



The Convergent Innovation Webinar Series:

Inventing "One-World" Solutions for Lifelong Wellness and Sustainable Economic Growth

Towards AI-driven Food and Nutrition Science and Society: Opportunities and Challenges

Tome Eftimov is a senior researcher at the Computer Systems Department at the Jožef Stefan Institute. He is a visiting assistant professor at the Faculty of Computer Science and Engineering, Ss. Cyril and Methodius University, Skopje. He is a part of the ELIXIR Food and Nutrition Community. He was a postdoctoral research fellow at the Stanford University, USA, where he investigated biomedical relations outcomes by using AI methods. In addition, he was a research associate at the University of California, San Francisco, investigating AI methods for rheumatology concepts extraction from electronic health records. His research interests include natural language processing, statistical data analysis, metaheuristics, representation learning, and machine learning. He is an organizer of several workshops related to AI at high-ranked international conferences including the Big Food and Nutrition Data Management and Analysis at the IEEE BigData conference 2019, 2020, and 2021. He is a scientific coordinator of a EFSA funded project related to information extraction in food safety and actively participates in several European projects related to AI and food and nutrition data, including COMFOCUS.

March 17, 2022

11:00 am EST

(2 hrs in length)

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Chair: Laurette Dubé (Scientific Director of MCCHE)

Co-Chair & Moderator: John G. Keogh (Professor of Practice, MCCHE; Founder, Shantalla Inc.)

ABSTRACT: Lancet Planetary Health in 2019 noted that the focus of future improvements in our wellbeing and societies will depend on investigating the links between food systems, human health, and the environment. However, despite the large number of available resources and work done in the health and environmental domains, there is a lack of data and digital resources that can be utilized in the food and nutrition domain, as well as their interconnections. For the purpose of attaining human and societal wellbeing through advances in the field of artificial intelligence (AI), the talk will focus on opportunities for utilizing big data from food and nutrition and their interrelations with the biomedicine and the environment. Huge amounts of data containing valuable information is now available in various datasets, registries, and scientific and grey literature, which makes it possible to use advanced Artificial Intelligence (AI) methods. However, before applying AI methods on real-life data, that is heterogeneous (i.e., of different types and formats), unstructured (textual) data needs to be structured and normalized with other structured data. In this talk, we will explain AI methods and resources that can be used on different levels in the modeling process, starting from raw data to discovered knowledge. Finally, the existence of such methods and resources will be linked to several application scenarios of utilizing food and nutrition data in predicting emotional distress, COVID-10 mortality rate, and food chain traceability.

Dr. Eftimov's presentation will be supported by his collaborators: Barbara Koroušić Seljak and Gjorgjina Cenikj.

PANEL DISCUSSION: A panel with scientists, business and policy leaders will discuss how scientific and technological developments and ontologies bridging farm, food and human behavior, can accelerate the design and long-term performance of convergence platforms ecosystems targeting achievable and time-bound real-world solutions placing human and environmental health at the core. This will advance the design of integrative digital architecture and governance framework to scale up how real-world data generated by individuals and institutions within and across disciplines and sectors can contribute to a World reset on convergence economy, building upon the challenges and possibilities reviewed above. Capitalizing on digital transformation of science and society, convergence economy takes a person-centered approach to bridging organizations and systems across sectors and jurisdictions, fully acknowledging that developed and developing worlds share the same planet, for world-scale transformation toward sustainable prosperity and affordable nutrition and health.

ABOUT THE SERIES: The Convergent Innovation Webinar Series features cutting edge science, technology and innovation in agriculture, food, environment, education, medicine and other domains of everyday life where grand challenges lie at the convergence of health and economics. Powered by data science, artificial intelligence, and other digital technologies, this disciplinary knowledge bridges with behavioural, social, humanities, business, economics, social, engineering, and complexity sciences to accelerate real-world solution at scale, be it in digital or physical contexts. Initiated in the agri-food domain, the series is now encompassing other grand challenges facing modern and traditional economies and societies, such as ensuring lifelong wellness and resilience at both the individual and population levels.

Global Pulse Innovation Platform:



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Chair: Laurette Dubé, initially trained as a nutritionist, also holds degrees in finances (MBA), marketing (MPS), and behavioral decision-making/consumer psychology (PhD). Dr. Dubé is Full Professor at the Desautels Faculty of Management, McGill University. Her research focuses on the study of affects, behavioral economics, and neurobehavioral processes underlying consumption, lifestyle, and health behavior. Her translational research examines how such knowledge can inspire effective interventions. She is also the founder and scientific director of the McGill Centre for the Convergence of Health and Economics, a unique initiative to push the boundaries of science to tackle societal and economic challenges and foster individual and collective health and wealth.



