

برنامه سی‌امین کنفرانس بین‌المللی مهندسی برق

| روز | آغاز | پایان | جزئیات برنامه |
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توجه: میزگردها و مراسم افتتاحیه همزمان بصورت حضوری و مجازی برگزار می‌شود
مکان برگزاری حضوری: خیابان حافظ، دانشگاه صنعتی امیرکبیر، ساختمان ابوریحان، طبقه هشتم، اتاق شوای
دانشکده

Speakers Info:



Prof. Eduardo F. Camacho

Professor of Automatic Control, University of Seville, Spain

Bio:

Eduardo F. Camacho (Life Fellow, IEEE) received the Ph.D. degree in electrical engineering from the University of Seville, Spain, in 1977. He is a full professor at the University of Seville. He has authored several books, including Model Predictive Control in the Process Industry (Springer, 1995), Advanced Control of Solar Plants (Springer, 1997), Model Predictive Control (Springer, 1999, 2004 2nd edition), Control of Dead-Time Processes (Springer, 2007), and Control of Solar Systems (Springer, 2011). He was the recipient of an Advanced Grant by the European Research Council in 2018.

Prof. Amin Beheshti

Professor in Data Science and Director of AI-enabled Processes (AIP) Research Centre, Macquarie University, Sydney, Australia

Prof. Amin Beheshti is a Full Professor of Data Science and the Director of AI-enabled Processes (AIP) Research Centre, School of Computing, Macquarie University. Amin is also the head of the Data Analytics Research Lab and Adjunct Academic in Computer Science at UNSW Sydney. Amin completed his Ph.D. and Postdoc in Computer Science and Engineering at UNSW Sydney and holds a Master and Bachelor in Computer Science both with First Class Honours. In addition to his contribution to teaching activities, Amin extensively contributed to research projects; where he was the R&D Team Lead and Key Researcher in the 'Case Walls & Data Curation Foundry' and 'Big Data for Intelligence' projects. Amin has been recognized as a high-quality researcher in Big-Data/Data/Process Analytics and served as Keynote Speaker, General-Chair, PC-Chair, Organisation-Chair, and program committee member of top international conferences. He is the leading author of several authored books in data, social, and process analytics, co-authored with other high-profile researchers. Amin was able to secure over \$9.8 Million in Research Grants for AI-Enabled, Data-Centric, and Intelligence-Led projects.



Speech Title:

"Engineering the Next Wave of Big Data and Artificial Intelligence"

Abstract:

Electrical and computer engineers play a vital role in advancing the ongoing evolution of Artificial Intelligence (AI). Smart entities, the Internet of Things, and Ubiquitous computing are a few examples that benefit from AI and open doors for new possibilities in AI-enabled processes, driving cars, fraud detection, and countless other applications. Big Data also plays an important role here, as it

provides the fuel for AI engines. In this talk, I will introduce you to the world of Big Data and Artificial Intelligence and highlight the need to investigate the impact of Artificial Intelligence in the digital ecosystem. I will also discuss a few projects we are developing in the AI-enabled Processes (AIP) Research centre, from Intelligent Knowledge Lakes to smart entities and process automation.

Prof. Pierluigi Siano

Department of Management and Innovation Systems
University of Salerno

Pierluigi Siano (M'09, SM'14) received the M.Sc. degree in electronic engineering and the Ph.D. degree in information and electrical engineering from the University of Salerno, Salerno, Italy, in 2001 and 2006, respectively. He is a Professor and Scientific Director of the Smart Grids and Smart Cities Laboratory with the Department of Management & Innovation Systems, University of Salerno. Since 2021 he has been a Distinguished Visiting Professor in the Department of Electrical & Electronic Engineering Science, University of Johannesburg.



His research activities are centered on demand response, energy management, the integration of distributed energy resources in smart grids, electricity markets, and planning and management of power systems. In 2019, 2020, and 2021 he has been awarded as a Highly Cited Researcher in Engineering by Web of Science Group. He has been the Chair of the IES TC on Smart Grids. He is Editor for the Power & Energy Society Section of IEEE Access, Transactions On Power Systems, IEEE Transactions On Industrial Informatics, IEEE Transactions On Industrial Electronics, IEEE Systems.

Speech Title: Smart energy Communities Optimization

Abstract: A novel scalable and privacy-preserving distributed parallel optimization that allows the participation of large-scale aggregation of prosumers with residential PV-battery systems in the market for the ancillary service (ASM) is discussed in this speech. To consider both reserve capacity and reserve energy, day-ahead and real-time stages in the ASM are considered. A method, based on hybrid Variable Neighborhood Search (VNS) and distributed parallel optimization is designed for the day ahead and real-time optimization. Different distributed optimization methods are compared and designed and a new distributed optimization method based on Linear Programming (LP) is designed that overcomes previous methods based on integer and Quadratic programming (QP). The proposed LP-based optimization can be easily coded up and implemented on microcontrollers, and connected to a designed Internet of Things (IoT) based architecture. Both day-ahead and real-time proposed optimization methods, by allocating the computational effort among local resources, are highly scalable and fulfil the privacy of prosumers.

