللی کامپیوتر و مهندسی دانش

ICCKE2022

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Association

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Iranian E-commerce
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انجمن فناوری اطلاعات و ارتباطات ایران
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کمیته اجرایی

کمیته اجرایی کنفرانس از بین دانشجویان کارشناسی و کارشناسی ارشد مهندسی کامپیوتر در دانشگاه فردوسی مشهد تشکیل شده است:

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۹. طوبی محمدیان اهرابی
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۱۱. محیا احسانی مهر
۱۲. زهرا نیازی
۱۳. بهاره کیوانی
۱۴. صالح ابراهیمیان
۱۵. الهام فتحی پور
۱٦. عارف طالب زاده

کمیته علمی

در این کنفرانس برای پیگیری سیاست ارتقای علمی کنفرانس در سطح ملی و بین المللی با اعضای هیات علمی دانشگاه‌های معتبر و متخصصان صنعتی در سطح ملی و بین‌المللی مکاتبه و در نتیجه کمیته علمی کنفرانس به شرح جدول زیر تعیین شد. در این کمیته از ۲۸ عضو هیأت علمی گروه‌های مهندسی کامپیوتر دانشگاه فردوسی مشهد، ۲۱ عضو هیأت علمی از ۱۴ دانشگاه مطرح ملی و ۱۹ عضو هیأت علمی از ۱۷ دانشگاه مطرح بین‌المللی تشکیل شده است.

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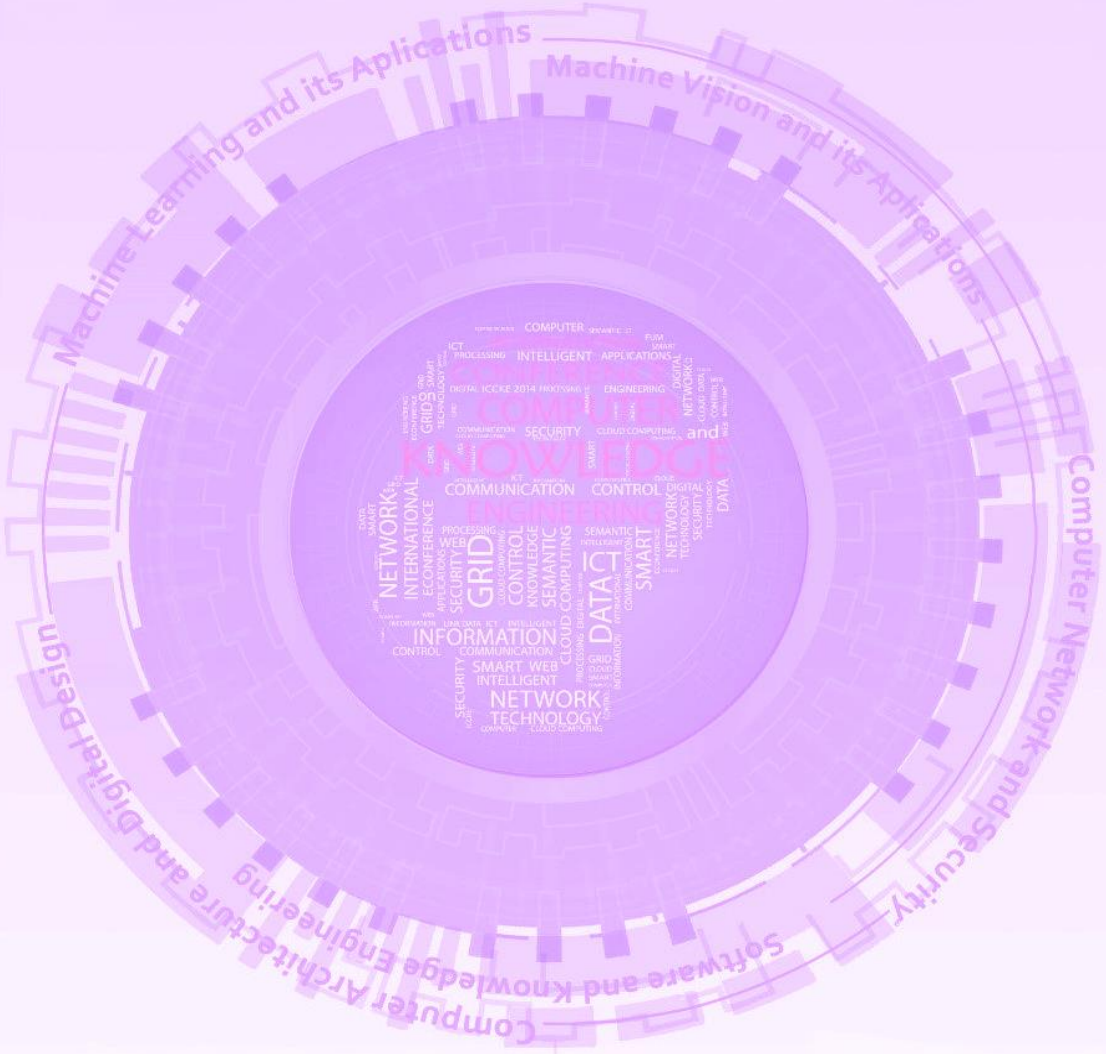

موضوعات و محورهای کنفرانس

موضوعات و محورهای کنفرانس شامل ۵ محور اصلی شامل: بینایی ماشین و کاربردهای آن (۲۴ مقاله)، یادگیری ماشین و کاربردهای آن (۲۵ مقاله)، مهندسی دانش و نرم افزار (۱۲ مقاله)، معماری کامپیوتر و طراحی سیستمهای دیجیتال (۷ مقاله)، شبکه‌های کامپیوتری و امنیت (۱۲ مقاله) و سایر (۴ مقاله) که زیربخش‌های هرکدام به شرح زیر است:

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۱	بینایی ماشین و کاربردهای آن (دکتر امیرحسین طاهری نیا)	پردازش تصویر	دکتر امیرحسین طاهری نیا
		تشخیص بصری: طبقه بندی، تشخیص و نمایه‌سازی	دکتر احسان فضل ارثی
		تجزیه و تحلیل و پردازش ویدئو	دکتر عابدین واحدیان
		پردازش تصویر پزشکی	دکتر حمیدرضا پوررضا
۲	یادگیری ماشین و کاربردهای آن (دکتر جواد حمیدزاده)	یادگیری ماشینی	دکتر جواد حمیدزاده
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		مدل‌های گرافیکی احتمالی	دکتر احد هراتی
		محاسبات نرم	دکتر مجتبی روحانی
		محاسبات تکاملی و روش‌های بهینه‌سازی فراابتکاری	دکتر محمد معطر
		تشخیص الگو و کاربردها	دکتر سهیلا اشکذری طوسی
۳	مهندسی نرم افزار و دانش (دکتر عباس رسول زادگان)	مهندسی نرم افزار	دکتر عباس رسول زادگان
		وب معنایی و NLP	دکتر محسن کاهانی
		تجزیه و تحلیل داده ها	دکتر بهشید بهکمال

ردیف	موضوع (دبیر)	محور	مسئول محور
۴	شبکه کامپیوتری و امنیت (دکتر هاله امین طوسی)	شبکه‌های بی سیم و حسگر	دکتر سید امین حسینی سنو
		امنیت کامپیوتر و رمز شناسی	دکتر عباس قائمی بافقی
		مدیریت اعتماد و امنیت نرم	دکتر هاله امین طوسی
		کاربردهای فناوری اطلاعات و ارتباطات در شبکه هوشمند	دکتر حسن شاکری
		اینترنت اشیاء	دکتر محمدحسین یغمایی
		شهر هوشمند و مخابرات هوشمند	دکتر امیرحسین مهاجرزاده
		گرید و محاسبات ابری	دکتر سعید ابریشمی
۵	معماری کامپیوتر و طراحی دیجیتال (دکتر یاسر صداقت)	برنامه نویسی و معماری موازی	دکتر حمید نوری
		طراحی سیستم دیجیتال	دکتر یاسر صداقت
		سیستم‌های تعبیه شده قابل اعتماد و بلادرنگ	دکتر سارا ارشادی نسب

سخنرانی‌های کلیدی و مدعو

- **سخنران کلیدی اول: دکتر پرهامی**
- **عنوان سخنرانی: Eight Key Ideas in Computer Architecture from Eight Decades of Innovation**

بهروز پرهامی (دکترای علوم کامپیوتر از دانشگاه کالیفرنیا، لس آنجلس، ۱۹۷۳) استاد مهندسی برق و کامپیوتر و استادیار سابق پرسنل دانشگاهی، دانشکده مهندسی در دانشگاه کالیفرنیا، سانتا باربارا است. او دارای علایق تحقیقاتی در محاسبات کامپیوتری، پردازش موازی و محاسبات قابل اعتماد است. در سمت قبلی خود در دانشگاه صنعتی شریف (آریامهر سابق) در تهران، ایران (۱۳۵۳-۱۳۶۷) نیز در برنامه‌ریزی آموزشی، تدوین برنامه درسی، تلاش های استانداردسازی، انتقال فناوری و مسئولیت‌های سردبیری مختلف از جمله پنج سال به عنوان سردبیر گزارش کامپیوتر، یک دوره محاسبات زبان فارسی مشغول بود. انتشارات فنی او شامل بیش از ۳۰۰ مقاله در مجلات معتبر و کنفرانس های بین المللی، یک کتاب درسی به زبان فارسی و یک واژه نامه انگلیسی/فارسی است. از جمله انتشارات او سه کتاب درسی در مورد پردازش موازی (پلنوم، ۱۹۹۹)، محاسبات کامپیوتری (آکسفورد، ۲۰۰۰؛ ویرایش دوم ۲۰۱۰)، و معماری کامپیوتر (آکسفورد، ۲۰۰۵) است. پروفسور پرهامی عضو مادام العمر IEEE، عضو IET، عضو خبره انجمن کامپیوتر بریتانیا، عضو انجمن ماشین های محاسباتی و انجمن آموزش مهندسی آمریکا و عضو ممتاز انجمن انفورماتیک ایران است. او به عنوان یکی از اعضای موسس و رئیس جمهور در طی سال‌های ۱۹۷۹-۱۹۸۴ خدمت کرد. پروفسور پرهامی در هیئت تحریریه IEEE Trans خدمت کرده است. محاسبات پایدار (از سال ۲۰۱۶)، IEEE Trans. سیستم های موازی و توزیع شده (۲۰۰۶-۲۰۱۰) و سیستم‌های بین المللی موازی، نوظهور و توزیع شده (۲۰۰۶-۲۰۱۲). او همچنین ریاست بخش IEEE ایران (۱۹۷۷-۱۹۸۶)، مدال صد ساله IEEE را در سال ۱۹۸۴ دریافت کرد و در سال ۲۰۱۰ مفتخر به دریافت جایزه مقاله پراستناد از J. Parallel & Distributed Computing شد. فعالیت های مشاوره ای او طراحی سیستم های دیجیتال با کارایی بالا و مسائل مربوط به مالکیت فکری را پوشش می دهند.

- **صفحه شخصی:** https://web.ece.ucsb.edu/~parhami

- **سخنران کلیدی دوم: دکتر شی (Dr. Shih)**
- **عنوان سخنرانی: AI Deep Learning in Image Processing Research**

علایق تحقیقاتی فرانک شی بر یادگیری ماشینی، هوش مصنوعی، پردازش تصویر، بینایی کامپیوتر، واترمارک دیجیتال و استگانوگرافی، پزشکی قانونی و امنیت، گرافیک کامپیوتری، حسگر ربات، تصویربرداری پزشکی، منطق فازی، تشخیص الگو، شبکه های عصبی، پردازش موازی متمرکز است.

- **صفحه شخصی:** https://web.njit.edu/~shih/

- **سخنران کلیدی سوم: دکتر اسکاراموزا (Dr.Scaramuzza)**
- **عنوان سخنرانی: Autonomous Vision-based Drones**

دیوید اسکاراموزا، استاد رباتیک و ادراک در دانشگاه زوریخ است که در تلاقی رباتیک، بینایی کامپیوتر و یادگیری ماشین تحقیق می‌کند تا ناوبری مستقل و سریع هواپیماهای بدون سرنشین را با استفاده از رویدادهای استاندارد و نورومورفیک ممکن سازد. او پیشگام ناوبری خودکار و مبتنی بر بینایی هواپیماهای بدون سرنشین بود که الهام بخش هلیکوپتر مریخ ناسا است. او اغلب به عنوان مشاور سازمان ملل متحد، از جمله برنامه اقدام آژانس بین المللی انرژی اتمی فوکوشیما در مورد امنیت هسته ای خدمت کرده است. او برای کمک‌های تحقیقاتی خود جوایز معتبری مانند کمک هزینه شورای تحقیقات اروپا (ERC)، جایزه شغلی اولیه انجمن رباتیک و اتوماسیون IEEE، کمک هزینه شروع SNF-ERC، جایزه تحقیقات گوگل، جایزه پژوهشی دانشکده ممتاز فیس بوک و چندین جایزه کاغذی را دریافت کرد. او در سال ۲۰۱۵، زوریخ-آی، فیسبوک زوریخ را تأسیس کرد که هدست واقعیت مجازی Oculus Quest پیشرو در جهان را توسعه داد که بیش از ۱۰ میلیون دستگاه فروخته شد. بسیاری از جنبه‌های تحقیقات او در رسانه‌های گسترده‌تری مانند نیویورک تایمز، اکونومیست، فوربس، بی‌بی‌سی نیوز، کانال دیسکاوری به‌طور برجسته نشان داده شده است.

- **صفحه شخصی:** https://rpg.ifi.uzh.ch/people_scaramuzza.html

- **سخنران کلیدی چهارم: دکتر ژانگ (Dr.Zhang)**
- **عنوان سخنرانی: Knowledge engineering for COVID-19 recognition**

پروفسور یودونگ ژانگ (عضو ارشد IEEE) مدرک لیسانس را در علوم اطلاعات، مدرک کارشناسی ارشد در مهندسی ارتباطات و اطلاعات را از دانشگاه هوانوردی و فضانوردی نانجینگ، به ترتیب در سال‌های ۲۰۰۴ و ۲۰۰۷، و مدرک دکترا در پردازش سیگنال و اطلاعات را از دانشگاه جنوب شرقی، در سال ۲۰۱۰ دریافت کرد. او از سال ۲۰۱۰ تا ۲۰۱۲ در دانشگاه کلمبیا فوق دکترا و به عنوان دستیار دانشمند پژوهشی از سال ۲۰۱۲ تا ۲۰۱۳ در بنیاد تحقیقاتی بهداشت روانی بود. او از سال ۲۰۱۳ تا ۲۰۱۷ در دانشگاه عادی نانجینگ استاد تمام بود. او در حال حاضر استاد دانشکده انفورماتیک، دانشگاه لستر، انگلستان است و علایق تحقیقاتی او شامل یادگیری عمیق و تجزیه و تحلیل تصویر پزشکی است. زمینه های تحقیقاتی او شامل هوش مصنوعی در تجزیه و تحلیل تصاویر پزشکی است. او یکی از اعضای IET (FIET) و عضو ارشد IEEE، IES و ACM است. او در بین محققان چینی با بیشترین استناد (علوم رایانه) توسط Elsevier از سال ۲۰۱۴ تا ۲۰۱۸ قرار گرفت. او دریافت کننده Web of Science Highly Cited Researcher در سال ۲۰۱۹، Emerald Citation of Excellence در سال ۲۰۱۷ و ده مقاله برتر MDPI با بیشترین استناد در سال ۲۰۱۵ بود. او در Guide2Research در رده دانشمند برتر قرار گرفت.

- **صفحه شخصی:** https://le.ac.uk/people/yudong-zhang

نشست‌ها

مقالات کنفرانس ICCKE2022 که بیشتر آنها مربوط به یادگیری ماشین می‌باشد در ۲۱ نشست به صورت زیر توسط نویسندگان مقالات ارائه شد.

