Kleanthis Avramidis

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RESEARCH INTERESTS

Physiological and Biomedical Signal Processing, Music Information Retrieval
Multimodal Representation Learning, Self-supervised Learning, Affective Computing

EDUCATION

PhD in Computer Science *08/2021 - Present*
University of Southern California (USC), Los Angeles, CA
Advisor: Prof. Shrikanth Narayanan
Current GPA: 3.85/4

Joint BSc & MEng in Electrical Engineering *10/2015 - 07/2021*
National Technical University of Athens (NTUA), Greece
Advisor: Prof. Petros Maragos
GPA: 8.40/10 (top 12%), Specialization GPA: 9.14/10

RESEARCH PROJECTS

Sensor Fusion for Affective State Detection in Driving *05/2022 - Present*
USC – Toyota Research – MIRISE Technologies

- Developing methods for sensor fusion & self-supervision on physiological signals
- Coordinating multiple data collection processes in the driving setting
- Applied methods for Time-Series Segmentation and Clustering to detect change points in drivers' affective state; authored 1 article

Automatic Differentiation of Pediatric Papilledema *02/2022 - Present*
USC – Children's Hospital Los Angeles – External Sites

- Building deep learning models to differentiate Papilledema from pseudo-cases in challenging pediatric cases, with data collected from multiple sites
- Contributed 1 publication and 2 abstracts within an interdisciplinary team

CVI Evaluation through Eye-tracking Technology *02/2022 - Present*
USC – Children's Hospital Los Angeles

- Designing maps of visual saliency on stimulus images to assess differences of Cortical Visual Impairment (CVI) cases against controls

Wearable Bio-sensing for Family Well-being *10/2021 - Present*
TU Austin – Texas A&M – USC

- Configured scripts to clean and process raw data from multiple wearable sensors
- Leading the development of statistical and learning methods to identify predictive elements of family reported well-being and conflict
- Contributing and cooperating with collaborators from the Psychology field

Diploma Thesis, NTUA *05/2020 - 07/2021*
Title: Affective Analysis and Interpretation of Brain Responses to Music Stimuli

- Applied elements of Multiscale Fractal Analysis to extract affective characteristics from musically-induced EEG signals. Authored 1 publication.
- Developed multimodal models to connect music audio and EEG features using adversarial and contrastive learning objectives. Authored 1 publication.

WORK EXPERIENCE

Signal Analysis and Interpretation Lab *08/2021 - Present*
University of Southern California, Los Angeles, CA
Graduate Research Assistant, under Prof. Shrikanth Narayanan

- Building a multi-step training framework for audiovisual learning of music representations from official video clips, authored 1 abstract and poster
- Coordinator of project-wise lab and colab meetings, research mentor of a master's student and a sophomore student in Electrical Engineering

Computer Vision, Speech & Signal Processing Lab *07/2019 - 07/2021*
National Technical University of Athens, Greece
Undergraduate Research Assistant, under Prof. Petros Maragos

- Conducted Research in Musical Instrument Recognition
  Co-authored 2 publications, completed my MEng Diploma Thesis
- Peer-reviewing: ICASSP, EUSIPCO Conferences, ACM TOMM

SKILLS

Core Programming Languages: Python, C++, MATLAB, LaTeX
Tools and Libraries: Unix, Git, Jupyter, PyTorch, Pandas, Scipy, Librosa, PyDub, ts-learn, scikit-learn, scikit-image, OpenCV, Transformers

HONORS AWARDS

☆ **Future Vision Forum Award** *10/2022*
Acceptance and grant to participate with a poster presentation at invitation-only Symposium of Human-Centric Computing in Ophthalmology

☆ **Oxford Summer School in Machine Learning 2022** *08/2022*
Accepted to participate at the Machine Learning for Healthcare track

☆ **Second Prize @ NEUROHACK 2022** *01/2022*
Award for a Machine Learning model that identifies and utilizes important biomarkers in predicting Dementia

☆ **Computer Science PhD Fellowship** *08/2021*
University of Southern California

☆ **A Great Moment for Education** *01/2016*
Award and Grant from Eurobank EFG for the highest University Entrance Examination Score of my High School

PUBLICATIONS

1. **K. Avramidis**, T. Feng, D. Bose, and S. Narayanan
   "Multimodal Estimation of Change Points of Physiological Arousal in Drivers"
   Under review for ICASSP 2023
2. **K. Avramidis**, S. Stewart, and S. Narayanan
   "On the Role of Video Context in Enriching Music Representations"
   Conference of the International Society for Research on Emotion (ISRE), 2022.
   Under review for ICASSP 2023
3. **K. Avramidis**, M. Rostami, M. Chang, and S. Narayanan
   "Automating Detection of Papilledema in Pediatric Fundus Images with Explainable Machine Learning"
   Proc. Int'l Conf. on Image Processing (ICIP), 2022.
4. **K. Avramidis**, C. Garoufis, A. Zlatintsi, and P. Maragos
   "Enhancing Affective Representations of Music-Induced EEG through Multimodal Supervision and Latent Domain Adaptation"
   Proc. Int'l Conf. on Acoustics, Speech and Signal Processing (ICASSP), 2022.
5. **K. Avramidis**, A. Zlatintsi, C. Garoufis, and P. Maragos
   "Multiscale Fractal Analysis on EEG Signals for Music-Induced Emotion Recognition"
   Proc. European Signal Processing Conference (EUSIPCO), 2021.
6. **K. Avramidis**, A. Kratimenos, C. Garoufis, A. Zlatintsi, and P. Maragos
   "Deep Convolutional and Recurrent Networks for Polyphonic Instrument Classification from Monophonic Raw Audio Waveforms"
   Proc. Int'l Conf. on Acoustics, Speech and Signal Processing (ICASSP), 2021.
7. A. Kratimenos, **K. Avramidis**, C. Garoufis, A. Zlatintsi, and P. Maragos
   "Augmentation Methods on Monophonic Audio for Instrument Classification in Polyphonic Music"
   Proc. European Signal Processing Conference (EUSIPCO), 2020.