Emmanouil Theofanis **Chourdakis**

Electronic Engineer / Computer Scientist (Dipl.-Ing, MSc, PhD) – Audio / DSP / Machine Learning

etchourdakis@gmail.com | mmxgn.github.io | mmxgn | echourdakis | Emmanouil Theofanis Chourdakis

Skills

Computer Languages	Python, Matlab, C, C++, Javascript, HTML.
Audio Processing / Plugin Development	Juce (VST, AAX),Faust, Essentia, WAET (listening tests), DAWs, Sonic-Visualiser, Praat.
Data Science / Machine Learning	R, NumPy, Pandas, Scikit-Learn, Keras (Tensorflow), Pytorch, SpaCy, NLTK, SQL.
Operating Systems / Misc	Linux, Git, Docker, Anaconda, LaTeX.
Human Languages	English (TOEFL, 6+ years in London), Greek (native language).

Industry Experience

Nomono *London, UK*

Research Engineer *Feb. 2020 -*

- Research, development, and evaluation of algorithms for audio processing.

BBC Audio R&D *London, UK*

Intern *Dec. 2018 - Apr. 2019*

- Developed adaptive audio effects as Web Audio Worklets using Javascript and the Web Audio API for use in an internally developed storyboard system. Developed a variety of scripts that allows rapid prototyping of such effects.
- Developed a Flask-based API for Music Information Retrieval (MIR) using Docker, SQLite, and the Essentia MIR library that did audio content analysis using deep learning to control the aforementioned effects.
- Implemented an object mixing method for hard of hearing listeners as a plugin for VST hosts, as well as Avid Pro Tools using Faust, C++, and Juce.
- Published a peer-reviewed paper on using probabilistic programming and machine learning to automate the mixing process of the above object-based effect.
- Wrote extensive internal guides for building audio effects for the web as well as VST and AAX plugins.

Academic Experience

Queen Mary University of London *London, UK*

PhD Candidate *Apr. 2015 -*

- Program Committee (PC) Member for the Sound And Music Computing 2019 and 2020 Technical Programs (SMC 2019/2020).
- PC Member for the China Conference on Sound and Music Technology 2018 Technical Program (CSMT 2018).
- Sub-reviewer for the 2018 International Conference on Digital Audio Effects (DAFx 2018).
- Teaching Assistant for supporting Matlab-based MSc final projects.
- Teaching Assistant for the Music and Speech processing and Advanced Transform Methods postgraduate modules.
- Script marking for the Digital Signal Processing module.
- Paper session chair for the Digital Signal Processing technical track of the 146th AES Convention (April 2019, Dublin, Ireland).
- Poster session chair for the 2nd Workshop on Intelligent Music Production (September 2016, London, UK).
- Staff Volunteer for the #AudioMusicHackathon hackday (July 2015, London, UK).

Education

Queen Mary University of London *London, UK*

PhD in Computer Science (Successfully defended – Pending corrections) *April 2020*

- Thesis titled “Computational Methods for Assisting Radio Drama Production”.
- Use of Artificial Intelligence to assist an aspiring radio drama team in producing radio drama.
- Heavily based around Natural Language Processing techniques, and Information Retrieval.

Queen Mary University of London *London, UK*

MSc in Digital Music Processing (Graduated with distinction – 80/100) *September 2014*

- Thesis project used Machine Learning to understand a song track’s audio with the goal to control an audio effect for applying reverberation.
- 2014 Michael Clark Prize for Best Electronic Engineering Project

Technical University of Crete *Chania, Greece*

Electronic and Computer Engineering Diploma (Graduated with mark “Very Good” – 7.46/10) *July 2011*

- Thesis project used inductive logic programming to learn musical composition rules from examples to compose similar ones.

Related work samples (Click on project title to proceed to the corresponding github repository)

PyopenAL-HRTF	HRTF extensions for the Python OpenAL bindings.
Genre-Recognition	A Music Genre Classifier using transfer learning developed with MusiCNN, XGBoost, and Docker.
Audio-Dafx2019-Automatic	Classification of raw audio to Speech, Music, or Sound Effects using Keras. Also: Modelling of mixing decisions of engineers when mixing for hard-of-hearing listeners.
SimScene.py	Python library and tool for hierarchical construction of acoustical scenes.
Smooth-Convex-KL-NMF	Python library for minibatched NMF for speaker diarization.

Dipl.-Ing/MSc coursework examples (Ask for code samples)

Digital Audio Effects	Implementation of a 4-band dynamic range compressor as a VST using C++ and Juce. Implementation of a subtractive synthesizer as a VSTi using C++ and Juce.
Real Time DSP	Implementation of a real time phase vocoder for MIDI-controlled voice robotisation using C for the BeagleBoneBlack ARM Cortex A8-based single-board computer. Implementation of a gesture controlled drum machine on the BeagleBoneBlack.
Audio and Music Processing	Chord Recognition on "The Beatles" discography using Hidden Markov Models.
Autonomous Agents	A probabilistic model for music cognition in real time.

Related Publications

- E. T. Chourdakis and J. D. Reiss. "A Machine-Learning Approach to Application of Intelligent Artificial Reverberation". In: *Journal of the Audio Engineering Society* 1/2 (Feb. 2017), pp. 56–65
- E. T. Chourdakis et al. "Modelling Experts' decisions on assigning narrative importances of objects in a radio drama mix". In: *22nd International Conference on Digital Audio Effects*. UK, Sept. 2019
- E. T. Chourdakis and J. D. Reiss. "Tagging and Retrieval of Room Impulse Responses Using Semantic Word Vectors and Perceptual Measures of Reverberation". In: *146th Audio Engineering Society Convention*. Ireland, Mar. 2019
- B. Shirley, L. A. Ward, and E. T. Chourdakis. "Personalization of Object-based Audio for Accessibility using Narrative Importance." In: *ACM International Conference on Interactive Experiences for Television and Online Video, Workshop on In-Programme Personalisation*. UK, June 2019
- E.T. Chourdakis and J.D. Reiss. "Grammar Informed Sound Effect Retrieval for Soundscape Generation". In: *DMRN+ 13: Digital Music Research Network*. UK, Dec. 2018
- E. Chourdakis and J.D. Reiss. "From my pen to your ears: automatic production of radio plays from unstructured story text". In: *15th Sound and Music Computing Conference*. July 2018