IEEE SC Hyper-Intelligence TC Newsletter

- ✧ Conference Organization: CyberSciTech/DASC/PICOM/CBDCom 2023
- ✧ Special Issues: IEEE IoTJ, ACM TOSN, Elsevier JSA, IEEE TCE, Elsevier Applied Energy, etc.
- ✧ HITC Task Forces: HIS-TF (new), PIB-TF, WISe-TF

Technical Activities: CyberSciTech/DASC/PICOM/CBDCom 2023, will be held in Abudhabi, UAE

After two years of cyber meeting in 2020 and 2021, we had the IEEE CyberSciTech/DASC /PICom/CDBCom 2022 physically organized in Calabria, Italy, 2022. This year, the IEEE CyberSciTech/DASC /PICom/CDBCom 2023 will be held in Abudhabi, UAE, during Nov. 14-17. The aim of the CyberSciTech Congress is to address the broad challenges in cyber science and technology and to offer a common platform for our fellow scientists, engineers, industrial practitioners, and researchers to present and exchange their latest ideas, discoveries, and implementations (https://icnetlab.org/cyber-science2023/).

Co-Located Conferences

The 8th IEEE Cyber Science and Technology Congress (CyberSciTech 2023)

https://icnetlab.org/cyber-science2023/cyberscitech/index.html

The 21st IEEE International Conference on Pervasive Intelligence and Computing (PICom 2023)

https://icnetlab.org/cyber-science2023/picom/index.html

The 21st IEEE International Conference on Dependable, Autonomic & Secure Computing (DASC 2023)

https://icnetlab.org/cyber-science2023/dasc/index.html

The 9th IEEE International Conference on Cloud and Big Data Computing (CBDCom 2023)

https://icnetlab.org/cyber-science2023/cbdcom/index.html

We will have a four days conference with four Keynotes, 36 sessions, and 14 workshops/special sessions. Thanks to our hosts from Mohamed bin Zayed University of Artificial Intelligence(MBZUAI) for organizing all this amazing infrastructure.

Journals and Special Issues

It is our great honor that our special issue proposals have been approved in several journals:

➢ *IEEE IoT Journal*
Special Issue on Smart Blockchain for IoT Trust, Security and Privacy
Guest editors: Dr. Xiaokang Zhou, Dr. Zheng Yan, Dr. Yan Zhang, Dr. Stephen Yau

This Special Issue intends to provide an international forum for researchers to post up-to-date results using AI and blockchain technologies to enhance TSP in modern IoT systems, which will have a great significance and profound impact on AI, blockchain, and IoT TSP, including: Bringing together the greatest research efforts in the field of IoT TSP by employing smart blockchain technology; Exploring new challenges and future generations of smart blockchain algorithms for IoT TSP issues; Addressing the real-world TSP challenges in the present form of smart blockchain enabled IoT systems by utilizing AI techniques to automatic monitor/diagnose/evaluate/solve related issues, to produce a reliable IoT environment with the support of smart blockchain technology.

➢ *ACM Transactions on Sensor Networks*
Special Issue on Distributed and Collaborative Learning Empowered Edge Intelligence in Smart City
Guest editors: Dr. Xiaokang Zhou, Dr. Vincenzo Piuri, Dr. Henry Leung

This special issue aims to gather novel research works related to emerging theories, techniques, and algorithms in deep learning and collaborative learning for edge intelligence enabled system design and application development in modern smart cities.

➢ *Journal of Systems Architecture*
Special Issue on Distributed Learning and Blockchain Enabled Infrastructures for Next Generation of Big Data Driven Cyber-Physical Systems
Guest editors: Dr. Xiaokang Zhou, Dr. Giancarlo Fortino, Dr. Carson Leung, Dr. Mohammad Hammoudeh

This Special Issue aims to look for original submissions around all theoretical and application-oriented research of big data driven applications using distributed learning and

blockchain technologies. The decentralized architectures, together with the ability to enable secured, trusted and decentralized autonomous ecosystems, revolutionize increasingly centralized Cyber-Physical System for infrastructures and applications, as well as reshaping of traditional data mining and knowledge discovery patterns.

➢ *IEEE Transactions on Consumer Electronics*

   Special Section on Smart Data Driven Modeling for Emerging Customer Applications in Mobile Edge Computing

   Guest editors: Dr. Xiaokang Zhou, Dr. Flavia C. Delicato, Dr. Kevin Wang, Dr. Vincenzo Piuri

This special section intends to provide an international forum for researchers to post up-to-date results using Smart Data Driven Modeling (SDDM) to aid various smart customer applications in Mobile Edge Computing (MEC) environment. Recent advances of the SDDM that support customer decision-makings in MEC can be found in smart home energy management using IoT and MEC, MEC-based assistive system for visually impaired pedestrian safety, emotion-aware music recommendation based on wearable devices with MEC, etc.

