Metehan Cekic **PhD student**

CONTACT INFORMATION

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EDUCATION

University of California Santa Barbara, Santa Barbara, US **2017 - Present**
Ph.D. and M.S., *Electrical and Computer Engineering*

- Supervisor: Prof. Upamanyu Madhow
- Area: Machine Learning, Deep Learning and Signal Processing
- GPA: 4.0/4.0

Bogazici University, Istanbul, Turkey **2012 - 2017**
B.S., *Electrical & Electronics Engineering*, **B.S.** *Physics*

- CGPA: 3.7/4.0, Dean's High Honors List

University of California Los Angeles, Los Angeles, US **2015 - 2016**
B.S. Study Abroad, *Electrical and Computer Engineering*

- GPA: 3.9/4.0

RESEARCH AND PROJECTS

Advisor: Prof. Upamanyu Madhow, UC Santa Barbara

- **Radio Frequency (RF) Machine Learning (ML)** **2018 - present**
  - Showed that complex-valued CNNs can learn RF signatures to distinguish between devices sending exactly the same message. Demonstrated effectiveness for two different wireless protocols: WiFi and ADS-B.
  - Studied robustness to spoofing, and to channel variations, noise and frequency drift occuring in data collected over different days/locations.
- **Adversarial Machine Learning** **2019 - present**
  - We investigate neuro-inspired defense mechanism, starting from the observation that human vision is virtually unaffected by adversarial examples designed for machines.
  - We aim to reject ℓ_∞ bounded adversarial perturbations before they reach a classifier DNN, using an autoencoder with characteristics commonly observed in biological vision: sparse overcomplete representations, randomness due to synaptic noise, and drastic nonlinearities.
- **Reinforcement Learning for Turkish Card Game Called "Batak"** **2019**
  - Programmed the game and the environment from scratch, and developed a competitive AI by utilizing LSTM and fully connected neural networks specifically designed for the game.
  - Compared different architectures and got a performance close to human-level.

COMPUTER SKILLS

Languages: Python, MATLAB, C/C++, Bash.
Libraries: Tensorflow, Pytorch, Scikit-learn, Numpy.

RELEVANT COURSEWORK

- Machine Learning: A Signal Processing Perspective
- Deep Learning for NLP
- Theoretical Machine Learning
- Pattern Recognition
- Advanced Topics in Computer Vision
- Information Theory
- Matrix Analysis and Computation
- Game Theory
- Convex Optimization

PUBLICATIONS

- **M. Cekic***, S. Gopalakrishnan*, U. Madhow, "Robust Wireless Fingerprinting: Generalizing Across Space and Time", under review at *IEEE Transactions on Information Forensics & Security*.
- C. Bakiskan*, **M. Cekic***, A. D. Sezer*, U. Madhow, "Neuro-Inspired Sparse Preprocessing (NeurISP) Defense Against Adversarial Perturbations", submitted to *Conference on Neural Information Processing Systems (NeurIPS)*, Vancouver, Canada, Dec 2020.

* Joint first authors.

- S. Gopalakrishnan*, **M. Cekic***, U. Madhow, "Robust Wireless Fingerprinting via Complex-Valued Neural Networks", *IEEE Global Communications Conference (Globecom)*, Hawaii, Dec. 2019.
- S. Gopalakrishnan, Z. Marzi, **M. Cekic**, U. Madhow, R. Pedarsani, Robust Adversarial Learning via Sparsifying Front Ends, under review at *Elsevier Signal Processing (SIGPRO)*.
- C. Bakiskan, S. Gopalakrishnan, **M. Cekic**, U. Madhow, R. Pedarsani, "Polarizing Front Ends For Robust CNNs", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Barcelona, Spain, May 2020.

Industrial Internships

Speech Enabled Software Technologies (SESTEK), Istanbul **Summer 2015**

- *Speech Processing Engineer*: Worked on how to detect edited tapes and speech processing techniques used in forensic incidents.

Teaching

Teaching Assistant experience in UCSB: Assisted lead professors with tasks related to administering college level courses and led problem solving class discussions.

– *Graduate level courses*: ECE 283: Machine Learning

– *Undergraduate level courses*: ECE 130B: Signal Analysis, ECE 139: Probability Theory

Honors and Awards

UCSB, Outstanding Electrical and Computer Engineering Teaching Assistant Award, 2018

Turkish Education Association, Outstanding Success Scholarship, 2012

Ranked 87^{th} out of 2 million students in Turkish University Entrance Exam, 2012

Akdeniz University, Mathematics olympiads, Honorable Mention, 2010

TUBITAK, 13^{rd} National Mathematics Olympiads, Silver Medal, 2008

* Joint first authors.