Metehan Cekic PhD Candidate

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 B.S. Study Abroad, Electrical and Computer Engineering

2015 - 2016

• GPA: 3.9/4.0

Professional EXPERIENCE

Amazon, Sunnyvale, US Supervisor: Oguz Elibol

Summer 2021

• Applied Scientist Intern: In progress.

Graduate Research Assistant, UCSB, Santa Barbara, US

2018 - Present

Advisor: Prof. Upamanyu Madhow

- Radio Frequency (RF) Machine Learning (ML): 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: 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.

Speech Enabled Software Technologies (SESTEK), Istanbul, Turkey

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

Side Projects

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

- Information Theory

• Compared different architectures and got a performance close to human-level.

Computer SKILLS

Languages: Python, MATLAB, C/C++, Bash.

Machine Learning: A Signal Processing Per-

Libraries: Pytorch, Tensorflow, Scikit-learn, Numpy, Pandas.

Relevant Coursework

Deep Learning for NLP

spective

- Optimal Estimation and Filtering

- Theoretical Machine Learning - Game Theory

- Pattern Recognition - Convex Optimization

PUBLICATIONS

- M. Cekic*, S. Gopalakrishnan*, U. Madhow, "Wireless Fingerprinting via Deep Learning: The Impact of Confounding Factors" submitted to *IEEE Asilomar Conference on Signals, Systems, and Computers*.
- C. Bakiskan*, M. Cekic*, A. D. Sezer*, U. Madhow, "Sparse Coding Frontend For Robust Neural Networks", International Conference on Learning Representations (ICLR), Workshop on Security and Safety in Machine Learning Systems, May 2021.
- C. Bakiskan*, M. Cekic*, A. D. Sezer*, U. Madhow, "A Neuro-Inspired Autoencoding Defense Against Adversarial Perturbations", to appear in *IEEE International Conference on Image Processing (ICIP)*, Anchorage, Sept. 2021.
- 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", Preprint, Arxiv.
- 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.

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, 13rd National Mathematics Olympiads, Silver Medal, 2008

^{*} Joint first authors.