Overview

Dr. Nehorai graduated 32 Ph.D. students of whom, 11 are faculty members, 3 are in government research labs, and 17 in industry (including 4 in finances, and 2 in start-ups). Recent employers include Google, Facebook, Oracle, Walmart Labs, and Exploratory start-up.

Research themes: We develop models of complex systems, use statistical signal processing, machine learning, imaging, and optimization to analyze data and solve important societal problems.

Network Science

- Community detection: Identification of mesoscale structures that drive the behavior of complex systems.
  Student: Zhenqi Lu.
- Graph classification: Quantification of the similarity between graphs.
  Student: Zhen Zhang.

Healthcare Management

- Hospital readmission: Development of machine learning models for readmissions risk based on patient data, and determining optimal treatment strategies for high risk patients.
  Student: Eric Cawi.

Biomedicine

- Uterus contraction modeling: Multi-scale (cell to tissue to organ) electrophysiology dynamic system modeling of uterine contractions to predict labor.
  Students: Mengxue Zhang, Yiqi Lin.

- Biomedical imaging: Estimation of source current density during uterine contractions.
  Student: Zhen Zhang.

Multi-Media Data Analysis

- Machine learning: Transfer learning, image classification, and network structure analysis.
  Student: Zhen Zhang.

Sensing and Radar

- Array processing: Statistical performance analysis of co-prime arrays for finding more sources than sensors.
  Student: Mianzhi Wang.
- Cognitive radar networks:
  - Active recursive Bayesian estimation for dynamic target tracking.
  - Adaptive detection for targets in the nonstationary environments.
  Student: Yijian Xiang.
- Synthetic aperture radar: Image reconstruction using robust PCA.
  Student: Yan Huang.

Health Monitoring

- Parkinson disease: Modeling, detecting, and tracking of freezing of gait in Parkinson disease.
  Student: Prateek Gundannavar.
- Alzheimer disease: Sleep and EEG biomarkers of Alzheimer disease.
  Student: Prateek Gundannavar.

Entrepreneurship Opportunities

Examples: Biomedical imaging, health care management, and remote health monitoring.

Best Student Paper Awards

- Zhao Tan, IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing, 2013.

Group Photo

Thanksgiving dinner, November 26, 2015.

From left to right: Yijian Xiang, Zhen Zhang, Hesam Mazidi, Mianzhi Wang (Ph.D. 2018), Johan Wahlström (Ph.D. 2018), Dr. Nehorai, Prateek Gundannavar, Mengxue Zhang (Ph.D. 2018), Jichuan Li (Ph.D. 2016), Alex Cassidy (Ph.D. 2016).