Didem 'Dianne' Gökçay, PhD.

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SYNOPSIS

Senior Data Scientist specializing in multiple interdisciplinary areas:
HCI, Wearable devices, Biomedical and Health Informatics, Cognitive and Affective Neuroscience

20+ years of experience in both theoretical and technical aspects of AI and ML.

Expertise in psychological and behavioral experiment design, behavioral and neurophysiological data collection, data pre-processing, and data analysis using statistical, ML and neural network tools.

Domain knowledge on neuropsychological applications involving digital health and affective computing/interaction conducted on healthy and clinical populations.

Research and development project management in state of the art areas such as stress detection, sentiment analysis, e-mental health, multi-modal physiological data fusion (eg. pupil dilation, GSR, temperature, HR), human brain mapping with MRI, fMRI, fNIRS

SKILLS

Technical Skills: SQL, Excel Solver, C++, Python (tensorflow, sklearn, pandas, numpy, matplotlib, seaborn)

Research Skills:

AI: ANN, CNN, Deep learning, Pooling, Pruning, Batch Normalization

ML: Supervised learning, Bagging, Randomforest, AdaBoost, GradientBoost, GridSearchCV, Clustering, ROC

Neuroimaging: Image analysis, Computer Vision, AFNI, FSL

Experimental Skills: Cognitive experiment design, Multi-modal Data Collection, Database Design, Hypothesis testing, Statistical Analysis, Regression

Qualitative Skills: MAXQDA qualitative analysis, Story telling from data, CBT, E-mental health content, Ethical board application

Academic skills: Higher education teaching, Academic editing, Academic publishing, Curriculum design

Supervisory Skills: Mentorship, Analytical decision making, Communication, Delegation, Teamwork, Creative problem solving

Organizational Skills: Lab/Grant Management, International/National conference organization, Fundraising

EDUCATION

PG in AI/ML	(2022)	**Mc Combs Business School, University of Texas, Austin**
PhD	(2001)	**Department of Computer, Information Science & Engineering, University of Florida** Dissertation on ANN: Self-organizing Features for Regularized Image Standardization
MS	(1991)	**Department of Electrical and Electronic Engineering, Middle East Technical University** Thesis on ANN: User Identification Through Neural Network Algorithms
BS	(1988)	**Department of Electrical and Electronic Engineering, Middle East Technical University**

RESEARCH

Developed emerging technologies based on new data collection and analysis paradigms; targeting better, faster and computationally feasible outcomes for engineering projects involving healthy and clinical populations.

Experience

Contractor (funded by Tubitak): Integrated software for collection, pre-processing, analysis and classification of facial pscyhophysiological data. Improved automatic classification performance by 20% using fusion techniques on multi-modal data such as EMG, pupil diameter, GSR, skin temperature.

Director MetuNeuro Lab (https://ii.metu.edu.tr/metu-neuro-0): Developed in-house software predominantly written in MATLAB and C# for cognitive task design and for advanced MR/fMRI/fNIRs analyses. Published these cutting-edge techniques in several pioneering journals and conferences.

Contractor (NIH): Produced a turn-key semi-automatic facial expression analysis software to document the slow motion and diminished gestures of patients with Parkinson's Disease. Compared to its counterparts, the software is elegant, user-friendly and has low-computational cost.

Projects

- Development of hardware and software infrastructure for physiological human data from tha facial area (Tubitak, #117E650, 2018-2022)
- MasterMIND Management of mental health diSorders through telehealth for the MIND (FP7, #621000, 2014-2017) (https://mastermind-project.eu)
- A database study for generation of Turkish word and picture sets that are normed across emotional and semantic axes (Tubitak, #113E624, 2014-2016)
- Localization of emotional conflict resolution in healthy and Major Depression populations (Tubitak, #109E081, 2009-2012)

Publications

AI/ML and HCI

- Hand Pronation–Supination Movement as a Proxy for Remotely Monitoring Gait and Posture Stability in Parkinson's Disease, Sensors, 2022, *22*(5), 1827
- Evaluation of Data Compression Methods for Efficient Transport and Classification of Facial EMG Signals, In: Operations Research, Purutcuoglu, Weber, Farnoudkia (Eds.), 2022, CRC Taylor & Francis
- Preliminary results in evaluating the pleasantness of an interviewing candidate based on psychophysiological signals, Proceedings of Enterface 2019, Ankara
- Binary Classification Using Neural and Clinical Features: An Application in Fibromyalgia with Likelihood based Decision Level Fusion, *IEEE Journal of Biomedical and Health Informatics*, 2019, 23(4): 1490–1498
- Stress Detection in Human Computer Interaction: Fusion of Pupil Dilation and Facial Temperature Features, *Int. Journal of Human-Computer Interaction*, 2016, 32 (12), 956-966

Digital Health Science and Affective/Cognitive Neuroscience

- Diffusion Tensor Imaging Group Analysis Using Tract Profiling and Directional Statistics, *Front Neurosci*, 2021, 15:625473
- Affective Computing and Interaction: Psychological, Cognitive and Neuroscientific Perspectives, Editors: D. Gökçay, G. Yıldırım, Publisher: IGI Global, 2011

TEACHING

Strived for delivering superb course and program content, enhanced with state of the art applications. Mentored students from a wide array of departments including eletrical, computer and biomedical engineering, psychology, biology and medical college.

