ILKAY YILDIZ

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EDUCATION

NORTHEASTERN UNIVERSITY, BOSTON, MA
PHD CANDIDATE IN ELECTRICAL AND COMPUTER ENGINEERING ***MAY 2021***

- CGPA: 3.89/4.0. Dean's Fellow and Research Assistant: Full-tuition coverage with monthly stipend.
- Selected Courses: Parallel Processing and Data Analytics, Applied Probability and Stochastic Processes, Mathematical Statistics, Advanced Machine Learning, Probabilistic System Modeling, Advanced Computer Vision, Big Data and Sparsity in Optimization, Numerical Optimization Methods, Data Mining Techniques

I.D. BILKENT UNIVERSITY, ANKARA, TURKEY
BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING ***JUNE 2017***
FULBRIGHT FELLOWSHIP RECIPIENT FOR PHD EDUCATION IN USA ***JULY 2016***

- CGPA: 3.95/4.0. Class ranking: 8th/277. Comprehensive Scholarship: Full-tuition coverage with monthly stipend.
- Selected Courses: Statistical Learning & Data Analytics, Probability and Statistics, Algorithms and Programming
- August - December 2015: Case Western Reserve University, Cleveland, OH, as an exchange student
- Ranked as 315th out of two million students in university entrance exam

PROFESSIONAL EXPERIENCE

UNIVERSITY OF SOUTHERN CALIFORNIA, LABORATORY OF NEUROIMAGINING
POSTDOCTORAL RESEARCH ASSOCIATE ***JUNE 2021-PRESENT***
FACULTY MENTOR: DR. DOMINIQUE DUNCAN
EPILEPSY BIOINFORMATICS STUDY FOR ANTIEPILEPTOGENIC THERAPY (EPIBIOS4RX) AFTER TRAUMATIC BRAIN INJURY

- Extended existing late seizure detection methods applied on structural MRI images to deep learning approaches

COGNITIVE SYSTEMS LABORATORY, NORTHEASTERN UNIVERSITY
GRADUATE RESEARCH ASSISTANT ***SEPTEMBER 2017 – MAY 2021***
ADVISORS: DR. STRATIS IOANNIDIS, DR. DENIZ ERDOGMUS, DR. JENNIFER DY
IN COLLABORATION WITH OREGON HEALTH & SCIENCE UNIVERSITY, PORTLAND, OR, USA
ASSIST/IROP PROJECT FOR AUTOMATED DIAGNOSIS OF RETINOPATHY OF PREMATURITY (ROP) DISEASE
THESIS TITLE: SPECTRAL RANKING REGRESSION

- Based on a retinal image dataset labeled by ophthalmologists w.r.t. existence and relative severity of ROP.
- Designed a neural network architecture that is trained on class and comparison labels and that improves predictions up to 35% accuracy. This network with 6M parameters is successfully trained on only 80 samples.
- Designed spectral ranking regression algorithms that converge up to 579 times faster than Newton's method and perform up to 13% more accurately than state-of-the-art spectral algorithms for rank aggregation. Extension to regression with deep models maintains speed and prediction performance gains, by up to 175 times faster convergence and 26% higher prediction accuracy compared to ranking with siamese networks.
- Received Facebook Statistics Fellowship awarded to only 6% of the submissions in August 2020.

MITSUBISHI ELECTRIC RESEARCH LABS, BOSTON, MA
COMPUTER VISION RESEARCH INTERN ***MAY - NOVEMBER 2020***

- Deep Kalman filter-based facial landmark tracking that is robust against occlusions and bounding box variations

WAYFAIR, BOSTON, MA: ONLINE SHOPPING AND RECOMMENDATION INTERFACE FOR HOME DECORATION
DATA SCIENCE INTERN ***MAY - SEPTEMBER 2019***

- Trained a neural network on room style comparisons to predict style in room images. Improved the recall rate of the previous model by 50%. Resulting model runs the Frequently Bought Together carousel on the website.

FRAUNHOFER INSTITUTE FOR INTEGRATED CIRCUITS, ERLANGEN, GERMANY
INTERN ***JUNE - SEPTEMBER 2016***

Designed a residual stereo acoustic echo suppression filter, which copes with the non-uniqueness and instability problems. Implemented in MATLAB. Currently used off-the-shelf by the company for future research.

TECHNICAL SKILLS

- **Advanced:** Python (Keras, PyTorch, OpenCV, Cvxpy, Scikit-learn, Numpy, Scipy, NiBabel), PyCharm, Cluster Computing (Slurm), Object-Oriented Programming, LATEX, Bash, Linux, Git
- **Intermediate:** PySpark, MATLAB, C/C++, Java, Eclipse, MSSQL

AREAS OF INTEREST

Ranking and Preference Learning, Deep Learning, Optimization, Probabilistic Modeling, Computer Vision

TEACHING EXPERIENCE

NORTHEASTERN UNIVERSITY, BOSTON, MA

T.A. FOR INTRO AND ADVANCED MACHINE LEARNING ***JANUARY – MAY 2018, SEPTEMBER – DECEMBER 2019***

- Mentored 100 students. Graded homeworks, exams, and projects. Instructed recitations.

