

# 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	<div><div><b>PhD in Computer Science</b><i>08/2021 - Present</i> University of Southern California (USC), Los Angeles, CA Advisor: Prof. Shrikanth Narayanan Current GPA: 3.90/4</div><div><b>Joint BSc &amp; MEng in Electrical Engineering</b><i>10/2015 - 07/2021</i> National Technical University of Athens (NTUA), Greece Advisor: Prof. Petros Maragos GPA: 8.40/10 (top 12%), Specialization GPA: 9.14/10</div></div>
RESEARCH PROJECTS	<div><div><b>Sensor Fusion for Affective State Detection in Driving</b><i>05/2022 - Present</i> USC – Toyota Research Institute NA – MIRISE<ul style="list-style-type: none"><li>• Developing methods for sensor fusion &amp; self-supervision on physiological signals</li><li>• Coordinating multiple data collection processes in the driving setting</li><li>• Applied methods for Time-Series Segmentation and Clustering to detect change points in drivers' affective state; authored 1 article</li></ul></div><div><b>Automatic Differentiation of Pediatric Papilledema</b><i>02/2022 - Present</i> USC – Children's Hospital Los Angeles – External Sites<ul style="list-style-type: none"><li>• Building deep learning models to differentiate Papilledema from pseudo-cases in challenging pediatric cases, with data collected from multiple sites</li><li>• Contributed 1 publication and 2 abstracts within an interdisciplinary team</li></ul></div><div><b>CVI Evaluation through Eye-tracking Technology</b><i>02/2022 - Present</i> USC – Children's Hospital Los Angeles<ul style="list-style-type: none"><li>• Designing maps of visual saliency on stimulus images to assess differences of Cortical Visual Impairment (CVI) cases against controls</li></ul></div><div><b>Wearable Bio-sensing for Family Well-being</b><i>10/2021 - 08/2023</i> UT Austin – Texas A&amp;M – USC<ul style="list-style-type: none"><li>• Configured scripts to clean and process raw data from multiple wearable sensors</li><li>• Leading the development of statistical and learning methods to identify predictive elements of family reported well-being and conflict</li><li>• Contributing and cooperating with collaborators from the Psychology field</li></ul></div><div><b>Diploma Thesis, NTUA</b><i>05/2020 - 07/2021</i> Title: Affective Analysis and Interpretation of Brain Responses to Music Stimuli<ul style="list-style-type: none"><li>• Applied elements of Multiscale Fractal Analysis to extract affective characteristics from musically-induced EEG signals. Authored 1 publication.</li><li>• Developed multimodal models to connect music audio and EEG features using adversarial and contrastive learning objectives. Authored 1 publication.</li></ul></div></div>
WORK EXPERIENCE	<div><div><b>Signal Analysis and Interpretation Lab</b><i>08/2021 - Present</i> University of Southern California, Los Angeles, CA <i>Graduate Research Assistant</i>, under Prof. Shrikanth Narayanan<ul style="list-style-type: none"><li>• Building a multi-step training framework for audiovisual learning of music representations from official video clips, authored 1 abstract and poster</li><li>• Coordinator of project-wise lab and colab meetings, research mentor of a master's student and a sophomore student in Electrical Engineering</li></ul></div></div>

	<b>Toyota Research Institute North America</b> <span style="float: right;">05/2023 - 08/2023</span> Toyota Motor North America, Ann Arbor, MI <i>Research and Development Co-op</i> , under Paul Schmalenberg, MSc <ul style="list-style-type: none"> <li>• Developed methods for sensor fusion &amp; anomaly detection on biosignals</li> <li>• Created machine learning models for contact-less heart rate estimation</li> <li>• Coordinated machine learning software for physics-informed AI applications</li> </ul>
	<b>Computer Vision, Speech &amp; Signal Processing Lab</b> <span style="float: right;">07/2019 - 07/2021</span> National Technical University of Athens, Greece <i>Undergraduate Research Assistant</i> , under Prof. Petros Maragos <ul style="list-style-type: none"> <li>• Conducted Research in Musical Instrument Recognition</li> </ul> Co-authored 2 publications, completed my MEng Diploma Thesis
SKILLS	<b>Programming Languages:</b> Python, C++, MATLAB, $\text{\LaTeX}$ <b>Tools and Libraries:</b> Unix, Git, Jupyter, PyTorch, Pandas, Scipy, Librosa, PyDub, ts-learn, scikit-learn, scikit-image, OpenCV, Transformers <b>Service:</b> IEEE (Graduate Student Membership, Reviewer: ICASSP), ACM (Student Membership, Reviewer: TOMM), ISRE 2022: Volunteer <b>Languages:</b> Greek (native), English, German
HONORS AWARDS	<div> <div>☆ <b>Future Vision Forum Award</b></div> <div>10/2022</div> </div> Acceptance and grant to participate with a poster presentation at invitation-only Symposium of Human-Centric Computing in Ophthalmology <div> <div>☆ <b>Oxford Summer School in Machine Learning 2022</b></div> <div>08/2022</div> </div> Accepted to participate at the Machine Learning for Healthcare track <div> <div>☆ <b>Second Prize @ NEUROHACK 2022</b></div> <div>01/2022</div> </div> Award for a Machine Learning model that identifies and utilizes important biomarkers in predicting Dementia <div> <div>☆ <b>Computer Science PhD Fellowship</b></div> <div>08/2021</div> </div> University of Southern California <div> <div>☆ <b>A Great Moment for Education</b></div> <div>01/2016</div> </div> Award and Grant from Eurobank EFG for the highest University Entrance Examination Score of my High School
TALKS EVENTS	<ol style="list-style-type: none"> <li><b>Society for Affective Science Annual Conference (SAS 2023)</b>          Talk: “Psychophysiology Sensing via Wearables to model Family Well-being”  <i>March 2023, Long Beach, CA</i></li> <li><b>2022 Future Vision Forum: Human-Centric Computing</b>          Poster: “Deep Learning Modeling to differentiate Papilledema from Pseudopapilledema in Pediatric Cases”  <i>November 2022, Los Angeles, CA</i></li> <li><b>International Society for Research on Emotion (ISRE 2022)</b>          Poster: “Context-aware Representations of Affect in Media from Music and Visual Streams: A Self-supervised Approach”  <i>July 2022, Los Angeles, CA</i></li> </ol>
PUBLICATIONS	<ol style="list-style-type: none"> <li><b>K. Avramidis</b>, T. Feng, D. Bose, and S. Narayanan          “Multimodal Estimation of Change Points of Physiological Arousal in Drivers”  <i>Proc. Int’l Conf. on Acoustics, Speech and Signal Processing Workshops</i>, 2023</li> <li><b>K. Avramidis</b>, K. Adsul, D. Bose, and S. Narayanan          “Signal Processing Grand Challenge 2023–E-Prevention: Sleep Behavior as an Indicator of Relapses in Psychotic Patients”  <i>Proc. Int’l Conf. on Acoustics, Speech and Signal Processing (ICASSP)</i>, 2023</li> </ol>

3. **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
4. **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.
5. **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.
6. **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.
7. **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.
8. 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.