عنوان نشست: بینایی ماشین (MV1)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۱
رئیس نشست: دکتر سعادتمند

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1026	Soccer Video Event Detection Using Metric Learning Ali Karimi - Ramin Toosi - Mohammad Ali Akhaee	Ali Karimi
۲	ICCKE-1089	Word-level Persian Lipreading Datase Javad Peymanfard - Ali Lashini - Samin Heydarian - Hossein Zeinali - Nasser Mozayani	Javad Peymanfard
۳	ICCKE-1116	No-Reference Video Quality Assessment by Deep Feature Maps Relations Amir Hossein Bakhtiari - Azadeh Mansouri	Amir Hossein Bakhtiari
۴	ICCKE-1148	A Survey on Semi-Automated and Automated Approaches for Video Annotation Samin Zare - Mehran Yazdi	Samin Zare

عنوان نشست: یادگیری ماشین (ML1)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۱
رئیس نشست: دکتر اکبرزاده

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1058	MCRS-SAE: multi criteria recommender system based on sparse autoencoder Amir reza Kalantarnezhad - Javad Hamidzadeh	Amir reza Kalantarnezhad
۲	ICCKE-1068	Dual Memory Structure for Memory Augmented Neural Networks for Question-Answering Tasks Amir Bidokhti - Shahrokh Ghaemmagham	Amir Bidokhti
۳	ICCKE-1083	Persis: A Persian Font Recognition Pipeline Using Convolutional Neural Networks Mehrdad Mohammadian - Neda Maleki - Tobias Olsson - Fredrik Ahlgren	Mehrdad Mohammadian
۴	ICCKE-1100	AVID: A VARIATIONAL INFERENCE DELIBERATION FOR META-LEARNING Alireza Javaheri - Arsham Gholamzadeh Khoee - Saeed Reza Kheradpisheh - Hadi Farahani - Mohammad Ganjtabesh	Alireza Javaheri

عنوان نشست: مهندسی نرم افزار (SE1) روز و زمان نشست : ۲۶ آبان – ساعت ۱۱ رئیس نشست: دکتر سوادی			
ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1021	DevRanker: An Effective Approach to Rank Developers for Bug Report Assignment Mohammad Reza Kardoost - Mohammad Reza Moosavi - Reza Akbari	Mohammad Reza Kardoost
۲	ICCKE-1066	A Rule-Based Language for Configurable N-way Model Matching Mohammad-Sajad Kasaei - Mohammadreza Sharbaf - Bahman Zamani	Mohammad-Sajad Kasaei
۳	ICCKE-1128	Experimental evaluation and comparison of anti-pattern detection tools by the gold standard Somayeh Kalhor - Mohammad reza Keyvanpour - Afshin Salajegheh	Somayeh Kalhor
۴	ICCKE-1149	Solving the influence maximization problem by using entropy and weight of edges Farzaneh Kazemzadeh - Mitra Mirzarezaee - Ali Asghar Safaei	Farzaneh Kazemzadeh

عنوان نشست: بینایی ماشین (MV2) روز و زمان نشست : ۲۶ آبان – ساعت ۱۴ رئیس نشست: دکتر ایمانی			
ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1025	Crack Segmentation in Civil Structure Images Using a Deep Learning Based Multi-Classifier System Mohammadreza Asadi - Seyedeh Sogand Hashemi - Mohammad Taghi Sadeghi	Mohammadreza Asadi
۲	ICCKE-1051	Pyramid Transformer for Traffic Sign Detection Omid Nejati manzari - Amin Boudesh - Shahriar B. Shokouhi	Omid Nejati manzari
۳	ICCKE-1070	Deep Inside Tor: Exploring Website Fingerprinting Attacks on Tor Traffic in Realistic Settings Amirhossein Khajehpour - Farid Zandi - Navid Malekghaini - Mahdi Hemmatyar - Naeimeh Omidvar - Mahdi Jafari Siavoshani	Amirhossein Khajehpour
۴	ICCKE-1119	A Novel Deep Learning Framework For Image KeyPoint Description Javid Norouzi - Alireza Liaghat - Mohammad Sadegh Helfroush - Habibollah Danyali	Javid Norouzi

عنوان نشست: یادگیری ماشین (ML2)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۴
رئیس نشست: دکتر روحانی

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1005	A Hybrid Echo State Network for Hypercomplex Pattern Recognition, Classification, and Big Data Analysis Mohammad Jamshidi - Fatemeh Daneshfar	Mohammad Jamshidi
۲	ICCKE-1031	The Effect of Network Environment on Traffic Classification Abolghasem Rezaei Khesal - Mehdi Teimouri	Mehdi Teimouri
۳	ICCKE-1038	IranITJobs2021: a Dataset for Analyzing Iranian Online IT Job Advertisements Collected Using a New Crowdsourcing Process Fakhroddin Noorbehbahani - Nikta Akbarpour - Mohammad Reza Saeidi	Nikta Akbarpour
۴	ICCKE-1040	Improving performance of multi-label classification using ensemble of feature selection and outlier detection Mohammad Ali Zarif - Javad Hamidzadeh	Mohammad Ali Zarif

عنوان نشست: سایر (OT2)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۴
رئیس نشست: دکتر ابریشمی

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1049	Multi-Task Transformer for Stock Market Trend Prediction Seyed Morteza Mirjebreili - Ata Solouki - Hamidreza Soltanalizadeh - Mohammad Sabokrou	Seyed Morteza Mirjebreili
۲	ICCKE-1071	Cross-project Defect Prediction with An Enhanced Transfer Boosting Algorithm Nazgol Nikravesh - Mohammad Reza Keyvanpour	Nazgol Nikravesh
۳	ICCKE-1109	An optimal workflow scheduling method in cloud-fog computing using three-objective Harris-Hawks algorithm Ahmadreza Montazerolghaem - Maryam Khosravi - Fatemeh Rezaee	Maryam Khosravi
۴	ICCKE-1150	Span-prediction of Unknown Values for Long-sequence Dialogue State Tracking Marzieh Naghdi Dorabati - Reza Ramezani - Mohammad Ali Nematbakhsh	Marzieh Naghdi Dorabati

عنوان نشست: بینایی ماشین (MV3)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۷:۳۰
رئیس نشست: دکتر فضل

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1002	Early detection of Parkinson's disease using Convolutional Neural Networks on SPECT images Reyhaneh Dehghan - Marjan Naderan - Seyyed Enayatallah Alavi	Reyhaneh Dehghan
۲	ICCKE-1060	Segmentation of Hard Exudates in Retinal Fundus Images Using BCDU-Net Nafise Ameri - Nasser Shoeibi - Mojtaba Abrishami	Nafise Ameri
۳	ICCKE-1093	Fatty Liver Level Recognition Using Particle Swarm Optimization (PSO) Image Segmentation and Analysis Seyed Muhammad Hossein Mousavi - Vyacheslav Lyashenko - Atiye Ilanloo - S. Younes Mirinezhad	Seyed Muhammad Hossein Mousavi
۴	ICCKE-1099	Classification of COVID-19 and Nodule in CT Images using Deep Convolutional Neural Network Amirhossein Ghaemi - Seyyed Amir Mousavi mobarakeh - Habibollah Danyali - Kamran Kazemi	Amirhossein Ghaemi

عنوان نشست: یادگیری ماشین (ML3)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۷:۳۰
رئیس نشست: دکتر بهکمال

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1088	Extreme Gradient Boosting (XGBoost) Regressor and Shapley Additive Explanation for Crop Yield Prediction in Agriculture Dennis A/L Mariadass - Ervin Gubin Moung - Maisarah Mohd Sufian - Ali Farzamnia	Dennis A/L Mariadass
۲	ICCKE-1096	Introducing E4MT and LMBNC: Persian pre-processing utilities Zakieh Shakeri - Mehran Ziabary - Behrooz Vedadian - Fatemeh Azadi - Saeed Torabzadeh - Arian Atefi	Zakieh Shakeri
۳	ICCKE-1103	City Intersection Clustering and Analysis Based on Traffic Time Series Mohammad Aminazadeh - Fakhroddin Noorbehbahani	Mohammad Aminazadeh
۴	ICCKE-1123	Damage Detection After the Earthquake Using Sentinel-1 and 2 Images and Machine Learning Algorithms (Case Study: Sarpol-e Zahab Earthquake) Niloofar Alizadeh - Behnam Asghari Beirami - Mehdi Mokhtarzade	Niloofar Alizadeh
۵	ICCKE-1161	Robat-e-Beheshti: A Persian Wake Word Detection Dataset for Robotic Purposes Parisa Ahmadzadeh Raji - Yasser Shekofteh	Parisa Ahmadzadeh Raji

عنوان نشست: معماری کامپیوتر (CA3)
روز و زمان نشست : ۲۶ آبان – ساعت ۱۷:۳۰
رئیس نشست: دکتر صداقت

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1050	TCAR: Thermal and Congestion-Aware Routing Algorithm in a Partially Connected 3D Network on Chip Majid Nezarat - Masoomeh Momeni	Majid Nezarat
۲	ICCKE-1007	Robustness Scan of Digital Circuits Using Convolutional Neural Networks Mobin Vaziri - Mohammad Mehdi Rahimifar - Hadi Jahanirad	Mohammad Mehdi Rahimifar
۳	ICCKE-1009	Design and Simulation of a Low PDP Full Adder by Combining Majority Function and TGDI Technique in CNTFET Technology Mahsa Mohammadi	Mahsa Mohammadi
۴	ICCKE-1189	FAST: FPGA Acceleration of Neural Networks Training Alireza Borhani - Mohammad Hossein Goharinejad - Hamid Reza Zarandi	Alireza Borhani

عنوان نشست: بینایی ماشین (MV4)
روز و زمان نشست : ۲۷ آبان – ساعت ۹
رئیس نشست: دکتر معطر

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1113	Weakly Supervised Convolutional Neural Network for Automatic Gleason Grading of Prostate Cancer Maryam Kamareh - Mohammad Sadegh Helfroush - Kamran Kazemi	Maryam Kamareh
۲	ICCKE-1114	A Novel Deformable Registration Method for Cerebral Magnetic Resonance Images Bahareh Asadpour Dasht Bayaz - Mahdi Saadatmand - Fabrice Wallois	Bahareh Asadpour Dasht Bayaz
۳	ICCKE-1185	Spatial-channel attention-based stochastic neighboring embedding pooling and long short term memory for lung nodules classification AHMED SAIHOOD - HOSSEIN KARSHENAS - AHMADREZA NAGHSH NILCHI	AHMED SAIHOOD
۴	ICCKE-1024	Attention Transfer in Self-Regulated Networks for Recognizing Human Actions from Still Images Masoumeh Chapariniya - Sara Vesali Barazande - Seyed Sajad Ashrafi - Shahriar B.Shokouhi	Masoumeh Chapariniya

عنوان نشست: یادگیری ماشین (ML4) روز و زمان نشست : ۲۷ آبان – ساعت ۹ رئیس نشست: دکتر میرزا وزیری			
ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1163	Facial Mask Wearing Condition Detection Using SSD MobileNetV2 Amirhossein Tighkhorshid - Yasamin Borhani - Javad Khoramdel - Esmaeil Najafi	Amirhossein Tighkhorshid
۲	ICCKE-1177	A 2D-CNN Architecture for Improving the Classification Accuracy of an Electronic Nose with Different Sensor Positions Hannaneh Mahdavi - Reza Goldoust - Saeideh Rahbarpour	Hannaneh Mahdavi
۳	ICCKE-1182	Weakly Supervised Learning in a Group of Learners with Communication Ali Ganjbakhsh - Ahad Harati	Ali Ganjbakhsh
۴	ICCKE-1194	Hate Sentiment Recognition System For Persian Language Pegah Shams jey - Arash Hemmati - Ramin Toosi - Mohammad ali Akhaee	Pegah Shams jey

عنوان نشست: مهندسی نرم افزار (SE4) روز و زمان نشست : ۲۷ آبان – ساعت ۹ رئیس نشست: دکتر اله بخش			
ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1077	Recommending Popular Locations Based on Collected Trajectories Mohammad Rabbani bidgoli - Saber Ziaei	Mohammad Rabbani bidgoli
۲	ICCKE-1107	Analysis of Address Lifespans in Bitcoin and Ethereum Amir Mohammad Karimi Mamaghan - Amin Setayesh - Behnam Bahrak	Amir Mohammad Karimi Mamaghan
۳	ICCKE-1122	Maximum diffusion of news in social media with the approach of reducing the search space Masoud Karian	Masoud Karian
۴	ICCKE-1190	An interactive user groups recommender system based on reinforcement learning Hediyeh Naderi Allaf - Mohsen Kahani	Hediyeh Naderi Allaf

عنوان نشست: شبکه کامپیوتری (CN4) روز و زمان نشست : ۲۷ آبان – ساعت ۹ رئیس نشست: دکتر شاکری			
ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1043	Improved TrustChain for Lightweight Devices Seyed Salar Ghazi - Haleh Amintoosi	Seyed Salar Ghazi
۲	ICCKE-1076	Joint ADC-less Analog Demodulator and Decoder for Extended Binary (8, 4, 4) Hamming Channel Code Mir Mahdi Safari - Jafar Pourrostam - Behzad Mozaffari Tazehkand	Mir Mahdi Safari
۳	ICCKE-1105	Sum Rate Analysis and Power Allocation in Massive MIMO Systems with Power Constraints Abdolrasoul Sakhaei Gharagezlou - Mahdi Nangir	Abdolrasoul Sakhaei Gharagezlou
۴	ICCKE-1178	Designing a High Perfomance and High Profit P2P Energy Trading System Using a Consortium Blockchain Network Poonia Taheri Makhsoos - Behnam Bahrak - Fattaneh Taghiyareh	Poonia Taheri Makhsoos

عنوان نشست: بینایی ماشین (MV5) روز و زمان نشست : ۲۷ آبان – ساعت ۱۴ رئیس نشست: دکتر اشکذری			
ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1145	Automated Person Identification from Hand Images\\using Hierarchical Vision Transformer Network Zahra Ebrahimian - Seyed Ali Mirsharji - Ramin Toosi - Mohammad Ali Akhaee	Zahra Ebrahimian
۲	ICCKE-1153	An Automated Visual Defect Segmentation for Flat Steel Surface Using Deep Neural Networks Dorna Nourbakhsh Sabet - Mohammad Reza Zarifi - Javad Khoramdel - Yasamin Borhani - Esmaeil Najafi	Mohammad Reza Zarifi
۳	ICCKE-1167	LPCNet: Lane detection by lane points correction network in challenging environments based on deep learning Sina BaniasadAzad - Seyed Mohammadreza Mousavi mirkolaei	Sina BaniasadAzad
۴	ICCKE-1188	Semantic Segmentation Using Region Proposals and Weakly-Supervised Learning Maryam Taghizadeh - Abdolah Chalechale	Maryam Taghizadeh

عنوان نشست: یادگیری ماشین (ML5)

روز و زمان نشست : ۲۷ آبان – ساعت ۱۴

رئیس نشست: دکتر حمیدزاده

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1081	Sensitivity Reliability Analysis of Power Distribution Networks Using Fuzzy Logic Mohammed Wadi - Wisam Elmasry - Ismail Kucuk - Hossein Shahinzadeh	Wisam Elmasry
۲	ICCKE-1098	Stock market prediction using multi-objective optimization Mahshid Zolfaghari - Hamid Fadishei - Mohsen Tajgardan - Reza Khoshkangini	Mahshid Zolfaghari
۳	ICCKE-1138	Taguchi Design of Experiments Application in Robust sEMG Based Force Estimation Mohsen Ghanaei - Hadi Kalani - Alireza Akbarzadeh	Mohsen Ghanaei
۴	ICCKE-1191	Load Frequency Control of Geothermal Power Plant Incorporated Two-Area Hydro-Thermal System with AC-DC Lines Shanker J Gambhire - Malligunta Kiran Kumar - Hossein Shahinzadeh - Mohammad-hossein Fayaz-dastgerdi - B. Srikanth Goud - Ch.Naga sai Kalyan	Shanker J Gambhire

