

# George P. Kafentzis

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CONTACT INFORMATION	<a href="#">Department of Computer Science</a> <a href="#">University of Crete</a> H303, 2nd floor 70013 Voutes University Campus Heraklion, Crete, Greece	<i>Mobile:</i> +30-6945214480 <i>Line:</i> +30-2810-393533 <i>E-mail:</i> <a href="mailto:kafentz@csd.uoc.gr">kafentz@csd.uoc.gr</a> <i>Web:</i> <a href="http://www.csd.uoc.gr/~kafentz">www.csd.uoc.gr/~kafentz</a>
INTRODUCTION	Dr Kafentzis is an experienced computer scientist trained as a signal processing and machine learning engineer with over 10 years of research experience in speech signal processing and over 5 years in machine learning applications in speech. Dr Kafentzis has extensively worked in academia (Univ. of Crete, Univ. of Rennes 1), industrial R&D departments (Orange, Toshiba) and startups (VoiceSignals, Hyfe AI) in various aspects of signal processing including speech analysis, transformations, synthesis, speech recognition, glottal analysis, text-to-speech synthesis, and predictive models for speech and audio. He also has extensive experience in technical and textbook writing and in teaching. Dr Kafentzis is the author of <i>Continuous and Discrete Time Signal Processing: an introduction</i> , a textbook adopted by several Computer Science and Engineering departments in Greece.	
RESEARCH INTERESTS	Speech and Audio Processing, Signal Analysis, Pattern Recognition, Machine Learning, Healthcare Technology	
EDUCATION	<a href="#">University of Crete</a> , Heraklion, Crete, Greece  Ph.D. (joint supervision), <a href="#">Computer Science Department</a> , January 2011 - July 2014 <ul style="list-style-type: none"><li>• GPA: 9.22/10.0</li><li>• Thesis Topic: <i>Adaptive Sinusoidal Models for Speech with Applications on Speech Modifications and Audio Analysis</i></li><li>• Primary Advisor: <a href="#">Professor Yannis Stylianou</a></li><li>• Area of Study: Computer Science</li></ul> M.Sc., <a href="#">Computer Science Department</a> , February 2008 - October 2010 <ul style="list-style-type: none"><li>• Thesis Topic: <i>On the Inverse Filtering of Speech</i></li><li>• Advisor: <a href="#">Professor Yannis Stylianou</a></li><li>• Area of Study: Signal Processing</li></ul> B.Sc., <a href="#">Computer Science Department</a> , September 2001 - December 2007 <ul style="list-style-type: none"><li>• Area of Study: Telecommunications and Networks</li></ul> <a href="#">University of Rennes 1</a> , Rennes, France  Ph.D. (joint supervision), <a href="#">University of Rennes 1</a> , January 2011 - July 2014 <ul style="list-style-type: none"><li>• Thesis Topic: <i>Adaptive Sinusoidal Models for Speech with Applications on Speech Modifications and Audio Analysis</i></li><li>• Distinction: Très Honorable (With Honours)</li><li>• Area of Study: Signal Processing and Telecommunications</li><li>• Primary Advisor: Professor Olivier Boeffard</li></ul>	
ACADEMIC APPOINTMENT	<b>Lecturer</b> <a href="#">Computer Science Department</a> , <a href="#">University of Crete</a>	December 2023 to this day
	<b>Adjunct Lecturer</b> <a href="#">Computer Science Department</a> , <a href="#">University of Crete</a>	October 2015 to December 2023
PROFESSIONAL EXPERIENCE	<a href="#">Hyfe AI</a> , USA <i>Senior Signal Processing and ML Engineer</i>	February 2023 to this day

*Cough audio analysis and classification*

Details: cough audio features implementation, feature selection and AI algorithm implementation (LR, SVM, RF, etc) for cough detection and classification from continuous audio

