Stony Brook University
The State University of New York

Department of Biomedical Informatics
School of Medicine and College of Engineering and Applied Sciences

SPECIAL SEMINAR

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Multigranular Artificial Intelligence Methods for Complex Systems
Friday, May 24, 2024
1:00 pm – 2:00 pm

Join Zoom Meeting:
https://stonybrook.zoom.us/j/91517347188?pwd=L2h5ckczRmEvazdqdHoxOWlrTUl4Zz09
Meeting ID: 915 1734 7188
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Abstract: Infectious outbreaks in confined environments, such as buildings or passenger transport, present a tremendous risk of rapid infection spread due to the high concentration of individuals. This is especially important for novel pathogens, which can spread very quickly in enclosed spaces similar to the 2009 H1N1 pandemic and the recent pandemic of SARS-CoV-2. Hence, modeling infection transmission is important for the prevention of epidemics and maintaining public health.

Norwalk virus is one such viral pathogen, and is the leading cause of acute gastroenteritis globally, among children and adults. Norovirus has a tremendous global burden causing about 200,000 deaths annually and $4 billion dollars in economic impact. Each year, there are major norovirus and other pathogen outbreaks on cruise ships, and they are extremely difficult to manage because of factors such as close quarters, frequently contaminated surfaces and limited medical facilities. Unfortunately, current epidemiological models study summarized infection dynamics and do not consider detailed models of the environment, population behavior and pathogen transmission.

A computational framework for real-time simulation of infection dynamics on a passenger vessel is proposed. This modeling framework integrates three major components, a geographic information system (GIS), AI agent-based simulation, virologic models and containment protocols. The accuracy of the system was evaluated against real world data and was shown to be significantly better than current compartmental models. The system was also able to validate the efficacy of various containment protocols.

Bio: Dr. Suhas Srinivasan is a Principal Scientist at Stanford University, leading computational research in the Epithelial Biology Program, Center for Personal Dynamic Regulomes and the RNA Medicine Program. His interdisciplinary research is centered on the development of new analytical and artificial intelligence methods to address diverse problems in life sciences, and other areas such as manufacturing and industrial engineering. Dr. Srinivasan's research has been published in top journals such as Cell, Nature Methods, and RNA, and holds a patent for a machine learning algorithm. His research has been recognized with competitive grants from industry, excellence awards and covered in national and international media such as The Wall Street Journal, The New York Times, The Washington Post and others. Prior to academia, he was a full-stack software engineer at several leading enterprise software companies