عنوان نشست: مهندسی نرم افزار (SE5)

روز و زمان نشست : ۲۷ آبان – ساعت ۱۴

رئیس نشست: دکتر طاهری نیا

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1075	Degarbayan-SC: A Colloquial Paraphrase Farsi Subtitles Dataset Mohammad Javad Aghajani - Mohammad Ali Keyvanrad	Mohammad Javad Aghajani
۲	ICCKE-1127	SAT Based Analogy Evaluation Framework For Persian Word Embeddings Seyed Ehsan Mahmoudi - Mehrnoush Shamsfard	Seyed Ehsan Mahmoudi
۳	ICCKE-1132	InfOnto: An ontology for fashion influencer marketing based on Instagram Somaye Sultani - Mohsen Kahani	Somaye Sultani
۴	ICCKE-1142	PeQa: a Massive Persian Quenstion-Answering and Chatbot Dataset Fatemeh Zahra Arshia - Mohammad Ali Keyvanrad - Saeedeh Sadat Sadidpour - Sayyid Mohammad Reza Mohammadi	Fatemeh Zahra Arshia

عنوان نشست: شبکه کامپیوتری (CN5)
روز و زمان نشست : ۲۷ آبان – ساعت ۱۴
رئیس نشست: دکتر امین طوسی

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1074	Zone-Based Federated Learning in Indoor Positioning Omid Tasbaz - Vahideh Moghtadaiee - Bahar Farahani	Omid Tasbaz
۲	ICCKE-1086	P2DF: Privacy-Preserving Data Fusion Protocol Motahareh Dehghan - Erfan Khosravian - Zahra Golfar - Hossein Shahbazi	Motahareh Dehghan
۳	ICCKE-1126	Android Malware Detection using Supervised Deep Graph Representation Learning Fatemeh Deldar - Mahdi Abadi - Mohammad Ebrahimifard	Fatemeh Deldar
۴	ICCKE-1160	A Review on Secure Data Storage and Data Sharing Technics in Blockchain-based IoT Healthcare Systems Seyedeh Somayeh Fatemi Nasab - Davoud Bahrepour - Seyed Reza Kamel Tabbakh	Seyed Reza Kamel Tabbakh

عنوان نشست: بینایی ماشین (MV6)
روز و زمان نشست : ۲۷ آبان – ساعت ۱۷:۳۰
رئیس نشست: دکترجم پور

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1027	IR-LPR: Large Scale of Iranian License Plate Recognition Dataset Mahdi Rahmani - Melika Sabaghian - Seyyedeh Mahila Moghadami - Mohammad Mohsen Talaie - Mahdi Naghibi - Mohammad Ali Keyvanrad	Mahdi Rahmani
۲	ICCKE-1044	MultiPath ViT OCR: A Lightweight Visual Transformer-based License Plate Optical Character Recognition Alireza Azadbakht - Saeed Reza Kheradpisheh - Hadi Farahani	Alireza Azadbakht
۳	ICCKE-1092	Real-Time Vehicle Detection and Classification in UAV imagery Using Improved YOLOv5 Mohammad Hossein Hamzenejadi - Hadis Mohseni	Mohammad Hossein Hamzenejadi
۴	ICCKE-1139	Averting Mode Collapse for Generative Zero-Shot Learning Shayan Ramazi - Setare Shabani	Shayan Ramazi

عنوان نشست: یادگیری ماشین (ML6)

روز و زمان نشست : ۲۷ آبان – ساعت ۱۷:۳۰

رئیس نشست: دکتر غیاثی

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1108	GAP: Fault tolerance Improvement of Convolutional Neural Networks through GAN-aided Pruning Pouya Hosseinzadeh - Yasser Sedaghat - Ahad Harati	Pouya Hosseinzadeh
۲	ICCKE-1195	Intelligent Interpretation of Frequency Response Signatures to Diagnose Radial Deformation in Transformer Windings Using Artificial Neural Network Reza Behkam - Hossein Karami - Mehdi Salay Naderi - Gevork B. Gharehpetian	Reza Behkam
۳	ICCKE-1042	Deep Deterministic Policy Gradient in Acoustic To Articulatory inversion Farzane Abdoli - Hamid Sheikhzade - Vahid Pourahmadi	Farzane Abdoli
۴	ICCKE-1067	An Efficient Planning Method for Autonomous Navigation of a Wheeled-Robot based on Deep Reinforcement Learning Ali Salimi Sadr - Mahdi Shahbazi Khojasteh - Hamed Malek - Armin Salimi-Badr	Ali Salimi Sadr

عنوان نشست: معماری کامپیوتر (CA6)

روز و زمان نشست : ۲۷ آبان – ساعت ۱۷:۳۰

رئیس نشست: دکتر نوری

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1012	Low-Cost and Hardware Efficient Implementation of Pooling Layers for Stochastic CNN Accelerators Mobin Vaziri - Hadi Jahanirad	Mobin Vaziri
۲	ICCKE-1046	A Simple Low Cost Approach to Detect Hand Gesture Based on Software Event Camera Emulation Ali Sabet Akbarzadeh - Abedin Vahedian	Ali Sabet Akbarzadeh
۳	ICCKE-1137	Financial Market Prediction Using Deep Neural Networks with Hardware Acceleration Dara Rahmati - Mohammad Hadi Foroughi - Ali Bagherzadeh - Mehdi Foroughi - Saeid Gorgin	Dara Rahmati

عنوان نشست: شبکه کامپیوتری (CN6)

روز و زمان نشست : ۲۷ آبان – ساعت ۱۷:۳۰

رئیس نشست: دکتر حسینی

ردیف	کد مقاله	عنوان مقاله و نویسندگان	ارائه دهنده
۱	ICCKE-1110	Flying Base Station 3D Positioning, Considering Path Loss, Coverage Area, and QoS Constraints Afshin Alaghehband - Ghazal Bangash - Amirhossein Mohajerzadeh - Abedin Vahedian	Afshin Alaghehband
۲	ICCKE-1183	FAHP-OF: A New Method for Load Balancing in RPL-based Internet of Things (IoT) Mohammad Koosha - Behnam Farzaneh - Emad Alizadeh - Shahin Farzaneh	Mohammad Koosha
۳	ICCKE-1085	Optimal PMU Placement Considering Reliability of Measurement System in Smart Grids Mohammad Shahraeini - Shahla Khormali - Ahad Alvandi	Ahad Alvandi
۴	ICCKE-1192	A parallel CNN-BiGRU network for short-term load forecasting in demand-side management Arghavan Irankhah - Sahar Rezazadeh Saatlou - Mohammad Hossein Yaghmaee - Sara Ershadi-Nasab - Mohammad Alishahi	Sahar Rezazadeh Saatlou

لیست مقالات

در دوازدهمین کنفرانس ICCKE2022 ، ۱۹۴ مقاله توسط پژوهشگران ثبت شده بود که پس از داوری توسط ۲۲۷ داور و بعد از انجام مجموعا ۷۱۶ داوری، ۸۴ مقاله برای شرکت و ارائه در این کنفرانس پذیرفته شد. خلاصه این مقالات به شرح زیر می‌باشد:

ICCKE-1002, Early detection of Parkinson’s disease using Convolutional Neural Networks on SPECT images

Reyhaneh Dehghan – Shahid Chamran University of Ahvaz
Marjan Naderan – Shahid Chamran University of Ahvaz
Seyyed Enayatallah Alavi – Shahid Chamran University of Ahvaz

Parkinson’s Disease or PD, is a neurological disorder that mainly affects dopamine-producing neurons in a specific area of the brain namely, the substantia nigra. Despite the fact that this disease has been known for many years, accurate diagnosis of Parkinson's disease in its early stages still remains a challenge for physicians and researchers. In this study, a convolutional neural network (CNN) is used to diagnose the disease, which is able to differentiate between patients with Parkinson's disease from healthy individuals based on Single-Photon Emission Computed Tomography (SPECT) images. The proposed method consists of four phases: preprocessing, Data Augmentation, training and testing/evaluation. A total of 650 SPECT images were analyzed in this study, which were taken from the Parkinson's Progression Markers Initiative (PPMI) Database. Simulation results compared with other classification methods, show an accuracy of 97.01%, recall of 96.61%, specificity of 96.61%, and an f1-score of 96.61%. In addition, to improve the results, data augmentation is added to the method to increase the number of sample images. Results of adding data augmentation also show an accuracy of 95.50%, recall of 98.88%, specificity of 97.82%, and an f1-score of 98.32%, which are promising compared to previous work.

ICCKE -1005, A Hybrid Echo State Network for Hypercomplex Pattern Recognition, Classification, and Big Data Analysis

Mohammad Jamshidi – University of West Bohemia
Fatemeh Daneshfar – University of Kurdistan

Processing big data with high-dimensional forms is one the most challenging parts of analyzing different signals and systems for various applications, including decisionmaking, pattern recognition, classification, etc. This procedure can be more problematic when interpreting and modeling complex phenomena. On the other hand, the processing speed in machine learning (ML) methods may not be acceptable, especially for real-time implementations. In other words, the more accurate a signal is, the more latency can occur. Recently, echo state networks (ESN) have shown appropriate precession in signal processing and classifying variables. However, utilization of a reservoir layer affects their speed, particularly for high-dimensional data. This paper presents a powerful ESN method for pattern recognition and classification of complex phenomena based on a new octonion ESN called octonion nonlinear ESN (ONESN). This method includes a modified version of the conventional ESN, in which all computations from the real space are mapped to the octonion space. Consequently, the size of the reservoir and its weights are reduced to 1/8 of its initial amount, increasing the speed of processing. Also, a bilinear filter to improve the performance of the conventional ESN is added to the output of the network.

ICCKE -1007, Robustness Scan of Digital Circuits Using Convolutional Neural Networks

Mobin Vaziri – University of Kurdistan
Mohammad Mehdi Rahimifar – Université de Sherbrooke
Hadi Jahanirad – University of Kurdistan

Hardware Trojan (HT) is a crucial problem in the integrated circuits and digital systems industry, which has many malicious impacts on circuits such as overheating, functionality changes, and information leakage. Although many detection methods have been studied to detect HTs in circuits, a comprehensive vulnerability analysis of digital circuits to HTs has not been investigated yet. This paper presents a novel digital circuits vulnerability analysis to HTs using convolutional neural networks (CNN) with high accuracy. First, we scrutinize vulnerable factors in circuits, and we generate vulnerability heat maps in circuits' regions. Then, an appropriate neural network architecture is designed. Finally, we employ neural networks to classify different regions vulnerability level. With our approach, vulnerable regions of digital circuits can be classified with 92.5% average accuracy.

ICCKE -1009, Design and Simulation of a Low PDP Full Adder by Combining Majority Function and TGDI Technique in CNTFET Technology

Mahsa Mohammadi – Department of Electrical Engineering

In this study, a full adder based on the transmission gate diffusion input (TGDI) technique and majority function is presented in carbon nanotube field-effect transistor (CNTFET) technology. The proposed design consists of 18 transistors and is simulated using HSPICE software at a voltage of 0.8 V, a frequency of 500 MHz, and a load capacitance of 1 fF in 32 nm technology. The simulation results show the reasonable performance of the sum and carry output signals as well as the improvement in power consumption, latency, power-delay product (PDP), and energy-delay product (EDP). The power consumption and delay of the proposed design are, respectively, 697 nW and 13.8 ps, which result in a PDP of 9.67 fJ and an EDP of 1.34 × 10 - 28 Js.

ICCKE -1012, Low-Cost and Hardware Efficient Implementation of Pooling Layers for Stochastic CNN Accelerators

Mobin Vaziri – University of Kurdistan
Hadi Jahanirad – University of Kurdistan

With the astonishing achievements of Convolutional Neural Network (CNN) accelerators in real-time applications, the deployment of CNNs on hardware has become an attractive matter. Pooling layers in CNNs are employed for reducing the computation of convolutional layers. Nevertheless, their hardware implementation strategy can impact the accuracy and performance of accelerators. This paper presents a novel parallel Stochastic Computing (SC) based architecture of pooling modules in hardware for stochastic CNN accelerators. With this approach, the SC-based average pooling is reconfigurable with 1.28 times lower power consumption, and the max pooling layer achieves area reduction with the ratio of 4.36. Increasing the accuracy and extending the application of stochastic CNN accelerators in different classification problems is also achieved by implementing AAD pooling with the proposed method.

ICCKE-1021, DevRanker: An Effective Approach to Rank Developers for Bug Report Assignment

Mohammad Reza Kardoost – Department of Computer Science, Engineering, and IT, Shiraz University, Shiraz, Iran
Mohammad Reza Moosavi – Department of Computer Science, Engineering, and IT, Shiraz University, Shiraz, Iran
Reza Akbari – Department of Computer Engineering and Information Technology, Shiraz University of Technology, Shiraz, Iran

Bug assignment, which routes software projects' bug reports to the appropriate fixers, is an important part of software development and maintenance. Manual bug assignment is a time-consuming process that delays debugging. So various machine learning and information retrieval approaches have been used for automating the bug assigning process. However, Most previous deep learning-based studies have focused on developers assigned to bug reports and have not specifically considered developers' collaboration and interaction to resolve bug reports. In this paper, we present a new automatic bug assignment approach based on Bidirectional Encoder Representations from Transformers (BERT) and Preference Neural Network (PNN). First, we preprocess the textual data in the bug reports. Second, we use BERT as a word embedding technique to get vector representation of bug reports. Third, we calculate the developers' suitability score based on different developers' activity features for each bug report. Finally, PNN is used to rank developers for each bug report. Experiments are performed on open-source projects, namely Eclipse UI, Birt, JDT and SWT, and top-k accuracy is measured as an evaluation metric. The experimental results show that our approach can effectively improve the performance of automatic bug assignment.

ICCKE-1024, Attention Transfer in Self-Regulated Networks for Recognizing Human Actions from Still Images

Masoumeh Chapariniya – School of Electrical Engineering, Iran University of Science and Technology
Sara Vesali Barazande – School of Electrical Engineering, Iran University of Science and Technology
Seyed Sajad Ashrafi – School of Electrical Engineering, Iran University of Science and Technology
Shahriar B.Shokouhi – School of Electrical Engineering, Iran University of Science and Technology

Human action recognition in still images (HAR) is a challenging computer vision task owing to problems such as lack of temporal information and large intra-class variations, cluttered backgrounds, and misleading objects which requires highly discriminative features. Transfer learning algorithms such as knowledge distillation and attention transfer techniques offer the necessary abilities in producing informative features by preserving prior knowledge while learning new representations. Because The ResNet and its variants have made significant advances in computer vision, most research to date focused on knowledge distillation and attention transfer in this architecture. Recently, self-regulated networks based on regulator module have been introduced that perform better than ResNet networks in various computer vision tasks. In this article, we propose the attention transfer framework in self-regulated networks for human action recognition in still images. We conduct extensive experiments on Stanford 40 and Pascal Voc 2012 Action datasets to investigate the performance of the proposed framework. The best setting of our method gains 93.17% (in terms of mAP) on Stanford40 dataset and 91.83% (in terms of mAP) on Pascal Voc 2012 Action datasets. Experiments demonstrate that attention transfer framework in self-regulated networks with extraction more representative and informative features through regulator module based on memory mechanism and without using any auxiliary data such as personal bounding box, objects bounding boxes, and human-object interactions has been able to significantly improve the action recognition in still images.