Tools, Languages, and APIs: Python, Numpy, Scipy, Sci-kit Learn, TensorFlow

**Hyfe AI**, USA

*Contractor*

November 2022 to January 2023

*Cough audio analysis and classification*

Details: implementation of an acoustic event detector suitable for cough event detection

Tools, Languages, and APIs: Python, Numpy

**VoiceSignals LLC**, USA

*Senior Signal Processing and AI Engineer*

May to September 2021

*Personality Prediction from speech signals*

Details: speech features implementation, feature selection and AI algorithm implementation (SVM, LR, RF) for speaker emotion and personality classification from speech signals

Tools, Languages, and APIs: Python, Sci-kit Learn

**Toshiba Europe**, Toshiba Europe Limited, Cambridge, U.K.

*Contractor*

June 2015 to July 2017

*Sinusoidal-based Text to Speech Synthesis*

Details: application of sinusoidal-based vocoders in DNN-based speech synthesis, neural architectures for acoustic modeling in ASR systems

Tools, Languages, and APIs: MATLAB, Python (Keras, Tensorflow)

**Toshiba Europe**, Toshiba Europe Limited, Cambridge, U.K.

*Contractor*

January 2015 to March 2015

*Sinusoidal-based Text to Speech Synthesis*

Details: phase-based approaches for increasing synthetic speech quality

Tools, Languages, and APIs: MATLAB

**Orange**, Orange Labs, Lannion, France

*Researcher*

January 2011 to December 2013

*Speech Modifications based on adaptive Sinusoidal Models*

Details: mathematical modeling of speech using adaptive sinusoidal models, with applications in speech modification (time and pitch scaling)

Tools, Languages, and APIs: MATLAB

**Orange**, Orange Labs, Lannion, France

*Intern*

September 2008 to December 2008

*Development of an Analysis/Synthesis/Modification system of speech*

Details: code translation (MATLAB to C) for a state-of-the-art AR+LF model of speech analysis-transformation-resynthesis

Tools, Languages, and APIs: C

INVITED  
LECTURES

**University of Montana**

- “AI in Healthcare”, February, 2024

**Department of Philology, University of Ioannina**

- “Computational Linguistics: an overview”, March, 2023

**Department of Philology, University of Crete**

- “Sinusoidal Models in Speech Signal Processing: A Tutorial Review”, March, 2013

AWARDS

**Institute of Computer Science - Foundation of Research and Technology Hellas**

- Undergraduate Scholarship, 2007
- Graduate Scholarship, 2008-2010

PARTICIPATION IN  
RESEARCH  
PROJECTS

- **ENRICH** Marie-Curie European Training Network Oct. 2016 to Sept. 2020  
“Enriched Communication Across the Lifespan”

Member of the research team on behalf of the University of Crete

- Post-doctoral Researcher of project “Neural Network Architectures for Automatic Speech Recognition”, funded by Toshiba Research Europe Limited.

PARTICIPATION IN  
COMMITTEES

*PhD*

- Xavier Sarasola Aramendia, *Application of singing synthesis techniques to Bertso-laritzza*, University of the Basque Country: Committee Member (Dec. 2020).

*MSc*

- Ander Gonzalez Docasal, *Noisy Speech Recognition using Kaldi and Neural Archi- tectures*, University of the Basque Country: Committee Member (Jun. 2018).

*BSc*

- I have co-supervised a number ( $> 10$ ) of BSc theses at the Computer Science De- partment, Univ. of Crete. All of them are related to Digital Signal Processing and its applications in speech and audio (Sept. 2015 - now).