➢ *Applied Energy*

   Special Issue on Emerging AI Technologies in Energy Consumption and Carbon Emission Modelling, Evaluation and Forecasting

   Guest editors: Dr. Ke Yan, Dr. Xiaokang Zhou, Dr. Bin Yang, Dr. Lu Liu, Dr. Jin Wen

The special issue aims to provide a forum for researchers and scientists to exchange quality research solutions and results to tackle the carbon emission issues utilizing the emerging AI related technologies for a low-carbon society. Both data-driven and physical model-based forecasting techniques are interested, targeting on more interpretable and efficient carbon emission modelling.

➢ *Computer Communications*

   Special Issue on Artificial Intelligence Meeting Green Edge-Cloud Computing

   Guest editors: Dr. Xiaokang Zhou, Dr. Xiaolong Xu, Dr. Zheng Yan, Dr. Ke Yan

The goal of this Special Issue is to bring together researchers from different fields to focus on artificial intelligence meeting green edge-cloud computing. Applying artificial intelligent techniques to green edge-cloud computing is yet to be addressed. Such challenges include but are not limited to theory and application issues as well as other associated factors related to framework, modelling, algorithm for Green Edge-Cloud Computing (GECC).

The HITC Members are welcome to provide HI related news that introduce the new findings and latest achievements in their own research fields.

Hyper-Intelligence News

Some HI-related news is posted on the HITC website:

What ChatGPT and generative AI mean for science

In December, computational biologists Casey Greene and Milton Pividori embarked on an unusual experiment: they asked an assistant who was not a scientist to help them improve three of their research papers. Their assiduous aide suggested revisions to sections of documents in seconds; each manuscript took about five minutes to review. In one biology manuscript, their helper even spotted a mistake in a reference to an equation. The trial didn't always run smoothly, but the final manuscripts were easier to read — and the fees were modest, at less than US$0.50 per document

ChatGPT Gets Fresh Competition

Just over two months ago, OpenAI released ChatGPT to the public, instantly thrusting the A.I.-powered chatbot into the center of mainstream discourse, with debates about how it could transform business, education and more. (It also spurred Microsoft to invest $10 billion in OpenAI.) Now Google and the Chinese tech giant Baidu have unveiled their own chatbots, hoping to convince the world their efforts in so-called generative A.I. — tech that can spout off conversational text, make images and more — are just as ready for prime time...

ChatGPT is fun, but not an author

In less than 2 months, the artificial intelligence (AI) program ChatGPT has become a cultural sensation. It is freely accessible through a web portal created by the tool's developer, OpenAI. The program—which automatically creates text based on written prompts—is so popular that it's likely to be "at capacity right now" if you attempt to use it. When you do get through, ChatGPT provides endless entertainment...

Gartner publishes Hype Cycle for Artificial Intelligence 2021

Four trends on the Gartner Hype Cycle for Artificial Intelligence, 2021 are driving near-term artificial intelligence (AI) innovation. These trends include responsible AI; small and wide data approaches; operationalisation of AI platforms; and efficient use of data, model and compute resources.

HyperIntelligence, The Future of Data Analytics is here

HyperIntelligence aims to deliver Zero-Click Intelligence. In simple words, it aims to provide key data insights for specific keywords on all web applications. This is facilitated by HyperIntelligence cards.

HyperIntelligence cards are objects that host data and display predefined KPIs that are linked with keywords sourced from datasets from the MicroStrategy platform. These cards also seamlessly combine information from multiple business assets and applications.

AI debating system able to compete with expert human debaters

IBM has developed an artificial intelligence-based system designed to engage in debates with humans. In their paper published in the journal Nature, the team members describe their system and how well it performed when pitted against human opponents.

Debating is a skill humans have been honing for thousands of years. It is generally considered to be a type of discussion in which one or more people attempt to persuade others that their opinion on a topic is right. IBM has created an AI system designed to debate with humans in a live setting.

AI and Life Sciences: Has protein folding been solved?

Amongst the bad news that took up a lot of headlines last year, there was one story at the end of last year that caused a lot of excitement in the life sciences sector. DeepMind's Artificial Intelligence – AlphaFold 2 – appears to have solved the conundrum of protein folding.

The technology to read (and indeed edit) DNA sequences and thus the amino acids sequences that they encode has developed rapidly over the past few decades. However, predicting exactly how amino acid sequences then fold into the complex three dimensional (3D) structures of proteins has, so far, not been possible. The 3D structure of a protein is critical to its biological activity. To identify a protein's 3D structure, it has been necessary to utilise complex and expensive experimental methods (such as X-ray crystallography). This has resulted in a vast chasm between the number of known DNA and amino-acid sequences encoding proteins and the number of known 3D protein structures they encode. The ability to actually predict a protein structure has been thought to be a problem too complex to solve with current technology. Enter artificial intelligence.