ICCKE-1025, Crack Segmentation in Civil Structure Images Using a Deep Learning Based Multi-Classifier System

Mohammadreza Asadi – Electrical Engineering Department, Yazd University
Seyedeh Sogand Hashemi – Electrical Engineering Department, Yazd University
Mohammad Taghi Sadeghi – Electrical Engineering Department, Yazd University

In civil structures, cracks are one of the initial signs of structure deterioration. Therefore, structural cracks identification is an essential task for structures maintenance. In this framework, automatic inspection of structures is a suitable replacement to the manual approaches. These automatic methods are mainly based on computer vision techniques which has had a growing interest in last decades. Crack segmentation is similar to edge detection problems; thus, it could be solved by edge detection methods. In this paper, cracks in civil structures such as concretes and pavements are segmented by a Convolutional Neural Network (CNN) based multi-classifier system which applies pixel-wise segmentation on images of cracks. The dataset we have used made of 537 three channel images with manual annotation maps. The final results claims that the proposed method with F-score of 86.8, has good performance which is superior compared to holistically-nested networks like HED and DeepCrack.

ICCKE-1026, Soccer Video Event Detection Using Metric Learning

Ali Karimi – University of Tehran
Ramin Toosi – University of Tehran
Mohammad Ali Akhaee – University of Tehran

This paper addresses the problem of event detection in soccer videos. We Introduced a new dataset named SoccerEvent. SoccerEvent is a video dataset for event detection in soccer. Also, we present a new architecture based on a convolutional neural network (CNN)-gated recurrent unit (GRU) for event detection in soccer. The proposed method employs metric learning with contrastive loss. The proposed method is evaluated using SoccerNetV1 and SoccerEvent Datasets. Results show that the proposed method outperforms state-of-the-art methods in terms of accuracy.

ICCKE-1027, IR-LPR: Large Scale of Iranian License Plate Recognition Dataset

Mahdi Rahmani – Malek Ashtar University of Technology
Melika Sabaghian – Malek Ashtar University of Technology
Seyyedeh Mahila Moghadami – Malek Ashtar University of Technology
Mohammad Mohsen Talaie – Malek Ashtar University of Technology
Mahdi Naghibi – Malek Ashtar University of Technology
Mohammad Ali Keyvanrad – Malek Ashtar University of Technology

Object detection has always been practical. There are so many things in our world that recognizing them can not only increase our automatic knowledge of the surroundings, but can also be lucrative for those interested in starting a new business. One of these attractive objects is the license plate (LP). In addition to the security uses that license plate detection can have, it can also be used to create creative businesses. With the development of object detection methods based on deep learning models, an appropriate and comprehensive dataset becomes doubly important. But due to the frequent commercial use of license plate datasets, there are limited datasets not only in Iran but also in the world. The largest Iranian dataset for detection license plates has 1,466 images. Also, the largest Iranian dataset for recognizing the characters of a license plate has 5,000 images. We have prepared a complete dataset including 20,967 car images along with all the detection annotation of the whole license plate and its characters, which can be useful for various purposes. Also, the total number of license plate images for character recognition application is 27,745 images.

ICCKE-1031, The Effect of Network Environment on Traffic Classification

Abolghasem Rezaei Khesal – University of Tehran
Mehdi Teimouri – University of Tehran

One of the challenges of network traffic classification and mobile app identification is model generalization. The accuracy and efficiency of classification models are strongly influenced by the network environment and user behavior. By changing the network environmental parameters such as mobile type or app version, the accuracy of the trained classification model may be reduced. In this paper, we investigate the effect of the network environment on one of the most well-known networks traffic classifiers. To this end, we have collected a dataset of 60 popular apps in Iran using different network environments.

ICCKE-1038, IranITJobs2021: a Dataset for Analyzing Iranian Online IT Job Advertisements Collected Using a New Crowdsourcing Process

Fakhroddin Noorbehbahani – University of Isfahan
Nikta Akbarpour – University of Isfahan
Mohammad Reza Saeidi – University of Isfahan

Gathering and preparing high-quality data is one of the most significant and expensive steps in data analytics. Crowdsourcing is an efficient way to create datasets for machine learning and data science applications. However, it is vital to apply a proper crowdsourcing process for dataset creation to ensure the quality of the collected data. To our best knowledge, there is no crowdsourcing process specially designed for dataset collection. In this paper, a new process to create high-quality datasets based on crowdsourcing is proposed, including pre-gathering, gathering, and post-gathering phases. Today employers and job seekers benefit from online job postings and social media sites for recruitment more than ever before. Consequently, a huge volume of job posting data is available that enforces the need for data visualization and data analytics for extracting valuable insights to help better decision making. Although there exist several online job advertisement datasets for analyzing job demand and requirements, there is no such dataset about the IT job market in Iran. In this paper, IranITJobs2021, an online IT job posting dataset, is presented, which is produced using the proposed dataset collection process. IranITJobs2021 includes job advertisements related to information technology from August 2019 to January 2021. The dataset incorporates 1300 instances and 13 features which is publicly available. IranITJobs2021 could be analyzed to find valuable patterns of job requirements and skills in the field of information technology. Furthermore, the proposed dataset collection process is applicable to create datasets efficiently.

ICCKE-1040, Improving performance of multi-label classification using ensemble of feature selection and outlier detection

Mohammad Ali Zarif – Sadjad University
Javad Hamidzadeh – Sadjad University

Nowadays classification has become one of the most common techniques in machine learning. In classification, there are two types of data; single-label and multi-label. In multi-label datasets, one sample can have multiple labels at the same time. In recent years, classification of multi-label data has gained a lot of attention. Multi-label classification algorithms can be divided into 3 main parts: problem transformation methods, algorithm adaptation methods and ensemble methods. In problem transformation methods, classification of multi-label data is transformed to other fields. In algorithm adaptation methods, common single-label classification algorithms are changed so that they can deal with multi-label data. In third category, algorithms of two previous categories are combined together. Despite of many different proposed algorithms in this field, improvement of methods in terms of evaluation metrics has always been a challenge. Also, there is a lack of systems which can self-improve the base classifier. Thus, in this paper we try to present a novel ensemble system which can improve any classifier. The presented system has a novel structure which consists of two tree ensembles and each one has its own specific function. One of them has the task of removing noisy and outlier data with a novel approach and the other one has the task of removing noisy and redundant features. In one group some random samples are selected and in the other one, some random features are selected. If the evaluation metrics of the created child are improved, the algorithm can go to the next step and create its own child and if not, the parents create another child. Lastly, the results of these groups are combined together. The conducted experiments on 10 various datasets and 5 evaluation metrics show the superiority of the proposed method.

ICCKE-1042, Deep Deterministic Policy Gradient in Acoustic To Articulatory inversion

Farzane Abdoli – Amirkabir university of technology
Hamid Sheikhzade – Amirkabir university of technology
Vahid Pourahmadi – Amirkabir university of technology

This paper aims to utilize a deep reinforcement learning algorithm for the acoustic-to-articulatory inversion problem. A deep deterministic policy gradient (DDPG) based method is adopted to adjust the articulatory parameters of a speaker to minimize the cepstral difference between original speech and the synthesized one. In traditional methods such as NNs, GMMs,... , parallel acoustic and articulatory training data is needed for each speaker, but the proposed iterative DDPG is used to explore articulatory space for finding the best point, which maximizes the desired reward without any need for joint kinematic and articulatory data for the speaker. Acoustic signals are synthesized by VocalTractLab (VTL), a three-dimensional articulatory synthesizer, and represented by Mel-frequency cepstral coefficients (MFCCs). This method provides estimated parameters very close to the ones which are calculated by MRI and advanced processing.

ICCKE-1043, Improved TrustChain for Lightweight Devices

Seyed Salar Ghazi – Ferdowsi university of Mashhad
Haleh Amintoosi – Ferdowsi university of Mashhad

In recent years, Blockchain technology has been used in many fields, including Machine Learning, Cloud Computing, and the Internet of Things (IoT). Integrating Blockchain and IoT with its lightweight devices has benefits such as enhanced security and reduced costs. In this field, critical challenges that need to be addressed are providing security and performance guarantees. An available solution to meet the mentioned challenges is TrustChain. Unlike conventional Blockchains, TrustChain does not have a single global chain. Instead, each node is responsible for building and maintaining its own local chain. With all the benefits, TrustChain is vulnerable to the Whitewashing attack. Moreover, once a fatal error occurs, the recovery time of each TrustChain node is considerably high. In this paper, we propose a solution to address the above-mentioned attack by the implementation of a smart contract-based authentication system on top of TrustChain. Moreover, we connected the TrustChain to a distributed cloud (i.e., IPFS), with the aim of significantly reducing the recovery time of nodes (up to 90%) in the fatal errors. Finally, we evaluate improved TrustChain with PoW Blockchains simulator (As the most secure and basic Blockchain) from two aspects of security and performance for lightweight devices and prove that the improved TrustChain propagation delay is less than a PoW Blockchain and it is more secure than PoW systems against main attacks.

ICCKE-1044, MultiPath ViT OCR: A Lightweight Visual Transformer-based License Plate Optical Character Recognition

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Because of natural conditions of license plates images, the Optical Character Recognition (OCR) of these images is generally a challenging problem, and it is utilized in edge devices with limited computation power. Despite the considerable progress of deep neural networks, the state-of-the-art models are not always a good solution for this problem. Most of the models have a large number of parameters and in practice, they need a lot of resources to train, maintain and implement on edge devices. We propose a lightweight model based on Visual Transformer architecture and we achieve competitive results against traditional CRNN models, due to the lack of a rich and large scale dataset for Persian license plates we gather and annotate 1.3M images of license plates in various natural conditions from a different point of views and different cameras. We call this dataset as LicenseNet. Our proposed model achieves 77.25% accuracy against CNN models with 75.18% accuracy and embedded OCR models in cameras with 60.37% accuracy on the LicenseNet test set. Furthermore, we achieved better accuracy with 3.21 times fewer number of training parameters in comparison to previously proposed models.

ICCKE-1046, A Simple Low Cost Approach to Detect Hand Gesture Based on Software Event Camera Emulation

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In this paper a simple and low-cost approach is presented for detection of hand gestures and solid object extraction based on software emulated Event Camera (DVS) to be used on system on chips (SOC) and embedded systems. The proposed approach is based on using classic and filter algorithms with minimum overheads together with a simple NN and CNN utilized to extract gesture.

ICCKE-1049, Multi-Task Transformer for Stock Market Trend Prediction

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This paper presents a novel stock market prediction method by taking transformers' advantages in analyzing the sequential data. The previous techniques usually tend to learn/understand the pattern of the market by analyzing the historical market data, while those patterns are very complex and implicit. To learn these patterns effectively, we cope with this challenge by leveraging deep neural models, i.e., transformers. We employ transformers to predict the stock trend. Since this kind of deep learning model needs a massive amount of data to be trained, the data paneling approach is hired to extend the dataset. Also, the multi-task technique is utilized to reduce the optimization searching space, which causing to speeding up the coverage and finding relatively optimal parameters and consequently improved accuracy. Note that the method of labeling the trend which is used in this paper is financially meaningful and more practical. We have evaluated the performance of our proposed method on the real-world stock market, specifically the Iran stock market. The results confirm the effectiveness of our proposed model.

ICCKE-1049, TCAR: Thermal and Congestion-Aware Routing Algorithm in a Partially Connected 3D Network on Chip

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3D Network-on-chip architecture outperforms 2D ones in terms of area and latency. Layers in 3D NoC are connected by Through-Silicon Via (TSV), which imposes high implementation cost. Partially connected 3D NoCs are introduced to overcome this challenge. On the other hand, thermal issue and congestion are the main challenges in 3D NoCs. High temperature leads to aging which creates permanent and transient defects and reduces the reliability. Congestion issue can also reduce NoC performance and exaggerate the thermal challenges. In this paper, we presents a partially connected 3D NoC, in which a two-step routing algorithm is proposed based on the thermal and congestion weight coefficient assignment. The packets are routed due to the distance of the layers from the heat sink and network congestion status to select optimum path. The simulation results indicate 48% performance improvement compared to the recent partially-connected routing algorithms.

ICCKE-1051, Pyramid Transformer for Traffic Sign Detection

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Traffic sign detection is a vital task in the visual system of self-driving cars and the automated driving system. Recently, novel Transformerbased models have achieved encouraging results for various computer vision tasks. We still observed that vanilla ViT could not yield satisfactory results in traffic sign detection because the overall size of the datasets is very small and the class distribution of traffic signs is extremely unbalanced. To overcome this problem, a novel Pyramid Transformer with locality mechanisms is proposed in this paper. Specifically, Pyramid Transformer has several spatial pyramid reduction layers to shrink and embed the input image into tokens with rich multi-scale context by using atrous convolutions. Moreover, it inherits an intrinsic scale invariance inductive bias and is able to learn local feature representation for objects at various scales, thereby enhancing the network robustness against the size discrepancy of traffic signs. The experiments are conducted on the German Traffic Sign Detection Benchmark (GTSDB). The results demonstrate the superiority of the proposed model in the traffic sign detection tasks. More specifically, Pyramid Transformer achieves 77.8% mAP on GTSDB when applied to the Cascade RCNN as the backbone, which surpasses most well-known and widely-used state-of-the-art models.

ICCKE-1058, MCRS-SAE: multi criteria recommender system based on sparse autoencoder

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Due to the big amount of information in today's world, recommender systems are used to help users reach the things that are most similar to their tastes. Compared to traditional recommender systems, Multi criteria recommender systems, consider several minor criteria instead of a general criterion, which cause predictions to be more similar to contents target user's preferences. But high dimension and sparsity of data is always one of the main problems that reduce the quality of predictions. It has also been observed in recent years that the use of deep learning techniques in the field of recommender systems has increased quality of predictions. In addition, some criteria have more priority for the user during selecting item. In this paper, we propose a multi criteria recommender system using the sparse auto encoder (MCRS_SAE) to improve problem of sparsity of data and also use radial basis function kernel (RBF kernel) to determine the weight of the criteria. Experiments on the Yahoo! Movies and TripAdvisor multi-criteria datasets show that our proposed method in presenting personal predictions has better performance compared to other presented methods.

ICCKE-1060, Segmentation of Hard Exudates in Retinal Fundus Images Using BCDU-Net

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The importance of Diabetic Retinopathy (DR) screening and the difficulty in achieving an early diagnosis of DR at a reasonable cost requires attention to the development of computer-aided diagnostic tools. Computer-Aided Diagnosis (CAD) of retinal detachment imaging can reduce mass screening of the diabetic population and help physicians make the best use of their time. For this purpose, the deep learning technique and the developed U-Net canonization network have been used. Using this network, it receives retinal images and shows the segmentation of the hard exudate lesion as a binary image. The result of this research has been evaluated on the IDRID dataset with three important indicators of dice coefficient, sensitivity, and accuracy achieve at 76.81%, 72.24%, and 99.30%, respectively, and the effectiveness of the approach was confirmed.

ICCKE-1066, A Rule-Based Language for Configurable N-way Model Matching

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To build complex software-intensive systems, different stakeholders from diverse domains must collaborate to create and modify models. Model matching is a fundamental precondition of collaborative development, which is concerned with identifying common elements in input models. When stakeholders work on multiple models, they need to simultaneously compare all models to better understand differences and similarities. However, the literature shows no consensus on how to specify comparison criteria for matching multiple models, especially in a form that is independent from modeling language, which hampers their reuse and adoption. In this paper, we present a rule-based formalism that enables the user to specify their comparison criteria for multiple models at a high level of abstraction. We also introduce an N-way matching algorithm for comparing both homogeneous and heterogeneous models. As the tool support, we implemented a syntax-aware editor and a parser for specifying comparison rules for EMF-based models. The evaluation of our formalism shows that it is applicable in real modeling scenarios.