TEACHING  
EXPERIENCE

**University of Crete**, Heraklion, Crete, Greece.

*Adjunct Lecturer/Lecturer*

October 2015 to -

- **CS 215**: Signals and Systems
- **CS 370**: Digital Signal Processing
- **CS 112**: Physics for Engineers
- **CS 578**: Digital Speech Signal Processing (as invited lecturer)

TECHNICAL SKILLS Programming: C, Python (NumPy, SciPy, Pandas) Java, JavaScript, PHP, UNIX shell scripting, SQL, MATLAB, and others

Machine Learning: Keras, Tensorflow, Sci-kit Learn

Operating Systems: Microsoft Windows family (from Win 3.1 to Windows 11), Ubuntu

MATHEMATICAL  
EXPERTISE

Real and Complex Analysis, Fourier Theory

ENGINEERING  
EXPERTISE

Signal Processing, Machine/Deep Learning, Image Processing, Speech Signal Analysis, Probabilistic Models, Stochastic Processes, Estimation Theory, Telecommunications, In- formation Theory

LANGUAGES

Greek (fluent), English (fluent), French (elementary)

SCHOOLS AND  
WORKSHOPS

- Chief of Communication at the **Speech Processing Courses in Crete** Summer School of 2022, held at ICASSP 2022
  - Instructor of hands-on session on deep architectures for TTS.
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2021
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2020
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2019
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2018
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2017
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2016
  - Instructor of hands-on session on Adaptive Sinusoidal Models.
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2015
  - Instructor of hands-on session on Adaptive Sinusoidal Models.
- Co-organizer of the **Speech Processing Courses in Crete** Summer School of 2014
- Participation in IEEE Winter School on Speech and Audio Processing for Immersive Environments and Future Interfaces

REVIEWER IN JOURNALS	<p>IEEE Signal Processing Letters  IEEE/ACM Transactions on Audio, Speech, and Language Processing  IEEE Transactions on Affective Computing  Computer Speech &amp; Language Journal (Elsevier)  Speech Communication (Elsevier)  Circuits, Systems, and Signal Processing (Springer)  Journal of Acoustic Society of America  MDPI Sensors  MDPI Applied Acoustics  MDPI Signals  MDPI Applied Sciences  MDPI Information  Intelligent Computing (AAAS)</p>
REVIEWER IN CONFERENCES	<p>IEEE International Conference on Acoustics, Speech, and Signal Processing  EURASIP European Signal Processing Conference  IEEE Global Signal Processing Conference  ISCA Interspeech  Digital Audio Effects Conference (DAFx)  Iberspeech  IEEE International Conference on Biomedical and Health Informatics</p>
BOOKS	<p><b>Kafentzis G.P.</b>, <i>Continuous and Discrete Time Signal Processing: an introduction</i>, Gutenberg, 2019, ISBN: 978-960-01-2042-4.</p>
REFEREED JOURNAL PUBLICATIONS	<p>Caetano M., <b>Kafentzis G.P.</b>, Mouchtaris A., and Stylianos Y., Full-Band Quasi-Harmonic Analysis and Synthesis of Musical Instrument Sounds with Adaptive Sinusoids. In: <i>Applied Sciences</i>, Special Issue on Audio Signal Processing.</p> <p>Koutrouvelis A. I., <b>Kafentzis G.P.</b>, Gaubitch N. D., and Heusdens R., A Fast High-Resolution Method for Glottal Opening/Closure Instant Estimation of Speech. In: <i>IEEE/ACM Transactions on Acoustics, Speech, and Language Processing</i>.</p> <p>Sfakianaki A., <b>Kafentzis G.P.</b>, Nicolaidis K., Temporal, spectral and amplitude characteristics of the Greek fricative /s/ in hearing-impaired and normal-hearing speech. In: <i>Clinical Linguistics and Phonetics</i>, 2024.</p> <p>Pentari A., <b>Kafentzis G.P.</b>, Tsiknakis E., Speech Emotion Recognition via Graph-based Representations. In: <i>Nature Scientific Reports</i>, 2024.</p>
CONFERENCE PUBLICATIONS	<p><b>Kafentzis G.P.</b>, Stylianos Y., and Alku P., Glottal Inverse Filtering using Stabilised Weighted Linear Prediction. In: <i>International Conference on Acoustics, Speech, and Signal Processing 2011</i>, Prague, Czech Republic, May 22-27, 2011.</p> <p><b>Kafentzis G.P.</b>, Pantazis Y., Rosec O., and Stylianos Y., An Extension of the Adaptive Quasi Harmonic Model. In: <i>International Conference on Acoustics, Speech, and Signal Processing 2012</i>, Kyoto, Japan, March 25-30, 2012.</p> <p><b>Kafentzis G.P.</b>, Rosec O., and Stylianos Y., On the Modeling of Voiceless Stop Sounds of Speech using Adaptive Quasi-Harmonic Models. In: <i>Interspeech 2012</i>, Portland, U.S.A., September 9-13, 2012.</p> <p><b>Kafentzis G.P.</b>, Degottex G., Rosec O., and Stylianos Y., Time-scale Modifications based on a Full-Band Adaptive Harmonic Model. In: <i>International Conference on Acoustics, Speech, and Signal Processing 2013</i>, Vancouver, Canada, May 26-31, 2013.</p> <p>Caetano M., <b>Kafentzis G.P.</b>, Mouchtaris A., and Stylianos Y., Adaptive Sinusoidal Modelling of Percussive Musical Instrument Sounds. In: <i>European Signal Processing Conference</i>, Marrakech, Morocco, September 9-13, 2013.</p> <p>Caetano M., <b>Kafentzis G.P.</b>, Degottex G., Mouchtaris A., and Stylianos Y. Evaluating How Well Filtered White Noise Models the Residual from Sinusoidal Modeling of Musical Instrument Sounds. In: <i>IEEE Workshop on Applications of Signal Processing to Audio and Acoustics</i>, New Paltz, New York, October 20-23, 2013.</p>

