Introduction to the Smart Service Systems:
Analytics, Cognition and Innovation Minitrack

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Economic and societal well-being depend on innovations that help people use big data more intelligently. Human-centered, smart service systems for business and society can be characterized by: (1) the types of offerings to their customers and/or citizens, (2) the types of jobs or roles for people within them, and (3) the types of returns they offer investors interested in growth and development, through improved use of technology, talent, or organizational and governance forms, which create (dis) incentives that (re) shape behaviors. Innovators of smart service systems, including entrepreneurs, managers, and policymakers seek to improve quality-of-service for customers, quality-of-life for citizens, and/or quality-of-returns for investors.

Smart service systems are ones that continuously improve (e.g., productivity, quality, compliance, sustainability, etc.) and co-evolve with all sectors (e.g., government, healthcare, education, finance, retail and hospitality, communication, energy, utilities, transportation, etc.). Regional service systems include nations, states, cities, universities, and hospitals. Global service systems include multi-national businesses, professional associations, and NGOs. Natural or human-made disasters, technology failures, criminal activities, political collapse can disrupt or negatively impact quality-of-life for people living and working in service systems.

Using big data analytics and cognitive systems to improve decision-making service providers try to compete for the hearts, minds, and wallets of collaborators by (1) improving existing offerings, (2) innovating new types of offerings, (3) evolving their portfolio of offerings, and, (4) changing their relationships to others in the ecosystem in ways stakeholders perceive as more positive, sustainable, fair, or responsible.

The goal of this mini track is to explore the challenges, issues and opportunities related to innovation of smart service systems that enable value co-creation with analytics, cognitive and human systems. NSF and other funders see this research area as essential to build interdisciplinary innovation capacity (https://www.nsf.gov/pubs/2016/nsf16591/nsf16591.htm). This is the third time that we are offering this mini-track since 2015. The three papers accepted for the minitrack investigate these issues in different ways.

The first paper, titled "The Social Factory: Connecting People, Machines and Data in Manufacturing for Context-Aware Exception Escalation" by Laura Kassner, Pascal Hirmer, Matthias Wieland, Frank Steimle, Jan Königsberger and Bernhard Mitschang, introduces the Social Factory: an analytics supported social network to improve the connection between the persons working in the production environment, the machines producing the products, and the data that is created in the process. The proposed sample system is modular, easily configurable and easy to set up. They also provided a realistic use case scenario to illustrate the benefits of the Social Factory and have evaluated our concept and implementation against a set of requirements developed from the data and physical situation in a smart factory environment.

"Training IBM Watson using Automatically Generated Question-Answer Pairs" by Jangho Lee, Gyuwan Kim, Jaeyoon Yoo, Changwoo Jung, Minseok Kim and Sungroh Yoon, proposes an approach to apply automatically generated question-answer pairs to training Watson. Manually generating questions and answers in a large quantity is prohibitively time consuming and significantly limits the efficiency of Watson's training. Recently in natural language processing, a large-scale dataset of over 30 million question-answer pairs (generated by deep neural networks) was reported. They check the validity of the 30 million question-answer pairs through training Watson and demonstrate that using automatically generated questions with handcrafted questions can enhance Watson's overall performance.

In the last paper titled "Rebuilding Evolution: A Service Science Perspective" by Jim Spohrer, Md Abul Kalam Siddike and Youji Kohda, reviews the types of systems and emergent ecologies of entities, and provide answers to the following questions: What determines the speed limit of evolutionary processes, and might there be ways to speed up those processes for certain types of systems under certain conditions? Or even more simply, how rapidly can complex systems be rebuilt?

We hope you enjoy the papers and their presentation at the conference. We thank the authors for submitting their work to make this another engaging mini-track. We also thank the reviewers for their valuable feedback.

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