



Stony Brook University

Institute for Engineering Driven-Medicine

Workshop Agenda

Hilton Garden Inn at Stony Brook University

Time: 8:30 to 4pm - September 21, 2023

Core topic areas for workshop:

- Applications of artificial intelligence in clinical decision support, prediction of health system and emergency department demand, alerts such as sepsis prediction, health care quality analyses
- Generative artificial intelligence, deep learning and machine learning applied to biomedical imaging
- Architectures and approaches for multi-modal and multi-task learning – e.g. integrating electronic data, radiology, pathology, single-cell, RNA-seq, and molecular data
- Biomedical methods for and applications of large data analysis
- Biomedical image analysis and image reconstruction methods – super-resolution, removal of artifacts, imputation of high-resolution information from low-resolution

8:30am

Welcome Breakfast

8:30am – 8:45am

Opening Remarks

College of Engineering and Applied Sciences
Dean, Andrew C. Singer, PhD

Renaissance School of Medicine,
Dean, Peter Igarashi, MD

8:45am -10:00am:

**Innovative AI algorithms (1 hour, 15 min.)
Session Chair: Fusheng Wang**

- 8:45am – 9:00am

Ramana Davuluri, PhD (15 mins)
Professor, Department of Biomedical Informatics

Presentation: Proposed topic: Genomic Language Model – DNABERT application on interpretation and characterization of cancer genomes.

- 9:00am – 9:15am

Fusheng Wang, PhD (15 mins)
Professor, Department of Biomedical Informatics

Presentation: Towards Interpretable Deep Learning for Early Disease Prediction Using Electronic Health Records.

- 9:15am – 9:30am

Prateek Prasanna, PhD (15 mins)
Assistant Professor, Department of Biomedical Informatics

Presentation: Collaborative Medical Vision for Precision Medicine

- 9:30am – 9:45am

Tengfei Ma, PhD (15 mins)
Assistant Professor, Department of Biomedical Informatics

Presentation: Deep Learning for Healthcare Data Analysis

- 9:45am – 10:00am

Chao Chen, PhD (15 mins)
Assistant Professor, Department of Biomedical Informatics

Presentation: Spatial and topological analysis of tumor microenvironment.

- 10:00am – 10:30am Break (30min)

10:30am -11:30am: AI Methods – interaction with physical world (1 hour, 15 min.) Session Chair: Yi Xian Qin

- 10:30am – 10:45am Yingtian Pan, PhD (15 mins)
Professor, Department of Biomedical Engineering

Presentation: Deeping learning enhanced optical Doppler tomography (ODT).

- 10:45am – 11:00am Jun Wang, PhD (15 mins)
Associate Professor, Department of Biomedical Engineering

Presentation: Advancing the Biomedical Sciences by Accessible Single-Cell Proteomics

- 11:00am – 11:15am Zhaozheng Yin, PhD (15mins)
SUNY Empire Innovation Associate Professor,
Department of Biomedical Informatics

Presentation: Annotation-efficient Machine Learning for Biomedical Image Analysis

- 11:15am – 11:30am Yi-Xian Qin, PhD (15 mins)
SUNY Distinguished Professor,
Chair, Department of Biomedical Engineering
Co-Director, Institute for Engineering-Driven
Medicine

Presentation: Mechanobiology in biological system using single-cell and RNA-seq analyses and modeling

- 11:30am – 11:45am Break (15min)

11:45am-12:30pm:

**Integrating AI-ML in Biomedical Simulations
and Experiments (45 min.)
Session Chair: TBD**

- 11:45am – 12:00pm

Jawaad Sheriff, PhD (15 mins)
Research Assistant Professor,
Department of Biomedical Engineering

Presentation: AI and ML in multiscale models of thrombosis: integrating in vitro imaging and platelet biomechanics across the lifespan.

- 12:00pm – 12:15pm

Danny Bluestein, PhD (15 mins)
SUNY Distinguished Professor
Department of Biomedical Engineering

Presentation: Utilizing AI-ML to accelerate multiscale simulations on HPC clusters, and DL to reconstruct patient-specific models from CT scans for simulating transcatheter aortic valve replacement (TAVR) procedures.

12:15pm – 12:30pm

General wrap up and discussion re: morning sessions (15 mins)

12:30pm-1:30pm

Networking Lunch (1 hour)

1:30pm - 2:30pm:

AI applications in translational biomedical research (1 hour) Session Chair: Joel Saltz

- 1:30pm – 1:45pm Rajarsi Gupta, MD, PhD (15 mins)
Assistant Professor, Department of Biomedical Informatics

Presentation: Cancer Immunopathomics
- 1:45pm – 2:00pm Tahsin Kurc, PhD (15 mins)
Research Associate Professor
Vice Chair, Department of Biomedical Informatics

Presentation: Analysis of Temporal Data in Clinical Decision Making and Research
- 2:00pm – 2:15pm Janos Hajagos, PhD (15 mins)
Research Assistant Professor,
Chief of Data Analytics,
Department of Biomedical Informatics

Presentation: Accelerating the use of machine learning in the clinical domain by using common data models
- 2:15pm – 2:30pm Joel Saltz, MD, PhD (15 mins)
SUNY Distinguished Professor,
Cherith Endowed and Founding Chair,
Department of Biomedical Informatics
Co-Director of Institute for Engineering- Driven Medicine

Presentation: AI and Imaging Biomarkers
- 2:30pm-2:45pm Break (15min)

2:45pm-3:30pm:

Panel Discussion (1hour, 15 mins.)

Panel Speakers:

Demetri Giannikopoulos from AIDOC
-triage and notification systems for clinical use cases in Neuro, Pulm, Orth, etc

Jonathan Buscaglia, CMO SBM
-SBM lens on AI

Mida Pezehkian from A.Team
-Virtual teams that provide resources to support projects like AI development

Microsoft AI division
-how other orgs are partnering with tech companies

3:30pm – 4:00pm

Summary and closing remarks