- Kafentzis G.P.**, Degottex G., Rosec O., Stylianos Y., Pitch-scale Modifications based on an Adaptive Harmonic Model. In: *International Conference on Acoustics, Speech, and Signal Processing 2014*, Florence, Italy, 2014.
- Kafentzis G.P.**, Rosec O., Stylianos Y., Robust Full-band Adaptive Sinusoidal Analysis and Synthesis of Speech. In: *International Conference on Acoustics, Speech, and Signal Processing 2014*, Florence, Italy, 2014.
- Kafentzis G.P.**, Yakoumaki T., Mouchtaris A., Stylianos Y., Analysis of Emotional Speech using an Adaptive Sinusoidal Model. In: *European Signal Processing Conference*, Lisbon, Portugal, 2014.
- Yakoumaki T., **Kafentzis G.P.**, Stylianos Y., Emotional Speech Classification using an adaptive Sinusoidal Model. In: *Interspeech 2014*, Singapore, 2014.
- Caetano M., **Kafentzis G.P.**, and Mouchtaris A., Adaptive Modeling of Synthetic Non-stationary Sinusoids. In: *International Conference on Digital Audio Effects (DAFx)*, Trondheim, Norway, 2015.
- Kafentzis G.P.**, Stylianos Y., High-Resolution Sinusoidal Modeling of Unvoiced Speech. In: *International Conference on Acoustics, Speech, and Signal Processing 2016*, Shanghai, China, 2016.
- Sfakianaki A., **Kafentzis G.P.**, Assessing voice features of Greek speakers with hearing loss. In: *1st Conference on Interdisciplinary Approaches to Linguistic Theory*, Rhethymon, Crete, Greece, 2017.
- Nicolaidis K., Sfakianaki A., Vlahavas G., **Kafentzis G.P.**, An Acoustic Study of Greek Voiceless Stops. In: *International Congress of Phonetic Sciences*, Melbourne, Australia, 2019.
- Sfakianaki, A., **Kafentzis, G. P.**, Kiagiadaki, D., Vlahavas, G., Effect of face mask and noise on word recognition by children and adults. In: *International Conference of Experimental Linguistics*, 2021.
- Sfakianaki A., **Kafentzis G.P.**, Investigating voice function characteristics of Greek speakers with hearing loss using automatic glottal source feature extraction. In: *Interspeech 2021*, Shanghai, China, 2021.
- Kafentzis, G. P.**, Sfakianaki, A., Stylianos, Y., Employing the use of tablet PCs in instruction and partly automatizing the assessment process of online university courses during the COVID era. In: *Proceedings of the Innovating Higher Education Conference 2021*, Bari, Italy, 2021.
- Pentari, A., **Kafentzis, G. P.**, Tsiknakis, E., Investigating Graph-based Features for Speech Emotion Recognition. In: *IEEE International Conference on Biomedical and Health Informatics*, Ioannina, Greece, 2022.
- Sfakianaki, A., **Kafentzis, G. P.**, Stylianos, Y., The GrHarvard Corpus A Greek sentence corpus for speech technology research and applications. In: *3rd Summit on Gender Equality in Computing*, 2021.
- Pentari, A., **Kafentzis, G. P.**, Tsiknakis, E., Depression Recognition from Speech Graph-based Analysis of Speech Signals. In: *4th Summit on Gender Equality in Computing*, 2022.
- Kafentzis, G. P.**, On the Parameter Estimation of Sinusoidal Models for Speech and Audio Signals, arXiv preprint arXiv:2401.01255.
- Kafentzis, G.P.**, Tetsing S., Brew J., Jover L., Galvosas M., Chaccour C., and Small, P. M., Predicting Tuberculosis from Real-World Cough Audio Recordings and Metadata. In: *ArXiv: arXiv:2307.04842* .

