2019 FALL PRIMES CONFERENCE
COMPUTER SCIENCE & COMPUTATIONAL BIOLOGY

Program for Research In Mathematics, Engineering, and Science
for High School Students

Photo: Slava Gerovitch

Sunday, October 20

Computer Science Section

9:00 am <u>Welcoming remarks</u>

Dr. Slava Gerovitch, PRIMES Program Director
Prof. Srini Devadas, MIT EECS Department

9:15 am <u>Session 1</u>

Ezra Gordon, *Improving round complexity of Byzantine Broadcast under dishonest majority* (mentor Jun Wan)
Linda Chen, *Random graphs and all-to-all communication* (mentor Jun Wan)
Sanath Govindarajan and Walden Yan, *Achieving fast fully homomorphic encryption with graph reductions* (mentor William Moses))

10:20 am <u>Session 2</u>

Patrick Zhang, *Privacy-preserving similarity search using learned indexes* (mentor Kyle Hogan)
Ethan Mendes, *Towards a certified defense for audio adversarial examples* (mentor Kyle Hogan)
Andrew Shen, *Towards verifying application isolation for cryptocurrency hardware wallets* (mentor Anish Athalye)

11:15 am <u>Session 3</u>

Michael Gerovitch, *Environment-aware pedestrian trajectory prediction for autonomous driving* (mentor Dr. Igor Gilitschenski)
Yuxuan Chen, *A deep learning approach to end-to-end autonomous driving using event-based vision* (mentors Dr. Igor Gilitschenski and Alexander Amini)
Aditya Saligrama, *Can robust ensembling schemes improve defenses against adversarial inputs?* (mentor Guillaume Leclerc)

12:10 pm <u>Session 4</u>

Alek Westover, *Cache-efficient parallel partition algorithms* (mentor William Kuszmaul)
Alex Ding, *An evaluation of UPC++ using distributed parallel graph algorithms* (mentor Dr. Yan Gu)
Neel Bhalla, *Constructing workflow-centric traces in real time for the Hadoop File System* (mentor Prof. Raja Sambasivan, Tufts University)
Jerry Xu, *Time – What happens if the world spins backwards?* (mentor Prof. Ari Trachtenberg, Boston University)

Computational Biology Section

2:00 pm <u>Welcoming remarks</u>

Prof. Leonid Mirny, MIT Physics Department

2:05 pm <u>Session 5</u>

Neil Chowdhury, *A method to recognize universal patterns in genome structure using Hi-C* (mentor Sameer Abraham)
Shiv Khandelwal, *Genome-wide flame feature detection pipeline for Hi-C chromatin conformation maps* (mentor Sameer Abraham)
Jason Yang, *The relationship between gene expression correlation and 3D genome organization* (mentors Sameer Abraham and Martin Falk)
Vishnu Emani and Kevin Zhao, *The role of protein occupancies in DNA compartmentalization* (mentors Sameer Abraham and Martin Falk)

3:20 pm <u>Session 6</u>

Andrew Zhang, *An explainable machine learning platform for antimicrobial resistance prediction and resistance gene identification* (mentor Prof. Gil Alterovitz)
Alan Qi and Powell Zhang, *Using feature selection to identify gene significance in drug-resistant tuberculosis* (mentor Prof. Gil Alterovitz)
Benjamin Chen, Neil Malur, and Hari Narayanan, *A novel framework to improve the structure of clinical trials eligibility criteria* (mentor Prof. Gil Alterovitz)
Ian Balaguera, *Implementing a patient-clinician interface for biomedical templates* (mentor Prof. Gil Alterovitz)

4:40 pm <u>Session 7</u>

Jonathan Yin, *Latent representations of chemical ligands to predict combinatorial receptor-ligand interactions* (mentor Dr. Hattie Chung, Broad Institute)
Sarah Chen, *Retained introns are translated and contribute antigens to the MHC I immunopeptidome* (mentors Dr. Tamara Ouspenskaia and Dr. Travis Law, Broad Institute)
Mikhail Alperovich, *Data driven quality control for single-cell RNA sequencing analysis* (mentor Dr. Ayshwarya Subramanian, Broad Institute)