ICCKE-1067, An Efficient Planning Method for Autonomous Navigation of a Wheeled-Robot based on Deep Reinforcement Learning

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Hamed Malek – Shahid Beheshti University
Armin Salimi-Badr – Shahid Beheshti University

In this paper, a planning method to autonomously navigate a wheeled-robot based on deep reinforcement learning is proposed. The planning algorithm aims at reaching a predetermined target configuration while avoiding obstacles. It is assumed that the robot chassis is differential-drive and it is equipped with multiple distance sensors to perceive the environment and Global Positioning System (GPS) for localization. A Deterministic Actor-Critic model is designed to navigate the robot in an environment including multiple obstacles. Since navigation is a multi-objective optimization problem, a novel reward function considering different contradicted criteria including reaching the target and avoiding the obstacles is proposed in this paper. To improve the performance and convergence of the learning method, a gradual learning method is applied to first learn target reaching and next obstacle avoidance. The effect of the proposed reward function is compared with some other reward functions to show its effectiveness.

ICCKE-1068, Dual Memory Structure for Memory Augmented Neural Networks for Question-Answering Tasks

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Memory is crucial for machine learning tasks on sequential data. From vanilla RNN to LSTM and memory augmented neural networks, researchers have investigated several types of memory structures. However, they suffer from limitations in the capacity or ability to keep track of long-term dependencies. This paper presents an external memory module composed of two distinct submodules that are inspired by memory in the human brain. Besides, a sleep mechanism is incorporated into this memory, which can mimic sleep's effects on improving human memory. The proposed method is fully differentiable; thus, backpropagation can be used for its training. Experiments conducted on the bAbI dataset show that the proposed method is successful in 16 out of 20 tasks, and the average error is 2.8%. The performance of the proposed method is far better than the conventional NTM, and it has the lowest prediction error in 7 out of 20 tasks among baseline systems. Besides, the proposed system is the only system that can solve tasks 16 and 17 of the bAbI dataset.

ICCKE-1070, Deep Inside Tor: Exploring Website Fingerprinting Attacks on Tor Traffic in Realistic Settings

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In recent years, with the new advances in the areas of machine learning, Tor's advertised anonymity has been widely threatened. Despite all the protection mechanisms employed by Tor, attackers can now draw inferences on the online activities of a Tor user. Although such an study is critical for users of Tor, most of the existing works in this regard are based on unrealistic assumptions and settings. In this work, we explore the effectiveness of fingerprinting attacks under realistic settings. We focus on identifying the target websites and applications visited or used by a Tor user, through analyzing the heavily encrypted traffic that any local eavesdropper can also see. Unlike existing works, we focus on small groups of consecutive packets, which allows us to study more complex user behavior. By modifying our Tor client to label the Tor cells with the name of the destined application or website name, could label the packets even when multiple websites and applications were simultaneously using the Tor proxy. To label the network packets, the byte sequence of a labeled cell was located inside the packets, which, to the best of our knowledge, is the most accurate way for labeling the packets. In this way, we accomplished to gather an extensive dataset of Tor traffic, corresponding to different types of user's behavior. Finally, we proposed several deep neural network structures to classify the packets of different websites and analyzed the effectiveness of Tor's encryption methods in

realistic settings by achieving an accuracy of 3% in classifying 100 different websites. The results show the effectiveness of Tor's multi-layer encryption scheme.

ICCKE-1071, Cross-project Defect Prediction with An Enhanced Transfer Boosting Algorithm

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A growing number of software projects makes it increasingly crucial to predict software defects. If sufficient historical data is available, within-project defect prediction models can be effective. During the early stages of software development, however, insufficient data exists to train an effective predictor. Cross-project defect prediction (CPDP) uses information from previous mature projects (source data) to predict whether new software modules (target data) will be defective. CPDP models must take into account the fact that data distributions between target and source projects are different. These models often reduce distribution differences by either selecting training data or using transfer learning methods. Using transfer learning effectively reduces distribution differences in recent CPDP models. Yet none of them have taken into account the possibility that negative transfer may occur as a result of imbalanced nature of defect data. In this paper, a four-step model is proposed, of which three steps are dedicated to the preparation of training data and their initial weights for using in the fourth step, which involves an enhanced version of the transfer boosting algorithm. In this algorithm imbalance nature of data is considered and the weighting of the source data is updated to enhance the prediction performance. Therefore, aside from reducing distribution differences between source and target data, the model also addresses issues related to defect data class imbalance. As compared to four state-of-the-art CPDP models, this model provided consistent and accurate predictions for fifteen projects from PROMISE, AEEEM, and SOFTLAB. Our proposed model provided the best average results for both AUC and F-measure and in some datasets, the improvements were more than 5%.

ICCKE-1074, Zone-Based Federated Learning in Indoor Positioning

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With the advancement of artificial intelligence (AI), indoor positioning systems have been getting more attention in smart cities and smart homes for various purposes. However, protecting the privacy of users is one of the significant challenges in all smart environments. In very recent years, federated learning (FL) has been introduced as a solution for a privacy-aware indoor positioning system. However, there is still a risk of information leakage when transferring the model gradients between the clients and the central server in the federated learning process.

In this paper, to avoid revealing the location information of users, we propose a zone-based federated learning method that employs FL to determine the zone of the users instead of their exact location. Therefore, even with the leakage of model gradients, the users' exact location cannot be determined; thus, their privacy is preserved. We verified the suggested method utilizing two real datasets and compared the results with the non-FL mode. Also, The accuracy of the proposed method is evaluated in various number of communication rounds, number of clients, and number of data for each client. The results on both datasets indicate that while the proposed method preserves the privacy of clients, the accuracy of that is very close to the accuracy of the non-FL mode.

ICCKE-1075, Degarbayan-SC: A Colloquial Paraphrase Farsi Subtitles Dataset

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Paraphrase generation and paraphrase detection are important tasks in Natural Language Processing (NLP), such as information retrieval, text simplification, question answering, and chatbots. The lack of comprehensive datasets in the Persian paraphrase is a major obstacle to progress in this area. In spite of their importance, no large-scale corpus has been made available so far, given the difficulties in its creation and the intensive labor required. In this paper, the construction process of Degarbayan-SC using movie subtitles, together with some of the difficulties we experienced during data extraction and sentence alignment, is addressed. As you know, movie subtitles are in Colloquial language. It is different from formal language. To the best of our knowledge, Degarbayan-SC is the first freely released large-scale (in the order of a million words) Persian paraphrase corpus. Furthermore, this newly introduced dataset will help the growth of Persian paraphrase. We have tested our dataset on neural network models and compared the performances of different attention-based models (transformers) and the GRU model on it. We have also declared the sentences generated by the neural networks and performed human metrics on them.

ICCKE-1076, Joint ADC-less Analog Demodulator and Decoder for Extended Binary (8, 4, 4) Hamming Channel Code

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Since parameters such as bandwidth, power, and cost have an undeniable essential role in the performance of communication systems, designing new methods to improve the performance of systems, including designing suitable methods for demodulation and decoding, has always been considered by researchers. Utilizing millimeter-wave (mm-wave) frequency bands and, by nature, multi-gigabit per-second wireless communications pose challenges in implementing an analog-to-digital converter (ADC) to achieve high data rates in terms of extremely high power consumption. This paper proposes a joint ADC-less scheme for implementing the analog demodulation and decoding of extended (8, 4, 4) Hamming codes. Our proposed scheme is based on amplitude threshold estimation and phase detection and subjoins two decoding and demodulation blocks.

ICCKE-1077, Recommending Popular Locations Based on Collected Trajectories

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Data gathered from location-aware devices, such as GPS, create opportunities for researchers to extract interesting information from the movement of objects. Popular places are regions that are visited for long durations of time or by a large number of objects. For human trajectories, such popular places are of interest in location recommender systems. In this paper, a number of input trajectories are preprocessed to efficiently answer queries about popular places. Each query specifies one potential popular place and the minimum and maximum duration of a visit. The answer to any such query is the number of visits to the corresponding popular place. We present algorithms for this problem and experimentally evaluate them on real-world data sets. One advantage of the algorithms presented in this paper for location recommender systems is that, unlike most of them, it works even when social network databases are unavailable or unreliable.

ICCKE-1081, Sensitivity Reliability Analysis of Power Distribution Networks Using Fuzzy Logic

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This paper proposes a combined method utilizing both the reliability block diagram analytical technique and the Monte Carlo simulation method to estimate the reliability of power systems. Since the reliability collected data are associated with noise and erroneous data, performing the sensitivity analysis is indispensable. Sensitivity analysis utilizing fuzzy logic specifies these uncertainties and their effects on the reliability calculations. The proposed method is applied to the Roy Billiton Test System Bus-2 to confirm its applicability. The obtained results have verified the sensitivity analysis's importance in drawing the accurate picture of reliability evaluation and a crucial tool for distribution power utilities to identify the susceptible parameters that seriously erode the system's complete reliability.

ICCKE-1083, Persis: A Persian Font Recognition Pipeline Using Convolutional Neural Networks

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What happens if we see a suitable font for our design work but we do not know its name? Visual Font Recognition (VFR) systems are used to identify the font typeface in an image. These systems can assist graphic designers in identifying fonts used in images. A VFR system also aids in improving the speed and accuracy of Optical Character Recognition (OCR) systems. In this paper, we proposed the first publicly available datasets in the field of Persian font recognition and employed Convolutional Neural Networks (CNN) to address the Persian font recognition problem. The results show that the proposed pipeline obtained 78.0% top-1 accuracy on our new datasets, 89.1% in the IDPL-PFOD dataset, and 94.5% in the KAFD dataset. Furthermore, the average time spent in the entire pipeline for one sample of our proposed datasets is 0.54 and 0.017 seconds for CPU and GPU, respectively. We conclude that CNN methods can be used to recognize Persian fonts without the need for additional pre-processing steps such as feature extraction, binarization, normalization, etc.

ICCKE-1085, Optimal PMU Placement Considering Reliability of Measurement System in Smart Grids

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State estimation has been known as the major part of power system operation, and observability analysis is the main function in an estimator. Therefore, the placment of measurement devices for the observability of the entire network has always been the main concern, while the reliability of the estimator is an important issue that also should be considered. The current study presents a method for PMU placement that designs a highly reliable estimator with a minimum number of such units. This can be achieved by using a weighted adjacency matrix, which utilizes reliability of transmission lines as its weights, and well-defined objective function that tries to maximize reliability of estimator. The simulation results for the IEEE 14 and 24 bus test networks show that the proposed method not only minimizes the number of PMUs but also places such units on the branches with higher reliability.

ICCKE-1086, P2DF: Privacy-Preserving Data Fusion Protocol

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In IoT environments, a large amount of heterogeneous data is generated from different devices in a short time. In all applications of IoT, data quality is important in decision-making. Data fusion is an approach to increase the quality of data collected from different sources and decrease the amount of wrong and conflicting data. Collecting data from different sources and fusing them has many benefits. However, there is concern about privacy violations for data owners. Designing a privacy-preserving protocol for data fusion is important. So far, no protocol has been provided for private data fusion.

In this paper, we propose a private protocol for data fusion in IoT environments based on DFIOT approach. The computational and communication complexity of our proposed protocol is in order of n. We prove the security of our proposed protocol based on the real-ideal simulation paradigm. Also, we consider the problem of achieving security in the presence of semi-honest parties and adversaries.

ICCKE-1088, Extreme Gradient Boosting (XGBoost) Regressor and Shapley Additive Explanation for Crop Yield Prediction in Agriculture

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The primary purpose of precision agriculture is to maximize crop yields while utilizing a limited amount of land resources. Apart from industrialization, which fuelled Malaysia's significant economy and development, the country's agriculture industry performs a major role in guaranteeing food security and safety, as well as long-term development and wealth creation. The nation's policymakers must rely on reliable crop yield predictions to acquire easy export and import evaluations to improve national food security. Machine Learning can help anticipate yields more accurately. This paper proposes to use the XGBoost model for annual crop yield prediction in Malaysia. Experiments on the generated yield dataset shows promising results with 0.98 R-Squared value and outperformed the state-of-art models. The performance of the proposed model is extensively analyzed using the Shapley Additive Explanation (SHAP) to identify the important attributes in the crop yield prediction. The predictions provided by machine learning algorithms will aid farmers in deciding what to grow because of this research.

ICCKE-1089, Word-level Persian Lipreading Dataset

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Lip-reading has made impressive progress in recent years, driven by advances in deep learning. Nonetheless, the prerequisite such advances is a suitable dataset. This paper provides a new in-the-wild dataset for Persian word-level lip reading containing 244,000 videos from approximately 1,800 speakers. We evaluated the state-of-the-art method in this field and used a novel approach for word-level lip reading. In this method, we used the AV-Hubert model for feature extraction and obtained significantly better performance on our dataset.

ICCKE-1092, Real-Time Vehicle Detection and Classification in UAV imagery Using Improved YOLOv5

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Recently, Unmanned Aerial Vehicles (UAV) have become useful for various applications. In some real world applications such as UAV based traffic surveillance or disaster management, real-time vehicle detection and classification is an important task. However, vehicles appear too small in aerial UAV imagery which reduces detection accuracy. While modern UAVs are capable of recording high resolution videos with higher spatial information, increasing input size reduces inference speed. So making balance between the accuracy and inference speed is a challenge. In this paper, we address this challenge by proposing an improved version of YOLOv5 single stage object detector, make it suitable for detecting small objects in high resolution images. At the same time, we modified the network width and depth to make it suitable for real-time applications that requires high inference speed.

Experiments conducted on VisDrone and CARPK datasets confirm that compared to baseline YOLOv5 models, the proposed model has 3.7\% higher mAP50 and 6.1 FPS higher inference speed on VisDrone dataset while its size is 44.6 MB less than YOLOv5L size. These results confirm the efficacy of the proposed modifications applied on YOLOv5 to make a balance between accuracy and inference time.

ICCKE-1093, Fatty Liver Level Recognition Using Particle Swarm Optimization (PSO) Image Segmentation and Analysis

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Fatty liver or liver hepatic glycogen is one of the most common disorders of liver, nowadays. Clinical detection of this disorder by human expert is increasing as our lifestyle leads us toward this phenomenon. So, making a fast and robust expert system for fatty liver detection is essential in each clinic and that's why we intended to make one. Proposed expert system, works based on variety of image processing techniques and algorithms to detect fatty liver and recognize its level by four markers. Four segmentation techniques of Otsu, Watershed, K-Means and Particle Swarm Optimization (PSO) are employed to determine disorder level. Performance metrics of Accuracy, F-Score and IoU or Jaccard evaluated the robustness of the proposed system. Finally, fatty liver level is calculated based on amount of fat deposits inside segmented image. Experiments are conducted on multiple data sample in high resolution with microscope zoom bigger or equal of 200 which are collected from the internet. All performance metrics and comparisons returned satisfactory results in comparing with traditional methods. Proposed system could achieve average accuracy value of 0.922 for all samples comparing with ground truth data. Additionally, F-Score and IoU performance metrics returned values are 0.872 and 0.907, respectively.

ICCKE-1096, Introducing E4MT and LMBNC: Persian pre-processing utilities

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In this paper, we introduce two utilities, extensively used in our services and products. A Persian pre-processor(E4MT) we use for both training and inference in our machine translation services and a corpora-level language model-based error corrector(LMBNC), which we apply to corpora before training. E4MT(Essential tools for MT) consists of character normalization, spell correction, entity tagging, and tokenization/detokenization modules. It handles the Persian large vocabulary size problem by approximately reducing the vocabulary size by a factor of 2. We show that applying E4MT on the English-Persian translation task, yields an improvement of at least 1.2 BLEU over other toolkits. We apply LMBNC on the training corpora, which uses a domain-specific language model to identify context-dependent misspellings. The results show, using this corrected training corpora improves the English-Persian translation quality by 0.6 BLEU over its baseline. Additionally, the manual evaluation shows 97.9\% precision for E4MT and 98.1\% precision for LMBNC.