OTHER  
PUBLICATIONS

ONLINE

- Personal Webpage: <https://www.csd.uoc.gr/~kafentz>
- Google Scholar: <https://scholar.google.com/citations?user=DszuTk8AAAAAJ&hl=en>
- Orchid ID: <https://orcid.org/0000-0001-9701-1950>
- ResearcherID: <https://publons.com/researcher/T-1665-2019/>
- ResearchGate: [https://www.researchgate.net/profile/George\\_Kafentzis2](https://www.researchgate.net/profile/George_Kafentzis2)
- LinkedIn: <https://www.linkedin.com/in/george-kafentzis-87742323/>

REFERENCES  
AVAILABLE TO  
CONTACT

**Prof. Yannis Stylianou** (e-mail: [yannis@csd.uoc.gr](mailto:yannis@csd.uoc.gr))

- Professor, [Computer Science Department](#), [University of Crete](#)
- [Research Manager](#), Apple U.K.
- *Prof. Stylianou was my undergraduate and graduate (M. Sc.) supervisor and my Ph.D. advisor on behalf of the University of Crete.*

**Dr. Athanasios Mouchtaris** (e-mail: [mouchta@amazon.com](mailto:mouchta@amazon.com))

- [Applied Science Manager](#), Amazon
- *I have collaborated with Prof. Mouchtaris for applications of adaptive Sinusoidal Models in audio analysis.*

**Prof. Paavo Alku** (e-mail: [Paavo.Alku@tkk.fi](mailto:Paavo.Alku@tkk.fi))

- Professor, [Laboratory of Acoustics and Audio Signal Processing](#), [Aalto University](#)
- *I worked with Prof. Alku for a short period of time for my M.Sc. thesis and our work was submitted and accepted for ICASSP '11.*

**Dr. Olivier Rosec** (e-mail: [olivier.rosec@voxygen.fr](mailto:olivier.rosec@voxygen.fr))

- R & D Director, [Voxygen S.A.](#)
- *Dr. Rosec supervised my PhD on behalf of Orange Labs.*

**Prof. Olivier Boeffard** (e-mail: [olivier.boeffard@univ-rennes1.fr](mailto:olivier.boeffard@univ-rennes1.fr))

- Professor, [University of Rennes 1](#),
- *Prof. Boeffard was my PhD advisor on behalf of the University of Rennes 1.*