Moderator: John G. Keogh is a strategist, C-level advisor and academic researcher with 25 years of executive leadership roles as Director, VP and SVP in global Supply Chain Management, Information Technology, Technology Consulting and global Supply Chain Standards. He advises the public and private sectors worldwide and is a regular subject matter expert on TV and Radio. Mr. Keogh is managing principal at Toronto-based, niche advisory and research firm Shantalla Inc. Mr. Keogh holds a PG diploma and an MBA in Management and an MSc in Business and Management Research in transparency and trust. He is currently completing doctoral research on transparency and trust in food chains at Henley School of Business, University of Reading.

Collaborators:



Barbara Koroušič Seljak works as a senior researcher at the Computer Systems Department at the Jožef Stefan Institute. Her main research areas are food and nutrition data management and knowledge discovery. She has a leading role in several EU-funded projects including H2020 FoodCloud, H2020 COMFOCUS, ESFRI Metrofood, EFSA CAFETERIA. She is a council member of the Slovenian Society for Clinical Nutrition.



Gjorgjina Cenikj is a student researcher at the Computer Systems Department at the Jožef Stefan Institute. She is currently pursuing a Masters degree in the area of Information and Communication Technologies, focusing on the development of Information Extraction methods for the domain of food and nutrition. Her main research interests include machine learning, natural language processing, representation learning and recommender systems.

Panellists:



Babak Ravandi is a postdoctoral research associate in the Network Science Institute and Physics Department at Northeastern University, Boston. He is focused on developing innovative and data-driven solutions to fix the food systems. Babak investigates how food ultra-processing impacts our society, food choices, and healthfulness, addressing the following question: how can we as individuals do our best with the current food supply? His ultimate goal is to encourage innovative thinking, eco-system thinking, and network thinking to understand and explore complex systems.



Valérie Orsat, Professor in Bioresource Engineering and Associate Dean of Student Affairs on the Macdonald Campus of McGill University, is a leader in state-of-the-art technologies for the processing/production of functional food ingredients for human health. She has worked internationally with major accomplishments and lasting impacts in “Millet processing in India”, “Consolidation of Food Security in South India” and “Microwave Assisted Processing in China”. She has received accolades both nationally and internationally recognizing her engineering approaches for functional foods and food security. She was the recipient of the 2008 Young Engineer of the Year Award and the 2015 John Clark Award, while she became a Fellow in 2017 of the Canadian Society for Bioengineering. She was also recognized in 2017 as a Woman of Innovation in Engineering while in 2021 she received the ‘Engineering and Physical Sciences’ Suffrage Science award, all in recognition of her exceptional contribution in the area of agri-food processing and post-harvest technology.



István Fehérvári is the Director for Data Science and Machine Learning at Loblaw Digital, the digital arm of Canada's largest and most successful retailer. Previously, Istvan worked at Amazon as Sr. Machine Learning Scientist leading the ML strategy on Brand Protection. Istvan holds a PhD in AI and has published several research papers in the field of robotics, machine learning, and computer vision on top venues like WACV and NeurIPS. He also filed several patents and worked on Emmy award winning technologies in video compression. Istvan is a passionate coder and has built products with software in (embedded) C, C++, Java, Lua, Rust, and Python and has contributed to several popular deep learning frameworks (PyTorch/MXNet).



Dr. Hande Kucuk McGinty is a Research Associate Professor at the Department of Chemistry and Biochemistry at Ohio University. She received a Ph.D. in Computer Science from University of Miami, but she has a long history of working with interdisciplinary teams. Her most recent research focuses on food and bio-ontologies and their applications for artificial intelligence and machine learning. She previously worked on designing and implementing ontologies such as BioAssay Ontology (BAO) and Drug Target Ontology (DTO) as well as generating methods on knowledge acquisition and representation. Dr. McGinty served several conferences and workshops. She is the general chair of the US2TS conference and is helping organize ICBO 2022 as well as several workshops.



Dr. Mikael Fogelholm is the Professor in Public Health Nutrition at the University of Helsinki. His research activities has long been on the inter-relationships between diet, physical activity and obesity. During the recent years, he has mostly done research on the use of grocery purchase data in analyses of food selection and nutrition policies, and on lifestyle and obesity in Sub-Saharan Africa. Mikael has also been in the project groups of the 2004 and 2012 Nordic Nutrition Recommendations. He has more than 220 original publications listed in PubMed. Mikael spends his free time mostly in the forests with his mountain bike.