Prof. Eduard Petlenkov

Department of Computer Systems, Tallinn University of Tech.,
Estonia



Bio:

EDUARD PETLENKOV is currently a Tenured Full Professor in the Department of Computer Systems, Tallinn University of Technology and the head of the Centre for Intelligent Systems. He received the B.Sc. (2001), M.Sc. (2003), and Ph.D. (2007) degrees in computer and systems engineering from the Tallinn University of Technology. His main research interests include the domain of intelligent control, system analysis and computational intelligence.

Speech Title: Intelligent Solutions for Building Automation.

Abstract: The keynote talk will be devoted to a real life example of an Artificial Intelligence based application for building automation. It will be shown how AI, machine learning and data-driven approach help to significantly reduce energy consumption and guarantee good indoor climate in commercial real estate without any need to install additional devices. It is also an example of fruitful collaboration between academia and private sector.

Speaker: Ali Sheikholeslami, Department of Electrical and Computer Engineering, University of Toronto, Canada

Bio: Ali Sheikholeslami received his bachelor's degree from Shiraz University, Iran, in 1990, and his M.A.Sc. and Ph.D. degrees from the University Toronto, Canada, in 1994 and 1999, respectively, all in Electrical and Computer Engineering. Since 1999, he has been a professor at the University of Toronto, Canada, where he is currently the head of Fujitsu Co-creation Research Laboratory. His main research interests are in the areas of analog and digital integrated circuits, with a focus on CMOS Annealing and high-speed signaling. He has coauthored over 100 papers, 10 patents, and a graduate-level textbook entitled Understanding Jitter and Phase Noise.



Prof. Sheikholeslami has received numerous teaching awards, both from the ECE department and the Faculty of Applied Science and Engineering at the University of Toronto. He currently serves as the Vice President, Education, for the Solid-State Circuits Society (SSCS) and the Education Chair for its flagship conference, ISSCC. He was an SSCS Distinguished Lecturer in 2018-2019. He has been an Associate Editor for the IEEE Solid-State Circuits Magazine, in which he has a regular column entitled "Circuit Intuitions".

Title: Electronics Beyond the End of Moore's Law (A Keynote Presentation)

Abstract: As the transistor scaling reaches its limits, there remains a significant gap between what could be accomplished today in the state-of-the-art technologies and what is demanded by the complex problems of our times. The problems of solving city traffic, climate change, brain connectivity, drug discovery, and vaccine discovery in the face of a pandemic, are just a few examples of the complex problems we wish to solve in a reasonable amount of time. A long-term solution to solving these problems lies in the implementation of quantum computers where computation and processing are performed at quantum levels and at cryogenic temperatures. However, the progress of the last few years has revealed that we are still decades (not years) away from deploying quantum computers. Besides, quantum computers, may never be able to replace our efficient, more economical classical computers. Another solution, suitable in short and medium terms, has evolved over the past few years, with a focus on solving an important class of complex problems known as optimization problems. Indeed, many of the difficult problems of our times, such as the ones mentioned earlier in this abstract, are optimization problems. In all these problems, one needs to navigate a non-convex energy landscape in order to find the state corresponding to the global optimum of an energy or cost function. An exhaustive search in such a landscape for the global optimum will take many ages of the universe and hence is impractical. On the other hand, a stochastic search, combined with the power of parallelism, can reduce the time to solution to within a few seconds or minutes.

In this talk, we provide a quick review of the key concepts in stochastic search for global optimum and how the power of parallelism in hardware (CMOS) can be utilized to further reduce the time to solution.

Zainalabedin Navabi School of Electrical and Computer Engineering

College of Engineering University of Tehran Tehran, Iran
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Dr. Zainalabedin Navabi is a professor of Electrical and Computer Engineering at the University of Tehran, and an adjunct professor at Worcester Polytechnic Institute. Dr. Navabi is the author of several textbooks and computer based trainings on VHDL, Verilog and related tools and environments. Dr. Navabi's involvement with hardware description

languages begins in 1976, when he started the development of a register-transfer level

simulator for one of the very first HDLs. In 1981 he completed the development of a synthesis tool that generated MOS layout from an RTL description. Since 1981, Dr. Navabi has been involved in the design, definition and implementation of Hardware Description Languages. He has written numerous papers on the application of HDLs in simulation, synthesis and test of digital systems. He started one of the first full HDL courses at Northeastern University in 1990. Since then he has conducted many short courses and tutorials on this subject

in the United States, Europe and Asia. Since early 1990's he has been involved in developing, producing, and broadcasting online

and video lectures on HDLs, Digital System Test, and various aspects of automated design. In addition to being a professor, he is also a consultant to CAE companies. Dr. Navabi received his M.S. and Ph.D. from the University of Arizona in 1978 and 1981, and his B.S. from the University of Texas at Austin in 1975. He is a senior member of IEEE, a member of IEEE Computer Society, member of ASEE, and ACM.

