MEHMET SAYGIN SEYFIOĞLU

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TOBB ETU
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OBJECTIVE & SUMMARY

My objective is to actively engage in research activities as a PhD student and later as a post-doctoral researcher mainly in the field of Machine Learning. My former research lies at the intersection of Signal Processing and Computer Vision. I also have research experience in Natural Language Processing and Hyperspectral Image Processing.

EDUCATION

M.Sc. **2015 - 2017**

TOBB University of Economics and Technology, Ankara, Turkey
Electrical and Electronics Engineering
Cumulative GPA **:** 3.86/4.00
Advisor **:** Prof. Sevgi Zübeyde Gürbüz
Co-Advisors **:** Prof. Ayşe Melda Yüksel Turgut, Prof. Ahmet Murat Özbayoğlu
Thesis Title **:** Deep Neural Network Initialization and Training Methodologies for Radar Micro-Doppler Signature Classification
Research Output: 3 first-authored journal papers (among which 2 are in IEEE Transactions with highest h-5 index according to Google Scholar Metrics for Radar, Positioning & Navigation) and 7 conference papers all related to machine learning research (one submitted to NAACL). Also started writing a chapter as an invited author for an IET book entitled *Deep Neural Network Design for Radar Applications.*

B.Sc. **2010 - 2015**

TOBB University of Economics and Technology, Ankara, Turkey
Electrical and Electronics Engineering
Cumulative GPA **:** 3.42/4.00 (Ranked 5th out of 80)
GPA (last year 54 credits) **:** 3.93/4.00
Advisor **:** Prof. Bülent Tavlı
Senior Design Project **:** Auto-Tune: A Voice Pitch Tuner
Research Output **:** 4 international conference papers related to remote sensing in various venues across Europe and Canada.

RESEARCH AND WORKING EXPERIENCE

Defense Technologies Engineering and Trade Inc. (STM), Ankara, Turkey
Big Data Products and Services Group

- Data Scientist *Dec. 2016 – Present*
  - Developed the machine learning modules of state-of-the-art NLP research that aims to build an intelligent tool to generate relevant network vulnerability test (NVT) scripts for desired common vulnerabilities and exposures (CVE).
    - Implemented a deep learning model that predicts the exploitability score of vulnerabilities for the given CVE description text.

        - Implemented a retrieval-based algorithm for code generation based on word and document embeddings.
        - Implemented a hybrid model that uses both handcrafted and neural features for detection of cyber security events from noisy short text. (in submission to NAACL19)
    - Prepared and taught Introduction to Deep Learning and Introduction to Machine Learning courses covering both theoretical and practical aspects of deep/machine learning for Middle East Technical University Technopolis' employees.
    - Developed a driver behavior analysis model for TEMSA, a private bus manufacturer, by using both signal processing and machine learning algorithms.
    - Implemented a named entity recognition model for the recognition of cyber security related named entities by combining bidirectional long-short term memory networks and convolutional neural networks.
    - Developed a sentiment analysis model from customer reviews for Turkish Airlines.

TOBB ETU, Ankara, Turkey
Cognitive Radar and Remote Sensing Group
Advisors: Prof. Sevgi Zübeyde Gürbüz, Prof. Ahmet Murat Özbayoğlu, Prof. Ayşe Melda Yüksel Turgut

- Research and Teaching Assistant *May 2015 – Dec. 2016*
    - Mainly conducted research on micro-Doppler analysis and machine learning for human activity recognition in collaboration with Prof. Moeness G. Amin's group at Villanova University/USA.
        - Contributed to the development of a novel simulated dataset for initialization of deep residual networks for micro-Doppler gait classification.
        - Experienced implementing novel deep architectures in both low and high level frameworks such as Tensorflow and Keras.
    - Implemented state-of-the-art handcrafted features for micro-Doppler gait classification under low SNR in a project led by ASELSAN, the largest defense industry company in Turkey.
    - Invited as a visiting researcher for developing the machine learning model for the classification of bird species by using radar in Prof. Felix Liechti's group at Swiss Ornithological Institute/Switzerland.
- Undergraduate Research Assistant *May 2013 – May 2015*
    - Mainly worked in Advanced Imaging Technologies (TUYGUN) project led by HAVELSAN, one of the largest defense industry companies in Turkey.
        - Proposed a novel hybrid target detection algorithm that combines both spatial and spectral features of hyperspectral images.
        - Performed research based on data fusion where hyperspectral and lidar data are fused to simulate airborne radar clutter.
    - Involved in writing of 4 international conference papers relating image/hyperspectral image processing as an undergraduate student. Also delivered an oral and a poster presentation in international conferences as a senior student.

