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Artificial IoT and Data Interoperability: Future Directions and Research Agenda

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Artificial IoT and Data Interoperability: Future Directions and Research Agenda

Panel

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ABSTRACT (REQUIRED)

The Internet of Things (IoT) has grown from devices being connected to and controlled through the Internet to autonomous platforms and networked devices that communicate with each other. The utilization of Artificial Intelligence with IoT (AIoT) has further increased the capabilities and services provided by devices but also imposed various challenges such as data interoperability. This panel is composed of leading experts in academia and industry that will discuss the current state and future directions of AIoT along with data interoperability to identify opportunities and challenges along with future directions in research.

Keywords (Required)

IoT Platforms, Artificial IoT (AIoT), Data Interoperability, 5G, Analytics

INTRODUCTION

The Internet of Things (IoT) are changing the way people interact with devices that are connected through networks collecting vast amounts of data about our data lives. Modern IoT devices are powered by three key technologies that include Artificial Intelligence (AI), 5G network, and big data (Ghosh, 2021). As of 2021, there are over 10 billion active IoT devices with a market value of more than \$742 billion with a predicted data generation reaching over 73 ZB by 2025 (Jovanović, 2021). The integration of AI with IoT (AIoT) enables devices to learn and continually increase in the type of services and capabilities that IoT can offer. With the continual increase of data generation, the ability to perform analytics is increasingly important to develop new insights in a continuously evolving connected society. IoT extends beyond human-to-device connectivity as devices across various platforms and services communicate with each other, increasing the need for data interoperability.

This panel discussion will explore new trends in IoT as emerging technologies such as AI and 5G continue to expand its capabilities. New opportunities and future directions will be explored while challenges impeding IoT's growth will be discussed. Based on the discussion with leading experts in industry, future insights will be presented that have practical and theoretical implications. We will conclude with closing remarks and recommendations for research.

PANEL OVERVIEW: POSITIONS AND PERSPECTIVES

This panel consist of a virtual roundtable discussion format to identify new trends and future directions related to AIoT. The moderator (Aaron French) will introduce the topic and provide key points to stimulate thinking and begin the discussion. Each panelist will provide valuable perspectives based on industry experience, providing valuable dialog for the audience on current and future trends related to AIoT. Each panelist will have about 15-20 minutes

to share their views and provide supporting or opposing views on AIoT. The initial question being discussed is as follows:

- What are current and future trends in AIoT and their impacts on business and society?

After the initial discussion, the panel will engage in a Q&A discussion with the audience facilitated by the moderator. Following the first round of questions and comments from the audience, the moderator will engage the panel with questions related to the panel members' expertise and thoughts on future research questions. This portion of the discussion will last roughly 10 minutes and conclude with closing remarks on the follow question:

- What research questions can academia address to inform business to provide practical relevance?

The panel will conclude with an open discussion with the audience where the audience is invited to ask any questions or comments for any of the members of the panel.

IoT Platforms and 5G

With the implementation of 5G and Edge Computing, IoT implementation will escalate providing more opportunities for IoT platforms to reach a larger scale. Industrial IoT will continue to grow in business while wearables and smart homes will become more prevalent in the consumer markets. With faster speeds and more bandwidth, IoT platforms will become smarter and more integrated as devices-to-device connections continue to grow. The deployment of 5G networks and IoT platforms will provide the foundation for future growth and ubiquitous connectivity.

Artificial IoT

The integration of AI and IoT (AIoT) will further expand the capabilities of smart devices and machines become more autonomous. Current trends of smart appliances, voice activated LCD displays, and massive object detection will see future enhancements of autonomous vehicles, natural language processing, and video analytics on the edge. AIoT will drastically change how people interact with their home, offices, and cities.

Data Interoperability

As IoT platforms continue to grow and become more connected, challenges related to data interoperability become more prevalent. Three primary functions have been proposed by the International Telecommunications Union (ITU) to address data interoperability: Syntactical interoperability, semantic interoperability, and object abstraction interoperability. These three functions are crucial for mediation between IoT platforms to support applications and services facilitated by IoT.

Artificial IoT and Analytics

Analytics is a crucial component of AIoT and the increased performance of IoT platforms. The continued growth of big data due to IoT and 5G provides ample opportunities and challenged for data analytics. AIoT relies heavily on analytics and machine learning to address customer needs and continue to improve the services provided. This also introduces ethical and privacy concerns as AIoT continually collects data about a variety of activities and habits in our daily lives.

PANEL PARTICIPANTS

Dr. Aaron M. French was Associate Professor of Management Information Systems at the University of New Mexico, before joining Kennesaw State University this Fall. He received his PhD in Business Information Systems at Mississippi State University. He is active in software development and the evaluation emerging technologies. His research has been published in the Journal of Information Technology, Information & Management, Decision Support Systems, Behaviour & Information Technology, Journal of CIS, and Communications of the AIS.

Dr. J. P. Shim is CIS faculty and KABC Director at Georgia State U. He is Professor Emeritus and was Professor/Notable Scholar/John Grisham Professor at Mississippi State U. He received his PhD from U of Nebraska-Lincoln and completed IT Executive Education at Harvard Business School. He received grants on telecom/RFID/e-business from NSF, Microsoft, U.S. SBA, and Mississippi IHL. He has published books and 100+ articles. He was visiting faculty at New York University, Chinese U of HK, and Georgia Tech. He is WTS/IEEE Program Chair.

Michael Haynes is a lead principal architect / practice lead, of IoT solutions in Retail at AT&T. He is also the founder and CEO of m1E Solutions that focuses on delivering mobile first, embedded, and IoT solutions for a wide

variety of industries including retail, consumer products, hospitality, manufacturing, logistics and transportation, oil and gas, government, and connected cities. Prior to starting m1E solutions, Michael was the Global VP and Chief Solutions Expert at SAP developing mobile and IoT solutions in retail.

Jim Lester is Chief Executive Officer at ThingTech, a top 10 innovative technology company in Georgia. They provide analytics for IoT that result in actionable insights spanning from device to decisions. Jim is responsible for the over strategic execution of the business to provide Enterprise Asset Management and Fleet Management solutions that are IoT data enabled. Prior to joining ThingTech, Jim was a founding member and managing partner of Canexus LLC, spent more than three and a half years as the Senior Vice President of Product Management, Strategy, and Marketing at Fiserv, and was the Vice President of Product Management at McKesson.

Nikos Kalatzis holds a Diploma in physics and an M.Sc. degree in Information Systems from the University of London, United Kingdom. Since 2005, he has been a research associate at the School of Electrical and Computer Engineering, of the National Technical University of Athens Greece. Since 2018 he works as a technical project manager in IoT industry with a focus in smart farming deployments along EU countries. His research interests include ICT systems interoperability, sensing technologies and decision support systems. He has participated in more than 15 international R&D projects and has published more than 40 scientific articles.

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