RESEARCH SYMPOSIUM

The Role of Artificial Intelligence and Digital Tools in Health Research

Integration of structured biomedical knowledge and multiomic patient data for rare genetic disorders

Panelist: Aaron J. Masino, Associate Professor, School of Computing

AI-assisted ultrasound imaging for quantitative assessment of muscle and tendon health

Panelist: Kuang-Ching Wang, Endowed Chair, Electrical & Computer Engineering

Optimal Fractionation in Radiotherapy

Panelist: Archis Ghate, Fluor Endowed Chair, Industrial Engineering

Scaling Proactive Systems Learning in Hospitals Using Large Language Models

Panelist: Sudeep Hegde, Assistant Professor, Industrial Engineering

Artificial intelligence (AI) and digital tools relying on AI have already begun transforming the delivery of healthcare to patients and the performance of healthcare systems. The application of AI to the health sciences encompasses a broad range, from using AI to improve the accuracy of diagnosing the functioning of internal organs, to better understanding the performance of healthcare systems. The presentations within the proposed panel session illustrate the breadth of AI applications and contributions to AI and Health being made by Clemson Faculty.

Dr. Aaron Masino will first present his research on the use of AI in the diagnosis of rare genetic disorders (RGD). He will discuss the efforts of his team to develop AI approaches that integrate information rich biological ontologies with patient multi-omic data to support RGD diagnosis. Dr. Kuang-Ching Wang will then present his research on the use of AI-assisted ultrasound imaging for the quantitative assessment of muscle and tendon health, further illustrating the use of AI for diagnosis and assessment. Dr. Archis Ghate will present his research using mathematical formulations and solution methods for helping to address the optimal fractionation problem (the optimal number of treatment sessions and the radiation dose per session) in using radiotherapy to treat tumors. Finally, reflecting a more macrolevel use of AI, Dr. Sudeep Hegde will present his research on the use of large language models to analyze themes of safety incident reports reflecting medical errors, as well as themes of positive adaptation in the everyday work of healthcare professionals.