HYPER-INTELLIGENCE: Intelligent Shift In Finance

Hyper-intelligence means setting focus on empowering people to work together with AI. This alliance moves businesses to a state where human intelligence, innovation, and imagination are liberated and enhanced by technology. Ultimately, this raises the value and effectiveness of everything a business seeks to do. Hyper-intelligent organizations are transitioning to an infrastructure that delivers the speed, responsiveness, and reliability modern consumers and employees expect for more choice and creativity in the workplace.

Using AI to prevent harm caused by immunotherapy

Researchers at Case Western Reserve University, using artificial intelligence (AI) to analyze simple tissue scans, state that they have discovered biomarkers that could tell doctors which lung cancer patients might actually get worse from immunotherapy.

Using Artificial Intelligence to prevent harm caused by immunotherapyUntil recently, researchers and oncologists had placed these lung cancer patients into two broad categories: those who would benefit from immunotherapy, and those who likely would not.

IBM quantum computing development roadmap envisions applications running 100 times faster

IBM has been among the most aggressive in trying to build momentum for quantum computing. In 2016, the company launched the Q Network, which allows companies to begin experimenting with quantum computers via the company's cloud service. According to Sutor, the Q Network now has more than 135 organizations, including corporations such as JP Morgan Chase and Exxon, as well as universities and startups.

According to IBM's quantum hardware roadmap, the company expects to achieve 100 qubits (the measure of a quantum computer's processing power) this year, 400 qubits next year, and 1,000 qubits by 2023. While there are still major scientific hurdles to clear to make quantum computing superior to classical computing, Sutor said IBM is in a strong position to overcome them.

Task Force in HITC

To promote hyper-intelligence related research, we are forming a series of task forces focusing on potential and challenging topics. So far, we basically have three task forces in HITC, as listed below:

➢ Hyper-intelligent Immersive video Streaming Task Force (HIS-TF)

Immersive video is a type of video recording that simultaneously records views in each or multiple directions and allows the user to switch viewing angles during playback. It has a wide range of applications in education, teleconferencing, healthcare, and many other areas. With the aid of the Hyper-Intelligence technologies, the Hyper-intelligent Immersive video Streaming Task Force (HIS-TF) is formed to address the technical challenges of the encoding, transmission, decoding and computing power requirements of hyper-intelligent immersive video systems to deliver immersive intelligent video streaming systems.

PIB-TF Chair: Zhi Liu, The University of Electro-Communications, Japan

➤ Personalized Intelligent Bot Task Force (PIB-TF)

Personalized Intelligent Bot (PIB) is a kind of intelligent robot or digital-bot embedded with personal characteristics and can achieve numerous fantastic applications, including better human-robot interaction and collaboration, the succession of individual's lifestyle, and even can be extended to individual life. The Personalized Intelligent Bot Task Force (PIB-TF) is formed to identify the essentials of PIB, investigate the PIB construction, and develop its applications.

PIB-TF Chair: Ao Guo, Nagoya University, Japan

➤ Wireless Intelligent Sensing Task Force (WISe-TF)

WISe-TF is focused on EM wave-based intelligent sensing technologies, standards and applications. By leveraging the basic principles of wireless sensing, and implementing hyper-intelligent resources and tools to improve wave interaction, signal processing, data analytics, etc., we are able to successfully digitalize, interpret, and monitor complex human behaviors and characteristics. This has critical applications in healthcare, in-cabin vehicle sensing, consumer electronics, and Industry 4.0.

WISe-TF Chair: Alex Qi, Mercku Inc., Canada

Call for Task Force: We are looking for more Hyper-Intelligence related TFs. HITC members are welcome to submit proposals that describing their cutting-edge researches and applications in the emerging Hyper-Intelligence or Super-Intelligence field for TFs. All the accepted TF will be listed in https://ieee-hyperintelligence.org/task-force.

The hit number of HITC webpage has reached over *98,000* so far, which has shown rapidly increasing interests from many people. We would like to extend our gratitude to all HITC members, for their invaluable help and productive advice in forming and organizing Hyper-Intelligence Technical Committee. Please kindly let us know if you have further suggestions to make HITC play one of leading roles in this emerging area.

We sincerely welcome more people to join the new TC for collaborative effort and exploration to the novel but challenging field in Hyper-Intelligence. Please feel free to promote, and invite your colleagues and friends who are interested in it to apply joining HITC by https://ieee-hyperintelligence.org/join_us.

HITC Newsletter Editors

Dr. Xiaokang Zhou, *Shiga University, Japan*

Dr. Wenjia Li, *New York Institute of Technology, United States*

Dr. Claudio Miceli de Farias, *Federal University of Rio de Janeiro, Brazil*

Dr. Antonio Guerrieri, *ICAR-CNR, Italy*