The Scientific and Technological Research Council of Turkey (TÜBİTAK) Space Technologies Research Institute (UZAY), Ankara, Turkey
Remote Sensing Group

- Research Intern Jan. 2014 – April 2014
    - Implemented pan-sharpening algorithms for the national earth observation satellite RASAT.
    - Implemented a state of the art haze removal algorithm for RASAT satellite imagery.

The Scientific and Technological Research Council of Turkey (TÜBİTAK) Space Technologies Research Institute (UZAY), Ankara, Turkey
Remote Sensing Group

- Research Intern May 2013 – Aug. 2013
    - Performed research based on machine learning and image processing.

TEACHING EXPERIENCE

Teaching Assistant, TOBB University of Economics and Technology, Electrical and Electronics Engineering

ELE 361	- Communication Systems & Laboratory	2016-2017 Fall
ELE 465	- Radar & Sonar Systems	2015-2016 Summer
ELE 371	- Signals & Systems	2015-2016 Spring
ELE 202	- Circuit Theory II & Laboratory	2015-2016 Fall
ELE 201	- Circuit Theory & Laboratory	2014-2015 Summer

Instructor, Defense Technologies Engineering and Trade Inc. (STM) Academy

Machine Learning -	https://www.stmakademi.com/en/training/machine-learning	2017 December
Deep Learning -	https://www.stmakademi.com/en/training/deep-learning	2018 May

PUBLICATIONS & REVIEWS

Review: Contributed as a reviewer for the IEEE Sensors Journal, IEEE Geoscience and Remote Sensing Letters and various other conference papers.

Google Scholar Profile: https://scholar.google.com.tr/citations?user=65TuoYUAAAAJ&hl=en

Thesis

1. **M. S. Seyfioğlu**, "Deep Neural Network Initialization and Training Methodologies for Radar Micro-Doppler Signature Classification", Master's Thesis, TOBB University of Economics and Technology, December 2017.

Book Chapter

1. S. Z. Gürbüz, B. Erol, **M. S. Seyfioğlu** and M. G. Amin, "Robustness of Kinematic Approaches to Train DNNs for Micro-Doppler Classification Under Low Sample Support," invited chapter in Deep Neural Network Design for Radar Applications, IET (In Preparation, expected to be published in early 2020)

Journals

1. **M. S. Seyfioğlu**, B. Erol and S. Z. Gürbüz and M. G. Amin " DNN Transfer Learning from Diversified Micro-Doppler for Motion Classification." in *IEEE Transactions on Aerospace and Electronic Systems* – https://arxiv.org/abs/1811.08361

2. **M. S. Seyfioğlu**, A. M. Özbayoğlu and S. Z. Gürbüz "Deep Convolutional Autoencoder for Radar-Based Classification of Similar Aided and Unaided Human Activities." in *IEEE Transactions on Aerospace and Electronic Systems*, January 2018 *Link:* http://ieeexplore.ieee.org/document/8283539/

3. **M. S. Seyfioğlu** and S. Z. Gürbüz "Deep Neural Network Initialization Methods for Micro-Doppler Classification with Low Training Sample Support." *IEEE Geoscience and Remote Sensing Letters* 14.12 (2017): 2462-2466. *Link:* http://ieeexplore.ieee.org/document/8119733/

Conference Papers

1. S. Yağcıoğlu, **M. S. Seyfioğlu,** B. Bardak, B. Çıtamak, S. Güldamlasıoğlu, A. Yüksel, E. İ. Tatlı "Detecting Cybersecurity Events from Noisy Short Text" NAACL. 2019. (*Submitted)*

2. **M. S. Seyfioğlu**, B. Erol, S. Z Gürbüz, M. G. Amin, "Diversified radar micro-Doppler simulations as training data for deep residual neural networks." Radar Conference (RadarConf18), 2018 IEEE. Link: https://ieeexplore.ieee.org/abstract/document/8378629/

3. B. Erol, **M. S. Seyfioğlu,** S. Z Gürbüz, M. G. Amin, "Data-driven cepstral and neural learning of features for robust micro-Doppler classification." Radar Sensor Technology XXII. Vol. 10633. International Society for Optics and Photonics, 2018. *Link: https://www.spiedigitallibrary.org/conference-proceedings-of-spie/10633/106330J/Data-driven-cepstral-and-neural-learning-of-features-for-robust/10.1117/12.2304396.short?SSO=1*