ICCKE-1098, Stock market prediction using multi-objective optimization

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Forecasting in financial markets is challenging due to the inherent randomness of financial data sources and the vast number of factors that affect the market trends. Thus, it is essential to find informative elements within the vast number of available factors to enhance the performance of the predictive models in such a vital context. This makes the feature selection process an integral part of the financial prediction. In this paper, we propose a multi-objective evolutionary algorithm to reduce the number of features employed to predict the yearly performance of the US stock market. The primary idea is to select a smaller set of features with the slightest similarity and the best prediction accuracy. In this practice, we have utilized genetic algorithm, XGBoost and correlation in order to obtain a more diverse set of features which increases the performance. Experiential results show that our proposed approach is able to reduce the number of features significantly while maintaining comparable prediction accuracy.

ICCKE-1099, Classification of COVID-19 and Nodule in CT Images using Deep Convolutional Neural Network

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Distinguishing between coronavirus disease 2019 (COVID-19) infection and nodule as an early indicator of lung cancer in Computed Tomography (CT) images has been a challenge that radiologists have faced since COVID-19 was announced as a pandemic. The similarity between these two infections is the main reason that brings dilemmas for them and may lead to a misdiagnosis. As a result, manual classification is not as efficient as automated classification. This paper proposes an automated approach to classify COVID-19 infections from nodules in CT images. Convolutional Neural Networks (CNNs) have significantly improved automated image classification tasks, particularly for medical images. Accordingly, we propose a refined CNN-based architecture through modifications in the network layers to reduce complexity. Furthermore, data augmentation techniques are utilized to overcome the lack of training data. In our method, Multi Layer Perceptron (MLP) is obligated to categorize the feature vectors extracted from denoised input images by convolutional layers into two main classes of COVID-19 infections and nodules. To the best of our knowledge, other state-of-the-art methods can only classify one of the two classes listed above. Compared to the mentioned counterparts, our proposed method has a promising performance with an accuracy of 97.80%.

ICCKE-1100, AVID: A VARIATIONAL INFERENCE DELIBERATION FOR META-LEARNING

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Meta-learning techniques enable quick learning of new tasks by using few samples with utilizing prior knowledge learned from previous tasks. Gradient-based models are widely used because of their simplicity and ability to solve a wide range of problems. However, they only succeed in solving tasks with a very similar structure since they adapt the model with a shared meta-parameter across all tasks. In recent years, some models have been proposed to enhance the gradient-based models to deal with task uncertainty and heterogeneity via sharing knowledge among similar tasks by using task clustering. Nevertheless, the high-dimensional parameter space of gradient-based models hinders them from achieving their full potential in low-data regimes. Bayesian meta-learning algorithms address this issue by learning a data-dependent latent generative representation of model parameters. Our proposed model bypasses the aforementioned limitations by leveraging Bayesian algorithms as well as clustering input tasks. The final analysis demonstrates the effectiveness of the proposed model for few-shot image classification problems.

ICCKE-1103, City Intersection Clustering and Analysis Based on Traffic Time Series

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In the past few years, the number of private vehicles has risen intensely and will continue to grow in the future. Traffic management has become a significant concern as traffic issues directly affect the quality of life. Different methods have been implemented to track city traffic and find ways to reduce congestion, accidents, etc., but there is room for improvement. This study attempts to cluster city intersections based on their traffic time series to find similar places in the city. The result of this study would help traffic managers have specified policies and behaviors for each group of intersections, which tremendously reduces cost and increases the efficiency of results.

ICCKE-1105, Sum Rate Analysis and Power Allocation in Massive MIMO Systems with Power Constraints

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Since spectral efficiency (SE) is one of the important challenges in fifth generation (5G) telecommunication systems, researchers have extensively addressed this problem. In this paper, the authors have addressed the maximization problem of SE in a massive multiple-input multiple-output (MIMO) system. This optimization problem is resolved by allocating suboptimal power to users. Two constraints have been considered, according to which, the total power consumption of users should not exceed the maximum transmission power, and the power consumption of each user should not be less than a minimum power consumption. By using some changes of variables, the constraints of the optimization problem are simplified, and then, they are eliminated. An iterative algorithm is proposed to find the suboptimal power of users. The simulation results are compared with two algorithms based on game theory and equal power allocation schemes, which shows that the proposed method has a better performance than other two methods.

ICCKE-1107, Analysis of Address Lifespans in Bitcoin and Ethereum

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Bitcoin and Ethereum are the two most used decentralized blockchains. These platforms use a notion of addresses to represent identities in the network. These addresses are publicly visible entities that tell where funds are sent and received on a blockchain. Each user can have multiple addresses in a cryptocurrency network. In this paper, we investigate the lifespan of addresses in these networks, in particular, the lifespan distribution and its relationship with the other features such as turnover, turnover in USD, and transaction count. Our results show that addresses' lifespans follow a Double Pareto-Lognormal (DPLN) distribution. We also showed the relationship between lifespan and turnover, turnover in USD, and transaction count follows a power-law distribution.

ICCKE-1108, GAP: Fault tolerance Improvement of Convolutional Neural Networks through GAN-aided Pruning

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Functionality and accuracy degradation imposed by Bit-Flip faults (BF) on the CNNs' weights makes it vital first to evaluate neural networks' behavior in the presence of faults in the design phase and then make use of these models, especially in safety-critical applications like autonomous vehicles. In the following paper, we propose a novel approach to improve the fault tolerance of convolutional neural networks through pruning their parameters with regard to their gradients instead of the more commonly used norm values. In particular, the gradient of the network's parameters on an auxiliary classification task based on Generative Adversarial Network (GAN) is exploited to identify parameters of lower generalization. Due to the inherent efficiency that all pruning techniques introduce into the model, it is practical to use the ensembled of pruned models. In this paper, we evaluate the functionality of the naïve ensemble versus the ensemble of three differently pruned models. This idea comes from the N-version Programming (NVP) concept of dependability literature. To assess the resiliency of our model, we conduct comprehensive random bit-flip fault injection experiments. Comparing the result of our approach to ordinary pruning techniques, we show that the classification accuracy is improved by 20% in the presence of a single fault in the network. Making an NVP ensemble of three VGG-16 GAN-aided pruned networks, we make a 10% further accuracy improvement in the presence of a single random fault in each base-learner for the CIFAR-10 dataset.

ICCKE-1109, An optimal workflow scheduling method in cloud-fog computing using three-objective Harris-Hawks algorithm

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Today, the Internet of Things (IoT) use to collect data by sensors, and store and process them. As the IoT has limited processing and computing power, we are turning to the integration of the cloud and the IoT. The cloud computing processes the large data at high speed, but sending this large data requires a lot of bandwidth. Therefore, we use fog computing, which is close to IoT devices. In this case, the delay is reduced. Both cloud and fog computing are used to increasing performance of IoT. Job scheduling of IoT workflow requests based on cloud-fog computing plays a key role in responding to these requests. Job scheduling in order to reduce makespan time, is very important in realtime system. Also, reducing the energy consumption improves the performance of the system. In this article, three-objective Harris Hawks Optimizer (HHO) scheduling algorithm is proposed in order to reduce makespan time, energy consumption and increase reliability. Also, dynamic voltage frequency scaling (DVFS) has been used to reduce the energy consumption, which reduces the frequency of the processor. Then HHO is compared with other algorithms such as Whale Optimization Algorithm (WOA), Firefly Algorithm (FA) and Particle Swarm Optimization (PSO) and the proposed algorithm shows better performance on experimental data. The proposed method has achieved an average reliability of 83%, energy consumption of 14.95 KJ, and makespan of 272.5 seconds.

ICCKE-1110, Flying Base Station 3D Positioning, Considering Path Loss, Coverage Area, and QoS Constraints

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Today, the Internet plays a crucial role in our lives, and reliable access to it is vital. The Fifth-Generation (5G) and beyond networks have traditionally improved service delivery, whereas there are still problems in creating the infrastructure of these traditional networks. On the other hand, the advancement of drone technology has brought many applications. One of these applications is providing a 5G service as a Flying Base Station (FBS). In this paper, we have optimized the three-dimensional position of FBSs to provide service to all users under the coverage area, path loss, and QoS constraints. To minimize the number of FBS and the total transmission power, we formulated this problem in the form of the Weighted Set Cover Problem (WSCP), in which the weight of each subset is determined according to the transmission power required by FBS in that subset. To generate the required subsets of the WSCP problem and discrete the problem space, we have presented a mathematical model to provide Selected Position Point (SPP) called Three-Dimensional Mesh Point Reducer (3DMPR). We compare the problem with the unweighted form (SCP) to investigate the effect of weight. The numerical results show that more FBSs will be used by applying the weight effect, while the total transmission power will decrease. Also, the results show that the data rate constraint has the most significant effect on the number of FBS required to provide network service to all users.

ICCKE-1113, Weakly Supervised Convolutional Neural Network for Automatic Gleason Grading of Prostate Cancer

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Digital histopathology is based on the analysis of digitized biopsy slides. Prostate cancer is the second most common cancer among men. The grading of prostate cancer is based on the Gleason grading system. The process of analyzing histopathology images and manually determining the Gleason grades by expert pathologists is a time-consuming and expensive process. Therefore, development of a system based on machine learning can provide an accurate method for grading prostate cancer. But these systems are not easy to develop because they require significant amounts of pixel level annotated data. Since the pathologists' clinical reports often contain only slide-level labels, this type of data is rarely available. Therefore, the development of methods that can learn using only slide-level labels and do not require manual pixel level annotation would be a significant advance in this field. In this paper, we propose a weakly-supervised convolutional neural network for Gleason grading of prostate cancer tissue microarrays with Hematoxylin and Eosin staining, without using pixel level annotations. To choose a suitable classifier, we explored different pre-trained models as a feature extractor, namely ResNet-50, VGG-19 and MobileNet. We used class-wise data augmentation method to face the imbalance problem in our dataset. The best network architecture was ResNet-50 as backbone. In the test cohort, ResNet-50 as backbone with class-wise data augmentation achieved an accuracy of 80% for the Gleason grades.

ICCKE-1114, A Novel Deformable Registration Method for Cerebral Magnetic Resonance Images

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Image registration plays an important role in many cerebral image processing algorithms such as multi-modal image fusion, brain volumetry and parcellation, atlas-based morphometry, and so forth. The registration algorithms can be divided into the rigid and deformable categories. The former takes advantage of global rigid transformations (e.g. affine or rigid-body) while the later employ local deformable vector fields. In this paper, a novel deformable registration algorithm based on calculus of variations is proposed. Its energy functional consists of a second-order regulator term and an external energy functional based on the sum squared errors measure. The former makes the deformable vector field smooth and differentiable while the later increase the similarity between the wrapped moving image and fixed image by optimizing the vector field. Experimental results demonstrated superior performance of the proposed method for a large imagebase including 150 cerebral MPRAGE magnetic resonance images, in three categories of cognitively normal, mild cognitive inference, and Alzheimer disease.

ICCKE-1116, No-Reference Video Quality Assessment by Deep Feature Maps Relations

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The aim of blind video quality assessment (BVQA) methods is to evaluate the perceptual quality of a distorted video without any prior information regarding its reference one. Numerous deep network-based techniques have so far been introduced. These methods often pool the features obtained for each frame in different ways to generate a video representation and evaluate the quality. In this paper, we introduce a novel technique for obtaining frame-level features to assess quality. In order to accomplish this, we explored the deep feature maps relations as useful information for video quality assessment. The Gram Matrix generated in each layer is analyzed and explored as higher-order quality features using pre-trained networks. The deep feature relations can be considered similar to the covariance matrix, which indicates the correlations between different feature maps. In fact, these correlations reflect the structural information of each frame. After features extraction and pooling, support vector regression (SVR) is adopted in order to provide a quality score. Experimental results show the effectiveness of the proposed features and offer comparable performance to the state-of-the-art methods.

ICCKE-1119, A Novel Deep Learning Framework For Image KeyPoint Description

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keypoint detection and description is an initial step for many important computer vision tasks such as image registration, data fusion, change detection, and so on. Recently, data-driven methods have challenged many classical approaches in many fields of computer vision. To this end, a number of deep-learning-based approaches have been developed which specifically account for keypoint detection and description. Convolutional layers are an inseparable part of many computer vision tasks, but they are not completely invariant to rotation. This restricts the capability of a CNN network to extract suitable descriptors for keypoints. To address this problem, this paper proposes a novel deep learning framework for image keypoint description. The proposed method enriches the existing extracted descriptors by CNN. In this approach, a pre-trained network for keypoint detection and descriptor extraction is used. To introduce a rotational invariant descriptor, the rotated versions of the input image are applied and a new descriptor is presented. The evaluated performances demonstrate that the suggested algorithm is more efficient compared with the original CNN framework in terms of the number of correct correspondences, the ratio of correct correspondences, and matching error.

ICCKE-1122, Maximum diffusion of news in social media with the approach of reducing the search space

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Identification of nodes that spread influence is one of the important aspects of social network analysis. These nodes are used for maximizing influence in social networks. Influence maximization is basically an NP-Hard problem. This issue, with large-scale data, faces many challenges such as accuracy and efficiency. This paper offers a new approach in this area, named RSP (Reducing search space in influence maximization Problem). This algorithm selects influential nodes based on centralities and shells of social networks. The nodes in the shortest path are of great importance in the RSP algorithm. Unlike other algorithms, this algorithm does not ignore low-degree nodes. Experimental results show that the proposed algorithm works better than RNR, MCGN, LMP, and LIR on influence spread and maintains the quality of the results in every way.

ICCKE-1123, Damage Detection After the Earthquake Using Sentinel-1 and 2 Images and Machine Learning Algorithms (Case Study: Sarpol-e Zahab Earthquake)

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In remote sensing, by observing an area at different times, changes in the state of an object or phenomenon can be detected. Accurately identifying earthquake-affected areas can significantly aid in providing relief as soon as possible. This study proposes a simple hybrid method based on Sentinel-1 radar and Sentinel-2 optical images to detect damaged areas in Sarpol-e Zahab after the earthquake. This method employs a post-classification approach based on the decision fusion of optical and radar images to generate the change map in urban areas. Furthermore, this study employs Sentinel-1 radar images with the image ratio technique to detect the debris area accurately. The proposed method's change detection maps are visually compared to the European Space Agency's (ESA) produced damage map to validate the results. The final results reveal a good match between the detected damaged areas by the proposed method and the ESA product.

ICCKE-1126, Android Malware Detection using Supervised Deep Graph Representation Learning

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Despite the continuous evolution and significant improvement of cybersecurity mechanisms, malware threats remain one of the most important concerns in cyberspace. Meanwhile, Android malware plays a big role in these ever-growing threats. In recent years, deep learning has become the dominant machine learning technique for malware detection and continues to make outstanding achievements. Deep graph representation learning is the task of embedding graph-structured data into a low-dimensional space using deep learning models. Recently, autoencoders have proven to be an effective way for deep representation learning. However, it is not straightforward to apply the idea of autoencoder to graph-structured data because of their irregular structure. In this paper, we present DroidMalGNN, a novel deep learning technique that combines autoencoders with graph neural networks (GNNs) to detect Android malware in an end-to-end manner. DroidMalGNN represents each Android application with an attributed function call graph (AFCG) that allows it to model complex relationships between data. For more efficiency, DroidMalGNN performs graph representation learning in a supervised manner where two autoencoders are trained with benign and malicious AFCGs separately. In this way, it generates two informative embedding vectors for each AFCG in a low-dimensional space and feeds them into a dense neural network to classify the AFCG as benign or malicious. Our experimental results show that DroidMalGNN can achieve good detection performance in terms of different evaluation measures.