AI in Design Automation of Digital Systems

Expanded

Title:

The role of AI and ML methods in Design Automation Tools for Faster and Better Realization of Electronic Digital Systems

Abstract:

This talk starts with the role of Artificial Intelligence (AI) in digital design process and how Electronic Design Automation (EDA) has benefited from intelligent decision makings that are made by the EDA tools. After this introduction, we focus on how utilization of intelligence in EDA tools has evolved into ML methods, and how machine learning helps automation of digital design process from the upper platform level to layout. The talk first discusses the digital system abstraction and design flow and tools used at various abstraction levels. We then talk about specific tools and abstraction levels in which machine learning is used. Transformation of hardware from one abstraction level to the next lower level is an example of where ML methods are used at the upper levels, whereas creation of models that contain timing and physical properties is where ML is used at the lower abstraction levels of hardware. Some of the existing and research works will be presented here. Application of ML methods for High-Level Synthesis (HLS) as well as those for testability and reliability of digital electronic systems will be discussed. This talk ends with presentation of two research works at the University of Tehran. In one research, machine learning methods help higher level decision makings based on the information extracted from layout. In another research, transient errors that are observed at the RT level are abstracted to system-level by a neural-network accelerator.



Hashem Oraee was born in Mashad in 1957. He graduated with a First Class Honors degree in Electrical Engineering from University of Wales in Cardiff, UK, in 1980 and received IEE Award for the best graduating student. Dr. Oraee was awarded a PhD degree in electrical machines from University of Cambridge in 1984.

Professor Oraee is currently at Electrical Engineering department, Sharif University of Technology. He is the President of Iran Wind Energy Association and the President of Iran Energy Associations Syndicate.

He is a Fellow of IET, Senior Member of IEEE and Fellow of Iran Electrical & Electronic Engineers Institute.

The Role of Electrical Engineering Industry in the National Economy: Opportunities & Challenges

Keynote Speech to be presented at the 30th Iranian Conference on Electrical Engineering, ICEE 2022, by Prof. Hashem Oraee B.Eng, PhD, C.Eng, SMIEEE, FIET

ABSTRACT

Since the Industrial Revolution, electrical energy has played a pivotal role in the development of global economy. With increasing concern of environmental issues as well as the necessity to combat global warming, growing dependence on fossil energy is neither possible nor sustainable. It is therefore anticipated that until mid-century, considerable development will take place including application of high technology to improve energy efficiency and drastic increase in Renewable Energy.

It is predicted that by 2050, global electrical energy demand will be doubled, 2/3 of which will be provided by wind and solar. Electrification will play an important role in the world economy. Despite the delay, an increasing role for electrical engineering industry is anticipated in the national economy within the next few decades. It is therefore of paramount importance to examine the electrical engineering industry to enable preparation of a national industrial development plan.

The talk will conclude by suggesting that it is time to have a close look at the electrical engineering industry and use the past experience to determine the way ahead for this increasingly important industry.



بیوگرافی

محمدعلی اخایی دانش آموخته دکتری مخابرات سیستم از دانشگاه صنعتی شریف بوده و به عنوان دانشیار دانشکده مهندسی برق و کامپیوتر دانشگاه تهران مشغول به فعالیت می باشد. ایشان در سال ۱۴۰۰ به عنوان معاون راهکارهای دیجیتال و هوشمندسازی مرکز تحقیق و توسعه همراه اول منصوب شدند.

عضویت در کارگروه امنیت اطلاعات معاونت فناوری و امور بین الملل وزارت ارتباطات و فناوری اطلاعات، نماینده پردیس دانشکده های فنی دانشگاه تهران در پژوهشگاه الکترونیک صایران، عضویت در کارگروه تخصصی سایبری پژوهشگاه امنیت فضای تبادل اطلاعات (صافتا)، راه اندازی و سرپرستی آزمایشگاه پژوهشی "رایانش و مخابرات امن" دانشکده مهندسی برق و کامپیوتر تهران از سوابق ایشان می باشد.

لینک صفحه:

<https://mci.ir/web/rd>

عنوان: کاربردهای تحلیل داده در صنعت اپراتوری

چکیده

در دنیای امروز داده ها به عنوان راهبردی ترین دارایی سازمان ها شناخته می شوند. یکی از مهمترین نقاط ضعف سازمان ها، عدم توانمندی در استفاده بهینه از داده های گرانبهایی است که با صرف زمان و هزینه بسیار از طریق سامانه های مختلف تولید و یا جمع آوری می شوند.

سازمان داده محور سازمانی است که با استقرار راهکارهای چابک مبتنی بر تحلیل داده ها می تواند علاوه بر کاهش ریسک و مخاطرات و ایجاد فرصت ها و مزیت های جدید، موج جدیدی از تحول را تجربه کند.

نظر به گسترش روزافزون تکنولوژی های نوین در صنایع مخابراتی، استفاده از هوش مصنوعی در تحلیل داده ها از جمله مهمترین عوامل موثر در تحول دیجیتال صنایع مخابراتی به شمار می آید. توجه به این امر با هدف کاهش هزینه ها و افزایش رضایتمندی مشتریان در تمام سطوح سرویس دهی، یک عامل موثر در کسب مزیت رقابتی اپراتورها محسوب می شود.