

Kleanthis Avramidis

3710 McClintock Ave., RTH 318
Los Angeles, CA 90089, United States

✉ avramidi@usc.edu
🌐 klean2050.github.io

RESEARCH INTERESTS	Physiological and Biomedical Signal Processing, Music Information Retrieval Multimodal Representation Learning, Multimodal Interactions, Health and Wellness	
EDUCATION	PhD in Computer Science University of Southern California (USC), Los Angeles, CA Advisor: Prof. Shrikanth Narayanan Current GPA: 3.83/4	<i>08/2021 - Present</i>
	Joint BSc & MEng in Electrical Engineering National Technical University of Athens (NTUA), Greece Advisor: Prof. Petros Maragos GPA: 8.40/10 (top 12%), Specialization GPA: 9.14/10	<i>10/2015 - 07/2021</i>
RESEARCH PROJECTS	Entrainment in Expert and Novice Musicians USC Center for Music, Brain, and Society	<i>07/2025 - Present</i>
	• Methods to quantify and compare neurophysiological entrainment to music • Identification of differences in attentional strategies and emotional responses • Predominant musical elements in driving entrainment intensity	
	Speech Paralinguistics from Facial Muscle Activity USC – Technical University of Munich (TUM)	<i>09/2024 - Present</i>
	• Developing machine learning models for translating between EMG activations and audio speech waveforms with application to silent speech interfaces • Analysis of the temporal dynamics of muscle activation in speech production • Affective elements of speech in vocal versus silent articulation	
	PRECOG: Multimodal Integration of Neural and Biobehavioral Signals for Predicting Preconscious Responses USC – UCLA	<i>05/2023 - 08/2025</i>
	• Developing representation learning models for brain activity signals (EEG) • Analysis of human physiology (ECG, GSR, eye-tracking) in controlled settings • Inference on detecting biomarkers of depression and suicidal ideation • Applied trial-based bootstrapping to regularize deep learning modeling of short experimental trials, applied on eye tracking; authored 1 article	
	Sensor Fusion for Affective State Detection in Driving USC – Toyota Research Institute NA – MIRISE	<i>05/2022 - 06/2025</i>
	• 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	
	NSF SCH: Wearable Sensing of Workplace Stress USC Occupational Therapy – Engineering	<i>09/2023 - Present</i>
	• Coordinating longitudinal data collection using biobehavioral sensors • Application of AI methods to determine personalized stress patterns	
	CVI Evaluation through Eye-tracking Technology USC – Children's Hospital Los Angeles	<i>02/2022 - 06/2024</i>
	• Designing maps of visual saliency on stimulus images to assess differences of Cortical Visual Impairment (CVI) cases against controls	

WORK
EXPERIENCE

Automatic Differentiation of Pediatric Papilledema 02/2022 - 08/2023
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

Wearable Bio-sensing for Family Well-being 10/2021 - 08/2023
UT 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
- Expanding methodologies to relevant projects on assessing workplace stress

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.

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

Chair of Health Informatics 05/2025 - 06/2025
Technical University of Munich, Germany
Visiting Doctoral Researcher, under Prof. Björn Schuller

- Contributed to a study on Silent Paralinguistics, including data collection design and analysis of surface electromyography (EMG) during speech production

Meta Reality Labs 05/2024 - 08/2024
Meta Platforms Inc., New York City, NY
Research Scientist Intern, under Nariman Farsad, PhD

- Developed AI methods for advancing augmented reality experiences
- Created machine learning models for decoding neuromotor signals

Toyota Research Institute of North America 05/2023 - 08/2023
Toyota Motor North America, Ann Arbor, MI
Research and Development Co-op, under Paul Schmalenberg, MSc

- Developed methods for sensor fusion & anomaly detection on biosignals
- Created machine learning models for contact-less heart rate estimation
- Coordinated machine learning software for physics-informed AI applications

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

SKILLS

Tools and Libraries: Python, L^AT_EX, Git, Jupyter, PyTorch, Pandas, Scipy, Librosa, PyDub, scikit-learn, scikit-image, OpenCV, Transformers, Neurokit2, MNE-Python

Service: IEEE (Graduate Student Membership, Reviewer: ICASSP, ISBI, IJCNN, WASPAA, J-BHI), ACM (Student Membership, Reviewer: TOMM), ISRE 2022: Student Volunteer, Nature (Reviewer: Biomedical Engineering, Scientific Reports)

Languages: Greek (native), English (proficient), German (intermediate)