ICCKE-1127, SAT Based Analogy Evaluation Framework For Persian Word Embeddings

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In recent years there has been a special interest in word embeddings as an approach to convert words to vectors. It has been a focal point to understand how much of the semantics of the words has been transferred into embedding vectors. Intrinsic evaluation of word embeddings is cheaper than evaluating them extrinsically and it is usually costly to evaluate the downstream application end-to-end in order to determine the quality of the used embedding model. Generally the word embeddings are evaluated through a number of tests, including analogy test. In this paper we propose a test framework for Persian embedding models. Persian is a low resource language and there is no rich semantic benchmark to evaluate word embedding models for this language. In this paper we introduce an evaluation framework including a hand crafted Persian SAT based analogy dataset, a colliquial test set (specific to Persian) and a benchmark to study the impact of various parameters on the semantic evaluation task.

ICCKE-1128, Experimental evaluation and comparison of anti-pattern detection tools by the gold standard

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Each symptom in a software system's source code or design that violates object-oriented principles such as maintainability, reusability, and integrity is called anti-pattern. Poor design or programming in the software development process can lead to anti-patterns that may cause further problems in software maintenance, so they should be removed by refactoring. The first and most crucial step in software refactoring is anti-pattern detection. Different approaches and tools have been proposed to do this, which provide different results in the same program due to the informal definition of anti-patterns. In this paper, four anti-pattern detection tools have been compared, namely Checkstyle, PMD, iPlasma, and Jspirit. These tools are implemented on the open-source software systems that have been presented as a gold standard in previous studies in this field. The detection results of three anti-patterns are compared: Large Class, Long Method, and Feature Envy. By comparing tools output and the gold standard, we are sure our calculated precision and recall values are correct.

ICCKE-1132, InfOnto: An ontology for fashion influencer marketing based on Instagram

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The present applied research attempts to design an ontology of fashion influencer marketing domain based on fashion marketing resources in Iran that were available during the years 2014-2021. To extract concepts, relationships, and properties with inspiration from the knowledge engineering method proposed by Na and Neoh's study, Delphi and Domain Analysis approach was used in 3815 influencers' selection reason documents. To construct the ontology, a combination of The NeOn Methodology and Ontology Development 101, and Protégé (5.5.0 edition), were used. Ultimately, InfOnto was created with 1 conceptual core, 3 main concepts, 81 concepts, 8 categories, 2373 axioms, 1196 logical axioms, 61 object properties, 72 data properties, and 9 annotative properties. Concepts were evaluated using the Delphi method through interviews and questionnaires with 12 experts. In addition to the full supervision of the experts in all stages of the design and construction of the ontology, 30% of the defined concepts and relations were randomly provided to the experts for testing and approval based on their opinion.

ICCKE-1137, Financial Market Prediction Using Deep Neural Networks with Hardware Acceleration

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Financial market prediction has long been a hard-to-solve problem. Recently many machine learning and deep learning approaches have been taken into account to predict various properties of financial markets, namely volatility, price, and trend prediction. This paper proposes a novel multi-time-frame 1-D convolutional neural network to predict market movements. The model is trained with actual foreign exchange data in an offline setting. The trained model is then deployed on a Xilinx Zedboard Zynq-7000 SoC field programmable gate array (FPGA) to accelerate the calculation and also reducing the power consumption compared to the known approaches. We evaluate the performance of our model on test-set data new to the model; the results show that the proposed model outperforms commonly used models such as long short term memory (LSTM), multi-layer perceptron (MLP), and single-time-scale convolutional neural networks (CNN) with an accuracy of 76.60%. Although deploying the model on FPGA causes a slight accuracy reduction of 2.56%, the evaluations show that the accuracy of the hardware model is still higher than other models. Moreover, according to the evaluation results, performing the inference phase on hardware dramatically reduces latency which is a vital feature for this kind of applications with a factor of roughly 380. Power consumption is also compared and reduced when compared to an Intel server with Xeon ES-2658 processor.

ICCKE-1138, Taguchi Design of Experiments Application in Robust sEMG Based Force Estimation

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This paper investigates the impact of the parameters that affect the accuracy of the force estimation from sEMG signals, including signal acquisition factors, pre-processing and training ones. It offers a procedure for developing a reliable estimation approach to deal with uncertainties, such as the signal deviation while performing various daily tasks using the hand. For doing this, the Taguchi design of experiments (DOE) approach is used to determine appropriate levels of the factors to decrease the regression error. Factors such as the number of electrodes placed on the forearm and the arm, extracted features, the cropping window length and the training regularization term have been categorized as either controllable or uncontrollable in the DOE table. The experiments are conducted on four subjects who perform six different tasks. The L225 mixed-level orthogonal array is used to specify the levels of factors in each experiment. The orthogonal array drastically reduces the required number of executions compared to a full-factorial analysis. Using the Minitab software, the signal-to-noise ratios (SNR) are calculated to determine the optimum levels and significance of the factors. Results indicate that the number of forearm electrodes and their placements are the most influential factors. Moreover, the SNR delta for including the arm biceps muscle is about 0.66, which considering its placement difficulties, it does not justify its additional expense.

ICCKE-1139, Averting Mode Collapse for Generative Zero-Shot Learning

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Zero-shot learning is a promising method for supervised learning methods when there is no labeled data from some classes. In fact, in zero-shot learning, the model classifies the data with no labeled sample present in the training phase. Recently, researchers have shown that the use of conditional adversarial generative networks can be a solution to generate synthetic data from classes that do not have labeled data. In this paper, we try to improve the quality and variety of data generated from classes with no labeled sample through an adversarial generative network by introducing a new architecture. In addition to the changes made in the training phase of the adversarial generator network, a regulator has also been utilized to ensure the diversity of generated data. This regulator also prevents mode collapse. The proposed architecture is assessed on the Animals With Attributes (AWA) dataset. Classification accuracy in ZSL and GZSL settings improved by 1.7% and 2.3% in comparison to the state-of-the-art results.

ICCKE-1142, PeQa: a Massive Persian Quenstion-Answering and Chatbot Dataset

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TA question-answering (QA) system is an application able to communicate with humans using natural language processing. Modelling a dialogue between humans and machines is considered one of the most important tasks of Artificial Intelligence (AI). Creating a Chatbot with a good performance in modelling human-machine conversations is still one of the unsolved challenges in this field. Although Chatbots have many applications, in general, they should understand users' meaning through their words and provide them with relevant answers.
In the past, Chatbot architectures mainly relied on rules or statistical methods. With the advent of deep learning methods, trainable neural networks soon replaced the traditional models. These sorts of deep models are highly affected by the dataset that would be fed into them, and there is no big enough one available in the Persian language! We present a huge dataset of 14 million Persian tweets from tweeter that is meticulously processed to create a rich collection of 420,000 pairs of question-answer data. We also present modelling results on Transformers, including Sensibleness and Specificity Average (SSA) and the BLEU metric. We will release our dataset, modelling code, and models publicly.

ICCKE-1145, Automated Person Identification from Hand Images\\using Hierarchical Vision Transformer Network

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Nowadays, person identification is widely used for security purposes. Identity verification is done using a variety of techniques. Biometric authentication is the most well-known and popular secure kind of authentication in most devices. In this research, dorsal and palmar hand images, which are regarded as two important biometric characteristics, are both used for biometric authentication. In order to take into account both global and local variables for determining human identity, We propose a two-stream hierarchical vision transformer with two independent inputs of the whole hand image and knuckle sub-images drawn from the 11k-Hand dataset. As a result of this approach, we achieved an accuracy of 99.4\% and an error rate of 2.47% to identify people.

ICCKE-1148, A Survey on Semi-Automated and Automated Approaches for Video Annotation

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Video analytics systems have recently gained intensive attention due to the fact that they play a practical role in a broad range of topics, including understanding scenes in autonomous driving and processing huge volumes of video data. Nevertheless, labeling frame-by-frame of video datasets is extremely cost-prohibiting and time-consuming. Therefore, the development of effective annotation systems will be crucial for the generation of proper annotations for large-scale datasets of video. This survey paper briefly reviews novel representative literature and systematizes the commonalities in different machine learning techniques such as supervised learning, active learning, transfer learning, and neural networks. We consider some reviews that introduce annotation tools as well. Ultimately, we summarized the performances of all the mentioned approaches applied to various datasets and demonstrated the experimental results.

ICCKE-1149, Solving the influence maximization problem by using entropy and weight of edges

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The influence maximization problem (IMP) was raised to find the number of K nodes as a subset of all social network nodes. Many other social network nodes can be activated to get information by obtaining the right nodes in this set. Solving this problem optimally will improve and increase marketing and widely transfer any information on social networks. Although many studies have investigated this issue, there are a few studies on this algorithm for providing an optimal solution. Moreover, less attention has been paid to the difference between edges and their weights in society. Therefore, this study set a score appropriate to the conditions of each node according to the topological criteria and entropy, the level of communication, and the degree of neighbors of each node. Then, a set of influential nodes was carefully identified according to the scores and their measurement.

ICCKE-1150, Span-prediction of Unknown Values for Long-sequence Dialogue State Tracking

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Dialogue state tracking is one of the main components in task-oriented dialogue systems whose duty is tracking the user goal during the conversation. Due to the diversity in natural languages and existing different utterances, the user requests may include unknown values at different turns in these systems. However, predicting true values of the user requests is necessary for completing the intended task. In existing studies, these values are determined using span-based methods to predict a span in utterances or previous dialogues. However, the slots are not correctly filled when values are multi-word. In addition, in some scenarios, the slot values in a given turn may depend on previously dialogue states. However, due to the limitation of the input length of language models, it is impossible to access all the previous dialogue states. In this study, a new approach is proposed that uses a span-tokenizer and adds the Bi-LSTM layer on top of the BERT model to predict the exact span of multi-word values. This approach uses parameters like user utterance, important dialogue histories, and all dialogue states as input to decrease the length of the sequences. The results show that this strategy has led to 1.80% improvement in the joint-goal accuracy and 0.15% improvement in the slot accuracy metrics over the MultiWOZ 2.1 dataset compared to the SAVN model.

ICCKE-1153, An Automated Visual Defect Segmentation for Flat Steel Surface Using Deep Neural Networks

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Defect detection on the metal sheets is an importance for the steel production industry. This paper proposes an automated visual defect segmentation for flat steel surface using two different deep neural network methods, namely U-Net and ResNet34, MobilNetV2, EfficientNetB0, InceptionV3, and VGG16 have been implemented as the U-Net's encoder. In addition, FCN-8 model has been investigated as a different architecture for the SEVERESTAL dataset. Due to the imbalanced dataset, various techniques such as dice coefficient as loss function and data augmentation have been used. Moreover, no-defect steel surfaces have been considered as a separate class. As a result, a promising dice score is achieved on the validation set for the described four-class approach.

ICCKE-1160, A Review on Secure Data Storage and Data Sharing Technics in Blockchain-based IoT Healthcare Systems

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Transmitting and maintaining integrity in storage and sharing healthcare data are essential issues. In recent years, a considerable amount of literature has been published on storage and sharing healthcare data. Therefore, there has been being a growing body of literature in this field. The advent of blockchain has provided a secure platform for storing and sharing data, therefore, blockchain has been used in healthcare systems. Although some blockchain-based IoT healthcare systems have been implemented on the smart contract platform, due to the special properties of these systems, general smart contracts have been not met their requirements. So, in recent years, some IoT healthcare systems are going to design and develop their blockchain networks. Therefore, in this article, we will have an extensive review on secure data storage and data sharing technics in blockchain-based IoT healthcare systems. We categorized them into two categories: 1) blockchain-based IoT healthcare systems on smart contract platforms and 2) designing blockchain-based IoT healthcare systems. Attributes and challenges of these systems are investigated that are consisted of security criteria, consensus algorithms, and implementation tools. Therefore, in recent years, the blockchain-based IoT healthcare systems have tended to focus on designing their blockchain networks rather than using smart contract. To achieve this aim, a trade-off is required between security criteria, consensus algorithm, and implementation platform.

ICCKE-1161, Robat-e-Beheshti: A Persian Wake Word Detection Dataset for Robotic Purposes

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In this paper we explain a dataset that we collected for a wake word detection project which works on classifying audio data. The data is audio files in persian language. We collected 5738 audio files with different formats and a maximum length of 3 seconds. Then we changed the formats and their sample rates to the specific one. We have positive and negative examples for our dataset. Different audio recorders were used for recording the audios and most of the data gathered from 187 individuals and the other files collected from open source ShEMO dataset: a large-scale validated database for Persian speech emotion detection.

In this paper we explain the process of collecting data, how they are organized in different files and also we explain the data analysis. This dataset will be free for academic usage with official request to us.

ICCKE-1163, Facial Mask Wearing Condition Detection Using SSD MobileNetV2

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Wearing a facemask is one of the main ways to prevent the spread of respiratory diseases such as Covid-19, so it is helpful to monitor people's facemask-wearing status through vision-based systems. In this paper, a system has been developed that divides the people's face mask-wearing conditions using image processing into three classes: without a mask, correct mask-wearing, and incorrect mask-wearing. For this purpose, the SSD-MobileNetV2 neural network has been used, and several hyperparameter sets have been compared for the best possible accuracy. Also, a lightweight custom CNN has been used as the second stage to improve the classification accuracy, so this stage can be used in cases where higher accuracy is required. Finally, the proposed neural network was implemented on a Raspberry-Pi3, and this system can control an entrance gate using a servo motor automatically.

ICCKE-1167, LPCNet: Lane detection by lane points correction network in challenging environments based on deep learning

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Recently, lane detection methods with the help of deep learning have achieved significant accuracy in various conditions. But many do not perform well in computational complexity and are not applicable for real applications. In addition, their accuracy decreases in challenging situations. In this article, after identifying the critical points by the hourglass algorithm, we remove the redundant and invalid points using the Random Sample Consensus (RANSAC) algorithm. The line point correction network (LPCNet) achieves acceptable accuracy in challenging conditions such as desert roads with poor texture and foggy conditions with poor light and clarity. Also, the computational complexity of the system is suitable, making it practical for real-time execution. The number of network parameters is 4.5 million and significantly reduced compared to the valid methods. The execution speed in the tensor version reaches 32 frames per second, and the accuracy of the network in unlined environments is estimated at 49.80%.

ICCKE-1177, A 2D-CNN Architecture for Improving the Classification Accuracy of an Electronic Nose with Different Sensor Positions

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The responses of Metal oxide gas sensors (MOXs) are affected by various factors; one of them is their location. For achieving a good classification accuracy by an Electronic Nose (E-Nose), extracting informative features with consideration of the spatial information of signals is necessary. A popular E-Nose dataset consisting of the responses of 72 MOX sensors from eight types and in nine positions to 10 pollutants in 1165 experiments was used to investigate the importance of considering the location of sensors. A method is proposed based on a simple Two-dimensional Convolutional Neural Network (2D-CNN) and compared to a 1D-CNN with the same number of parameters. It is shown that the 2D-CNN scheme results in 97.8% detection accuracy, which is 7.5% upper than the accuracy value of 1D-CNN. It is concluded that by considering the spatial and temporal information of signals by 2D-CNN, better feature extraction and a more accurate classifier could be reached.

ICCKE-1178, Designing a High Perfomance and High Profit P2P Energy Trading System Using a Consortium Blockchain Network

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Renewable energy generating systems can be used to supply some or all of electricity needs, using technologies like solar, wind or micro hydropower systems. Trading of this kind of decentralized energy is important to owners of these local systems. Regional p2p energy trading systems provide a solution for this issue. Due to expanding the concept of decentralization and blockchain-based trading models, some studies in recent years propose such models for local surplus energy trading. In this paper, we propose a distributed energy-trading framework based on a consortium blockchain for p2p energy trading energy of renewable energy systems. Our proposed model uses Jointgraph, a novel Byzantine fault-tolerance consensus algorithm and a DAG-based consortium energy blockchain framework, which highly improves the performance of the trading model. Furthermore, we use Belief Distorted Nash Equilibrium (BDNE) for pricing strategy to increase the profitability of the system for both buyers and sellers. The implemented simulation, confirm that the proposed framework outperforms similar p2p trading models in terms of both performance and profitability and can be used in real local energy trading systems.

