Metehan Cekic PhD student

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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 B.S. Study Abroad, Electrical and Computer Engineering

2015 - 2016

• 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 occurring 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.

- Advanced Topics in Computer Vision

- 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

ive – Information Theory

Deep Learning for NLP
 Matrix Analysis and Computation

- Theoretical Machine Learning - Game Theory

- Pattern Recognition - 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, "A Neuro-Inspired Autoencoding Defense Against Adversarial Perturbations", submitted to AAAI Conference on Artificial Intelligence, Feb 2021.

^{*} 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 EXPERIENCE

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 87th out of 2 million students in Turkish University Entrance Exam, 2012
Akdeniz University, Mathematics olympiads, Honorable Mention, 2010
TUBITAK, 13rd National Mathematics Olympiads, Silver Medal, 2008

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