HONORS AWARDS

- ☆

USC Center for Music, Brain, and Society Pilot Grant

to investigate neural entrainment to music in expert and novice musicians

06/2025
- ☆

USC EE Research Festival – Outstanding Poster Award

11/2024
- ☆

USC GSG Professional Development Fund

Travel award towards attending IEEE EMBC 2024

05/2024
- ☆

IEEE EMBC NextGen Scholar Award

Grant towards conference registration at IEEE EMBC 2024

04/2024
- ☆

Gerondelis Foundation Scholarship

06/2023
- ☆

Best Poster Award: Artificial Intelligence to Classify Fundus Photographs of Pediatric Pseudopapilledema and Papilledema, 48th AAPOS Annual Meeting

05/2023
- ☆

Future Vision Forum Award

Acceptance and grant to participate with a poster presentation at invitation-only Symposium of Human-Centric Computing in Ophthalmology

10/2022
- ☆

Oxford Summer School in Machine Learning 2022

Accepted to participate at the Machine Learning for Healthcare track

08/2022
- ☆

Second Prize @ NEUROHACK 2022

Award for a Machine Learning model predicting Dementia

01/2022
- ☆

Computer Science PhD Fellowship

University of Southern California

08/2021
- ☆

A Great Moment for Education

Award and Grant from Eurobank EFG for the highest University Entrance Examination Score of my High School

01/2016

TALKS EVENTS

1. Chair of Health Informatics, Technical University of Munich

Talk: “Biobehavioral Signal Processing for Mental Health Understanding”
June 2025, Munich, Germany
2. Mapping Brain-Body-Behavior Signal Dynamics in Human Speech Production and Interaction

Event: Satellite Workshop at ICASSP 2025 (Student Volunteer)
April 2025, Hyderabad, India
3. Society for Affective Science Annual Conference (SAS 2023)

Talk: “Psychophysiology Sensing via Wearables to model Family Well-being”
March 2023, Long Beach, CA
4. 2022 Future Vision Forum: Human-Centric Computing

Poster: “Deep Learning Modeling to differentiate Papilledema from Pseudopapilledema in Pediatric Cases”
November 2022, Los Angeles, CA
5. International Society for Research on Emotion (ISRE 2022)

Poster: “Context-aware Representations of Affect in Media from Music and Visual Streams: A Self-supervised Approach”
July 2022, Los Angeles, CA

SELECTED
PUBLICATIONS

1. **K. Avramidis**, E. Zhou, T. Feng, and others, and S. Narayanan
“Estimating markers of driving stress through multimodal physiological monitoring”.
submitted to IEEE Transactions of Biomedical Engineering, 2025
2. **K. Avramidis**, W. Jeong, A. Kommineni, and others, and S. Narayanan
“Deep learning characterizes Depression and Suicidal Ideation from Eye Movements”.
under review for npj Digital Medicine, 2025
3. A. Timmons, AA. Tutul, **K. Avramidis**, and others, and T. Chaspari
“Developing Personalized Algorithms for Sensing Mental Health Symptoms
in Daily Life”.
npj Mental Health Research, 2025
4. J. Lee, K. Huang, **K. Avramidis**, S. Pistrosch, M. Gonzalez-Machorro, Y. Lee,
B. Schuller, L. Goldstein, and S. Narayanan
“Articulatory Feature Prediction from Surface EMG during Speech Production”.
Proc. Interspeech, 2025
5. **K. Avramidis**, M. Chang, R. Sharma, M. Borchert, S. Narayanan
“Evaluating Atypical Gaze Patterns through Vision Models: The Case of Cortical
Visual Impairment”
Proc. IEEE Engineering in Medicine and Biology Conference (EMBC), 2024
6. A. Kommineni, **K. Avramidis**, R. Leahy, S. Narayanan
“Knowledge-guided EEG Representation Learning”
Proc. IEEE Engineering in Medicine and Biology Conference (EMBC), 2024
7. **K. Avramidis**, D. Kunc, B. Perz, K. Adsul, T. Feng, P. Kazienko, S. Saganowski,
and S. Narayanan
“Scaling Representation Learning from Ubiquitous ECG with State-Space Models”
IEEE Journal of Biomedical and Health Informatics, 2024
8. **K. Avramidis**, T. Feng, D. Bose, and S. Narayanan
“Multimodal Estimation of Change Points of Physiological Arousal in Drivers”
Proc. Int’l Conf. on Acoustics, Speech and Signal Processing Workshops, 2023
9. **K. Avramidis**, S. Stewart, and S. Narayanan
“On the Role of Video Context in Enriching Music Representations”
Proc. Int’l Conf. on Acoustics, Speech and Signal Processing (ICASSP), 2023
10. **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.
11. **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.
12. **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.
13. **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.
14. 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.