ICCKE-1182, Weakly Supervised Learning in a Group of Learners with Communication

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In the initial research, we executed these inferences according to the limited graph that we used as input, although the approximate inference can also be used. We have designed a system where learners with little knowledge of the problem can label unlabeled data with each other's help and this data can be used to train learners. It should be noted that sharing opinions It causes solidarity. In our proposed method, the accuracy of the system is controlled by preventing the correlation effect between users in voting for labeling unlabeled data.

ICCKE-1183, FAHP-OF: A New Method for Load Balancing in RPL-based Internet of Things (IoT)

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One major issue in RPL-based networks is that the nodes themselves have to do routing and packet transmission. At the same time, they may be extremely tight on resources like Energy, Computation, and storage. This issue makes optimized route establishment of paramount importance in RPL-based networks. However, this task is not easy since multiple network links and node metrics must be considered, and different criteria must be satisfied when making decisions. In this paper, we devise and propose FAHP-OF, which takes advantage of Fuzzy Logic as a soft criteria decision-making system and the Analytic Hierarchy Process (AHP) as a Multi-Criteria Decision Making (MCDM) technique. This method feeds three quantitative metrics named Hop-Count, ETX, and RSSI of an assortment of eligible parents for a node to the Fuzzy system to decide if a node can abandon its current parent and adopt a new one. Afterward, the Analytic Hierarchy Process (AHP) assigns scores to the eligible parents, and the parent with the highest score is adopted. Results obtained by the Cooja simulator indicate improvements in terms of End-to-End Delay (E2ED) and Packet Delivery Ratio (PDR) in comparison to other objective functions.

ICCKE-1185, Spatial-channel attention-based stochastic neighboring embedding pooling and long short term memory for lung nodules classification

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Handling lesion size and location variance in lung nodules are one of the main shortcomings of traditional convolutional neural networks (CNNs). The pooling layer within CNNs reduces the resolution of the feature maps causing small local details loss that needs processing by the following layers. In this article, we proposed a new pooling-based stochastic neighboring embedding method (SNE-pooling) that is able to handle the long-range dependencies property of the lung nodules. Further, an attention-based SNE pooling model is proposed that could perform spatially and channel attention. The experimental results conducted on LIDC and LUNGx datasets show that the attention-based SNE pooling model significantly improves the performance for the state of the art.

ICCKE-1188, Semantic Segmentation Using Region Proposals and Weakly-Supervised Learning

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Region proposal plays an important role in computer vision and successfully improves performance. This paper presents an efficient method using the region proposal for semantic segmentation. The main aim is to generate annotated data for deep learning techniques effortlessly. For this purpose, a region proposal algorithm is used to convert an image into several regions. According to defined rules, regions are explored, and some precise regions are selected. A new algorithm is introduced to generate useful masks only by supervising annotated data in the form of the bounding box. After that, these masks are fed to a deep semantic segmentation network. The proposed method shows good results for weakly supervised learning semantic segmentation on the VOC2012 dataset. Also, this method can be employed to generate huge annotated data automatically and used to train deep networks.

ICCKE-1189, FAST: FPGA Acceleration of Neural Networks Training

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Training state-of-the-art ANNs is computationally and memory intensive. Thus, implementing the training on embedded devices with limited resources is challenging. In order to address this challenge, we propose FAST, a low-precision method to implement and optimize ANN training on FPGA. FAST first addresses the challenge of implementing the non-polynomial sigmoid activation function by presenting a solution using PNLA methods. Then, it introduces Hardware Optimized PReLU (HOPE) activation function, which is specifically devised to reduce the required resources and increase the accuracy of computations on FPGA. We evaluated FAST against the software implementations of ANNs, using training tasks available in the MNIST benchmark. The results show that FAST improves the training speed by 8.6× and reduces the required memory size by orders of magnitude. It is worthwhile to mention that the method imposes almost no degradation in training accuracy.

ICCKE-1190, An interactive user groups recommender system based on reinforcement learning

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Nowadays, there are countless and diverse user data in various fields, which requires analysis to find a set of target users. To understand and identify users, exploration can be done interactively in several steps. Considering that the goal is to find users and the datasets are not related to each other, so this type of learning causes an exploration error. This issue is far more effective for a recommendation that includes discrete exploration actions. This paper uses semantic similarity techniques between datasets to improve the problem of exploration of user groups. This model was created by using reinforcement learning, which uses a simulated agent to learn a suitable policy for exploration recommendations. In this framework, discovery is an iterative decision-making process that includes various types of discovery actions. An agent represents a set of groups from which target users are selected and then recommends the best action for the next step. The results and experiments show that the agent can learn the policy without gathering previous sessions and finally provide an acceptable recommendation.

ICCKE-1191, Load Frequency Control of Geothermal Power Plant Incorporated Two-Area Hydro-Thermal System with AC-DC Lines

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B. Srikanth Goud – Anurag University
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In this paper, load frequency control (LFC) of a two-area hydro-thermal (TAHT) system with the integration of a geothermal power plant (GTPP) in area-1 is considered for investigation. Proportional-integral-double derivative (PIDD) controller rendered optimally using water cycle algorithm (WCA) subjected to integral square error (ISE) index is presented as a secondary regulator. LFC analysis is carried out by subjugating area-1 of the investigative system with a step load perturbation of 10% (10%SLP). Efficacy of PIDD is demonstrated with the PI, and PID performances. Moreover, the supremacy of WCA-tuned PIDD is validated with recent control techniques reported in the literature. Further, the GTPP integrated THAT system is enacted with an HVDC line as an additional tie-line in parallel with an existing line to achieve performance enhancement.

ICCKE-1192, A parallel CNN-BiGRU network for short-term load forecasting in demand-side management

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Nowadays power companies are trying to monitor energy consumption to provide demand response. Energy management and scheduling are possible through short-term load forecasting. Energy supply stability and efficiency depend on accurate forecasting, which balances demand and supply. In this paper, a novel day-ahead residential load forecasting method is introduced. A new parallel deep learning network is presented that is based on CNN and GRU networks. Some features are extracted from the dataset during pre-processing. The CNN models extract more information from these features in two parallel paths. By observing the input both forward and in reverse directions, bi-GRU networks are used to learn long dependency patterns. The proposed method is evaluated using real-world data collected by the Mashhad energy distribution company. In comparison with state-of-the-art methods, the proposed method has the lowest RMSE, MAE, and MAPE values of 49.04, 34.37, and 3.81, respectively.

ICCKE-1194, Hate Sentiment Recognition System For Persian Language

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People’s lives in societies, today are tied to social networks and these networks face problems such as the existence of hateful speech. Most social networks try to identify and prevent the spread of this phenomenon by using natural language processing (NLP) methods. On the internet, hate speech causes arguments between different groups in society. Given that anyone is able to put any content on social media in the form of a short text, this leads to the uncontrollable spread of hatred on social networks and can cause harm to individuals and various groups in society. This is necessary to have control over users’ content on social media. In this study a method for identifying hateful content in short texts is proposed.

First, TF-IDF of word-based and character-based n-grams are calculated. Then, employing calibrated support vector machine (SVM), the probability of each n-grams related to hatred is calculated. Finally, another SVM is applied for final classification. The proposed method is compared to the state-of-the-art methods using In-stagram comments on various performance metrics. Results show that the proposed method outperforms the previous studies.

ICCKE-1195, Intelligent Interpretation of Frequency Response Signatures to Diagnose Radial Deformation in Transformer Windings Using Artificial Neural Network

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Transformers are vital elements of a power system network in which continuous service is of great importance, and high reliability of the entire network depends on health condition of the transformers. Transformer windings are susceptible to mechanical tensions as a result of poor operation or transit. Radial deformation (RD) as a mechanical winding defect exerts disruptive influences on the performance of the transformer. In the field of transformer monitoring, frequency response analysis (FRA) has established itself as a reliable diagnostic tool. Nonetheless, complexity and open questions surround the decipherment of FRA results because reliable interpretation code is unavailable. This study presents an artificial intelligence-based code for interpreting frequency response traces. In this study, RD faults are practically applied to the windings of a 1600 kVA distribution transformer operating at 20 kV. Practical measurements are taken of FRA traces, and then feature vectors are extracted using adequate and sensitive numerical indexes, including cross-correlation factor (CCF), normalized root mean square deviation (NRMSD), Lin's concordance coefficient (LCC), and fitting percentage (FP). All four parts of frequency responses which are magnitude, angle, real, and imaginary parts are investigated. In addition, an artificial neural network (ANN) regarded as an intelligent classifier employing extracted features to distinguish locations of RD defects. In order to assess the performance of the proposed intelligent network, K-fold cross validation technique is utilized. The most appropriate numerical index beside the most effective part of the frequency response are introduced.

برترین مقاله

برجسته‌ترین گواهینامه شایستگی مقاله براساس کیفیت، اصالت و اهمیت توسط کمیته علمی پیشنهاد می‌شود که به مقاله زیر اعطا گردد:

ICCKE-1192, A parallel CNN-BiGRU network for short-term load forecasting in demand-side management

Arghavan Irankhah - Sahar Rezazadeh Saatlou - Mohammad Hossein Yaghmaee - Sara Ershadi Nasab - Mohammad Alishahi

برترین داور

همچنین برترین داور برگزیده در این دوره به ترتیب به جواد حمیدزاده، سمیه مسلم نژاد و مونا مرادی اعطا می‌شوند.

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3	Mona Moradi	University of Semnan

کارگاه‌های آموزشی

در حاشیه کنفرانس کارگاه‌های مختلفی در زمینه‌های مختلف توسط اعضای و حامیان کنفرانس به شرح زیر برگزار شد:

- **هوش مصنوعی قابل توضیح: ۴ ساعت**
  - حوا علیزاده، دکتری. دانشجوی مهندسی کامپیوتر، دانشگاه فردوسی مشهد، عضو آزمایشگاه WTLAB.
  - سحر قصابی، دانشجوی کارشناسی ارشد مهندسی کامپیوتر، دانشگاه فردوسی مشهد، عضو آزمایشگاه WTLAB.
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هوش مصنوعی قابل توضیح هوش مصنوعی است که در آن انسان ها می توانند تصمیمات یا پیش بینی های انجام شده توسط هوش مصنوعی را درک کنند. به عبارت دیگر، XAI ایجاد مجموعه‌ای از تکنیک‌های ML را پیشنهاد می‌کند که ۱) مدل‌های قابل توضیح‌تری تولید می‌کند و در عین حال سطح بالایی از عملکرد یادگیری را حفظ می‌کند (به عنوان مثال، دقت پیش‌بینی)، و ۲) انسان‌ها را قادر می‌سازد تا درک کنند و به طور مناسب اعتماد کنند. این کارگاه با هدف پوشش برخی از مهمترین موضوعات در هوش مصنوعی قابل توضیح (به عنوان مثال منبع اطلاعاتی برای توضیحات، رویکردهای مدل درونی یا مدل-آگنوستیک، ارزیابی مدل های قابل توضیح، LIME، SHAP و موارد دیگر) و کاربردهای آنها در زمینه های موضوعی مهم مانند توصیه کننده است. سیستم های. علاوه بر این، یک کتابخانه متن باز به نام Captum معرفی خواهد شد. Captum به محققان ML کمک می کند تا الگوریتم های تفسیرپذیری را که می توانند با مدل های PyTorch تعامل داشته باشند، آسان تر پیاده سازی کنند.

- **سیستم‌های گفتگو محور:۴ ساعت**

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سیستم گفتگو یک برنامه کامپیوتری است که یک رابط بین کاربر و یک برنامه مبتنی بر رایانه فراهم می کند که امکان تعامل با برنامه را به شیوه ای نسبتاً طبیعی فراهم می کند. هدف سیستم گفتگو تسهیل تعامل کاربر با خدمات، محصولات یا شرکت های آنلاین است. یک شخص می تواند با این سرویس آنلاین به زبان طبیعی تعامل داشته باشد. در مقابل، عامل گفتگو در طرف دیگر این کانال، از درک زبان طبیعی برای درک و صحبت با انسان ها استفاده می کند. به طور کلی، این سیستم ها باید هدف کاربران را درک کنند و پاسخ های مربوط به مشکل کاربر را ارائه دهند. در این کارگاه به معرفی انواع سیستم های محاوره ای (وظیفه محور و دامنه باز) و تشریح اجزای آنها می پردازیم. سپس چالش ها، مجموعه داده های مورد استفاده در اجزای مختلف و نحوه ارزیابی آنها را مورد بحث قرار می دهیم. پارادایم های صنعتی و همچنین پیشرفته ترین معماری ها در این زمینه (معرفی شده توسط گوگل و فیسبوک) مورد بررسی قرار می گیرد. به عنوان مثال، این معماری ها از شبکه های عصبی عمیق و ترانسفورماتورهای دنباله به دنباله استفاده می کنند. در پایان علاوه بر نحوه پیاده سازی چت بات صنعتی، پیاده سازی اجزای مختلف یک سیستم گفتگوی پیچیده (مانند درک زبان طبیعی: تشخیص قصد و پر کردن اسلات) مورد بحث قرار خواهد گرفت.

- **محاسبات انسانی: ۴ ساعت**

- محمد اله بخش، دانشیار گروه مهندسی کامپیوتر، دانشگاه فردوسی مشهد. دانشیار افتخاری در دانشگاه مک کواری، سیدنی، استرالیا.
- ساره صادقیان اصل، پژوهشگر دانشکده سیستم های اطلاعات، دانشگاه فناوری کوئینزلند، بریزبن، استرالیا.

حضور کامپیوتر و هوش مصنوعی در تمام جنبه های زندگی روزمره ما از جنبه های شخصی گرفته تا حرفه ای و تحقیقاتی روز به روز در حال افزایش است. اگرچه رایانه قادر به حل مسائل پیچیده است، اما هنوز برخی از وظایف وجود دارد که رایانه یا اصلاً قادر به انجام آنها نیست یا سطح دقت بسیار پایینی دارد. شناسایی اشیاء در تصاویر، بررسی ارتباط و رونویسی صدا نمونه های کمی از این کارها هستند. از آنجایی که از هوش انسانی برای انجام این وظایف استفاده می شود، آنها را وظایف هوش انسانی یا HIT می نامند. مدل محاسباتی استفاده از هوش انسانی در انجام وظایف را محاسبات انسانی می نامند. جمع سپاری و بازی های جدی نمونه هایی از محاسبات انسانی هستند. در این کارگاه به مفاهیم اولیه محاسبات انسانی می پردازیم. ما همچنین مهمترین جنبه های آن را، به ویژه از نظر تکنیک های تجزیه کار و تجمیع، مطالعه خواهیم کرد. علاوه بر این، کنترل کیفیت را به عنوان مهم‌ترین دغدغه در کاربرد محاسبات انسانی بررسی خواهیم کرد. گیمیفیکیشن به عنوان یکی دیگر از روش‌های مهم استفاده از محاسبات انسانی مورد مطالعه قرار خواهد گرفت.

- **روانشناسی محاسباتی: ۴ ساعت**

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- رضا سعیدی، دکتری. دانشجوی مهندسی کامپیوتر، دانشگاه فردوسی مشهد، عضو آزمایشگاه WTLAB.

روانشناسی محاسباتی یک رشته بین رشته ای است که شکاف بین روانشناسی و هوش مصنوعی را پر می کند. هدف آن ایجاد بازنمایی از فرآیندهای ذهنی در افراد است. طیف گسترده ای از موضوعات و روش ها در کاربرد مفاهیم محاسباتی برای درک رفتار انسان پوشش داده شده است. از جمله می توان به تمایل روزافزون محققان به استفاده از روش های یادگیری ماشینی برای مطالعه و پیش بینی اختلالات روانی بر اساس مجموعه داده های بالینی یا انبوه مانند فعالیت بلادرنگ کاربران رسانه های اجتماعی اشاره کرد.

پیوست