PUBLICATIONS

- I. Yildiz, J. Dy, D. Erdogmus, S. Ostmo, J. P. Campbell, M. F. Chiang, S. Ioannidis, "Deep Spectral Ranking", AISTATS, Virtual Conference, 2021
- V. M. Yildiz, S. Ioannidis, I. Yildiz, P. Tian, J. P. Campbell, S. Ostmo, J. Kalpathy-Cramer, M. F. Chiang, D.Erdogmus, J. Dy, "Structural Visual Guidance Attention Networks in Retinopathy of Prematurity", ISBI, Virtual Conference, 2021
- A. Hanif, I. Yildiz, P. Tian, B. Kalkanli, D. Erdogmus, S. Ioannidis, J. Dy, J. Kalpathy-Cramer, S. Ostmo, K. Jonas, R. P. Chan, M. F. Chiang, J. P. Campbell, "Improved training efficiency for deep learning models using disease severity comparison labels", ARVO Abstract, 2021
- I. Yildiz, J. Dy, D. Erdogmus, J. Kalpathy-Cramer, S. Ostmo, J. P. Campbell, M. F. Chiang, S. Ioannidis, "Fast and Accurate Ranking Regression", AISTATS, Virtual Conference, 2020
- T. Weiss, I. Yildiz, N. Agarwal, E. Ataer-Cansizoglu, J.-W., Choi, "Image-Driven Furniture Style for Interactive 3D Scene Modeling", Pacific Graphics, 2020
- I. Yildiz, E. Cansizoglu, H. Liu, P.B. Golbus, O. Tezcan, J.W. Choi, "Deep Ranking for Style-Aware Room Recommendations", AAAI, Student Abstract, 2020
- M. Han, S. Y. Günay, I. Yildiz, P. Bonato, C. D. Onal, T. Padir, G. Schirner, D. Erdogmus, "From hand-perspective visual information to grasp type probabilities: deep learning via ranking labels", PETRA, 2020
- I. Yildiz, P. Tian, J. Dy, D. Erdogmus, J. Brown, J. Kalpathy-Cramer, S. Ostmo, J. P. Campbell, M. F. Chiang, S. Ioannidis, "Classification and Comparison via Neural Networks", Elsevier J. of Neural Networks, Vol. 118, 10/2019, pp. 65-80
- V. M. Yildiz, P. Tian, I. Yildiz, J. M. Brown, J. Kalpathy-Cramer, J. Dy, S. Ioannidis, D. Erdogmus, S. Ostmo, S. J. Kim, R. P. Chan, "Plus Disease in Retinopathy of Prematurity: Convolutional Neural Network Performance Using a Combined Neural Network and Feature Extraction Approach", Translational Vision Science & Technology, 9(2), 10-10.
- B. Kadioglu, I. Yildiz, P. Closas, M.B. Fried-Oken, D. Erdogmus, "Robust Fusion of c-VEP and Gaze", Journal of Selected Topics in Signal Processing, 2018
- B. Kadioglu, I. Yildiz, P. Closas, D. Erdogmus, "M-estimation based Subspace Learning for Brain Computer Interfaces", Journal of Selected Topics in Signal Processing, 2018
- M.L. Valero, I. Yildiz, E. Mabande, E.A.P. Habets, "Coherence-aware stereophonic residual echo estimation", HSCMA, 2017
- H. C. Baykara, E. Biyik, G. Gul, D. Onural, A. S. Ozturk, I. Yildiz, "Real-Time Detection, Tracking and Classification of Multiple Moving Objects in UAV Videos", ICTAI, 2017

PEER REVIEW EXPERIENCE

- 2021 IJCAI, 2021 CVPR, 2021 SDM, 2019 IEEE MLSP, 2018 NeurIPS WiML Workshop

TUTORIALS & INVITED TALKS

- *Learning From Comparisons*, Tutorial, World Wide Web, Virtual Conference, April 2021

RELATED PROJECTS

NORTHEASTERN UNIVERSITY, BOSTON, MA

SENTIMENT CLASSIFICATION ON BILINGUAL TWEETS ***SEPTEMBER - DECEMBER 2020***

- Trained a two-stream bidirectional transformer (BERT) architecture for sentiment analysis in PyTorch.

DEEP PROBABILISTIC BACKGROUND MODEL ESTIMATION FROM VIDEOS ***SEPTEMBER - DECEMBER 2019***

- Trained a variational autoencoder for background subtraction in videos via a loss function that sparsify the foreground and the rank of latent variables capturing background over time. Implemented using PyTorch.

ADAPTIVE GAN TRAINING VIA MULTI-ARMED BANDITS IN PYTORCH ***SEPTEMBER - DECEMBER 2018***

PYSPARK PROJECTS ***SEPTEMBER - DECEMBER 2017***

- Identified document similarities based on term frequency and inverse document frequency.
- Trained regularized linear and logistic regression models using stochastic gradient descent.
- Implemented matrix factorization to estimate user ratings.

I.D. BILKENT UNIVERSITY, ANKARA, TURKEY

DETECTION AND CLASSIFICATION OF MOVING OBJECTS FROM UAV VIDEOS ***SEPTEMBER 2016 – MAY 2017***

- Major contribution in a C++ based real-time framework to detect, track, and classify objects from UAV videos.

MUSIC GENRE CLASSIFICATION IN MATLAB ***SEPTEMBER – DECEMBER 2016***

ACTIVITIES & MEMBERSHIPS

- Active member of the committee of alumni mentors at Bilkent University
  - Supervising undergraduate engineering students seeking graduate education and job opportunities abroad
- 5/8th grade practical performance certificate for violin. Granted by Associate Board of the Royal School of Music, London, UK