4. **M. S. Seyfioğlu**, M. U. Demirezen, "A Hierarchical Approach for Sentiment Analysis and Categorization of Turkish Written Customer Relationship Management Data," *2017 IEEE Federated Conference on Computer Science and Information Systems (FedCSIS)*, Prague. Link: http://ieeexplore.ieee.org/document/8104566/

5. **M. S. Seyfioğlu**, A. Serinöz, A. M. Özbayoğlu, S. Z. Gürbüz, "Feature diverse hierarchical classification of human gait with CW radar for assisted living," *2017 IET International Conference on Radar Systems*, Belfast. Link: http://digital-library.theiet.org/content/conferences/10.1049/cp.2017.0379

6. **M. S. Seyfioğlu**, S. Z. Gürbüz, A. M. Özbayoğlu and A. M. Yüksel, "Deep learning of micro Doppler features for aided and unaided gait recognition," *2017 IEEE Radar Conference (RadarConf)*, Seattle, WA, USA, 2017, pp. 1125-1130. doi: 10.1109/RADAR.2017.7944373. Link: http://ieeexplore.ieee.org/document/7944373/

7. **M. S. Seyfioğlu**, Ş Bayındır and S. Z. Gürbüz, "Automatic spectral signature extraction for hyperspectral target detection," *2015 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Milan, 2015, pp. 4452-4455. Link: http://ieeexplore.ieee.org/document/7326815/

8. **M. S. Seyfioğlu** and S. Z. Gürbüz, "Airborne radar clutter simulation using hyperspectral and LiDAR imagery," *2014 IEEE Geoscience and Remote Sensing Symposium*, Quebec City, QC, 2014, pp. 2938-2941. Link: http://ieeexplore.ieee.org/document/6947092/

9. M. Teke, **M. S. Seyfioğlu**, A. Ağçal and S. Z. Gürbüz, "Optimal pansharpening of RASAT satellite imagery," *2014 22nd Signal Processing and Communications Applications Conference (SIU)*, Trabzon, 2014, pp. 1967-1970. Link: http://ieeexplore.ieee.org/document/6830642/

10. S. Z. Gürbüz, M. B. Ozcan, A. B. Parım, S. Demirhan, Z. Hayran, M. C. Karaduman, **M. S. Seyfioğlu**, B. Tekeli, B. Çağlıyan "Target detection and ranging with the 2.4 GHz MIT Coffee Can radar," *2014 22nd Signal Processing and Communications Applications Conference (SIU)*, Trabzon, 2014, pp. 1450-1453. Link: http://ieeexplore.ieee.org/document/6830513/

11. Z. Hayran, A. B. Parım, **M. S. Seyfioğlu**, "A survey of pitch correction methods", 3rd ATMM (Audio Technologies for Music and Media) International Conference, pp. 67-78, 2014

Technical Reports

1. S. Z. Gürbüz, **M. S. Seyfioğlu**, "Identification of Biological Signals With Radar", *ENRAM (European Network for the Radar surveillance of Animal Movement), Short Term Scientific Mission Report,* October 2015, Sempach/Switzerland

ACHIEVEMENTS & SCHOLARSHIPS

- Selected as Principal Candidate for **"Fulbright PhD Scholarship".** Scholarship includes a total of $100,000 in funding for 2 years of university tuition and monthly stipends. (2018-present).
- Awarded **"Full Scholarship"** for MSc. Education from TOBB University, covering monthly stipends and tuition fee waiver (2015-2016).
- Awarded scholarship from TÜBİTAK, covering monthly stipends (2015-2016).
- Awarded scholarship from Havelsan, covering monthly stipends (2014-2015).

LANGUAGES

Turkish	**:** Native
English (TOEFL IBT)	**:** Total **104**/120 (Exam Date: 4 Nov. 2017) Reading **29**/30, Listening **26**/30 Speaking **24**/30, Writing **25**/30
German (Goethe A2**)**	**: 79**/100 (2015)

SKILLS

Programming	**:** Python, MATLAB, Java, C/C++, Git, Docker, Bash, SQL
Machine Learning Libraries	**:** Tensorflow, Keras, Theano, Scikit-Learn
Operating Systems	**:** Linux (Debian based distros), Windows
Vector Graphics Editor	**:** Adobe Illustrator, Inkscape
Type Setting	**:** Latex, Microsoft Office