Courses:

Quantitative Analysis for Business: Milgard Business School, University of Washington, Tacoma
Digital Health: Database applications in Health Informatics, Reasoning under Uncertainty, Introduction to Medical Informatics, taught under Medical Informatics Graduate Program, METU
Cognitive Neuroscience: Affective Neuroscience and Computing, Principles of Cognitive Neuroscience, Neuroimaging, Advanced Neuroimaging, Systems Neuroscience, Biological Psychology, Functional Neuroanatomy, taught under the neuroscience track of Health Informatics, METU

Curriculum development: Design of a new neuroscience track under the department of Health Informatics.

Mentorship:

Undergraduate: Hosting of 15+ undergraduate students at the MetuNeuro Lab for summer internship
Graduate: Supervision of 30+ MS/PhD theses under the biomedical engineering, cognitive science, information systems and medical informatics programs of METU
Postdoctoral: Mentoring of an international postdoctoral fellow supported by TUBITAK Turkish NSF for implementation of online and mobile interventions for moderate depression.

VOCATIONAL SERVICE

Improved the existing academic agendas by advocating interdisciplinary topics and forging new educational protocols with leading universities and research centers (e.g. Max Planck, Başkent and Dokuz Eylül Univ.)

Conferences: Organization of 3 international and 10 national conferences to disseminate knowledge

Invited Talks: Delivery of 25+ invited talks throughout Turkey, Europe and USA to increase awareness in emerging technologies

Administration: Membership on interdisciplinary academic boards including the departments of Health Informatics, Biomedical Engineering, Cognitive Science, Brain Research Center at Ankara University

Evaluation: Referee duties on the international panels organized by the European Commission for Future and Emerging Technologies under the FP7 and Horizon 2020 Funding Schemes

EMPLOYMENT HISTORY

Academic Editor	(2021 - 2022)	**Research Square, Durham**
Instructor	(2020 - 2021)	**University of Washington, Tacoma,** Milgard Business School
Associate Professor	(2018 - 2020)	**METU, Turkey:** Tenure in Biological & Cognitive Experimental Psychology
Research Scientist	(2015 - 2016)	**Emory University, GA:** Department of Radiological & Imaging Sciences
Assistant Professor	(2005 - 2018)	**METU, Turkey:** Department of Medical Informatics
Postdoctoral Fellow	(2001 - 2004)	**UCSD, CA**: Laboratory for Research on the Neuroscience of Autism
Research Assistant	(1994 - 2001)	**University of Florida, FL:** Mc Knight Brain Institute, Cognitive Neuropsychology Laboratory & Department of Computer Science
Engineer, DB Admin	(1988 - 1993)	**Turkish NSF TUBITAK**, **Martin Marietta Gama Electronics, Turkey:** R&D Divisions

AWARDS

Fulbright Scholarships:

Faculty Research Scholarship (2015-2016): Emory University, Atlanta

PhD scholarship (1993-1997): University of Florida, Gainesville

Academic Performance Awards:

Turkish Board of Regents for Higher Education (YÖK) (2017, 2018): Ankara

METU Office of the President (2016, 2014, 2012, 2010, 2008): Issued biannually, Ankara

Supervision Awards:

METU Best PhD Thesis Supervision Award (2017): Aykut Eken, 'Investigating Pain Perception in Somatosensory Cortex for Healthy and Fibromyalgia Patient Populations by using fNIRS'

METU Best MS Thesis Supervision Award (2010): K. Dogus Turkay, 'Simulated fMRI Toolbox'

METU Best MS Thesis Supervision Award (2008): Zeynep Basgoze, 'Emotional Conflict Resolution in MDD'

Research Awards:

Astra Zeneca research project award (2006): Brain Research Association, Istanbul

Turkish Pharmachology Congress Poster award (2007): Turkish Pharahological Association, Istanbul

Higher Education Awards:

METU Best MS Thesis Award (1991): 'User IdentificationThrough Neural Network Algorithms'

Undergraduate Scholarship (1983 - 1987): Sabancı Foundation, Adana

MEMBERSHIPS and VOLUNTEERING

Member (1991 - present): Turkish Board of Electrical Engineers

Reviewer (2016 - present): Frontiers in Neuroscience, Neuroprosthetics Section

EXTRACURRICULAR ACTIVITIES

Creative writing (2017, ongoing): Certificates in literary courses on fiction, dramatic writing, philosophy in literature and editing from UMAG Journalism Foundation, Ankara