Emmanouil Theofanis **Chourdakis**

Doctoral Candidate of Computer Science · AI / ML + Audio

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Summary

A **PhD Candidate** at **Queen Mary University of London** who successfully defended on April 1st, 2020 and will be awarded a Doctor's degree once requested amendments are submitted and accepted. Interested in everything that combines AI and Audio and especially when used to assist in human creative processes such as in storytelling, or sound mixing.

Skills

Computer Languages	**Python**, **Matlab**, **C**, **C++**, Faust, Javascript.
Libraries	**NumPy**, **Pandas**, Scikit-Learn, **Keras (Tensorflow)**, **Pytorch**, XGBoost, **Essentia**, **Juce**, NLTK.
Misc	Linux, Docker, Anaconda, **Conducting Listening Tests** using WAET, DAWs, Sonic-Visualiser, Praat, LaTeX, Godot.
Human Languages	English (TOEFL, 6+ years in London), Greek (native language), French (elementary).

Honors & Awards

2014 **Michael Clark Prize for Best Electronic Engineering Project**, Queen Mary University of London *London, UK*

Industry Experience

BBC Audio R&D *London, UK*

Intern *Dec. 2019 - Apr. 2020*

- **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 and the Essentia MIR library that did audio content analysis 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

- Thesis titled "Computational Methods for Assisting Radio Drama Production"
- Use of artificial intelligence to assist an aspiring radio drama team in producing radio drama.

Queen Mary University of London *London, UK*

MSc in Digital Music Processing *September 2014*

- Grade: 80% (Distinction)
- Thesis titled **"Intelligent Application of Artificial Reverberation to Multi-track Mixes"**. Presented during the 60th AES Conference.

Technical University of Crete *Chania, Greece*

Electronic and Computer Engineering Diploma *July 2011*

- "Grade: 7.46 out of 10 (Very Good)"
- Thesis titled **"Computer-aided Music Composition Using Inductive Logic Programming"**. Graded 10 out of 10.

Notable MSC Projects

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.

Notable Dipl.-Eng Projects

Diploma Thesis A system **for learning music composition rules from examples** using Inductive Logic Programming.

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.

Opensource Software

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.

Spacy-Clausie Implementation of Del Corro and Gemmula's ClausIE system in python using SpaCy with bindings for Problog.

MiniePY Python bindings for Gashteovski, Gemulla, and Del Corro's MinIE information extraction system.

SpRL-SpaCy A library for Spatial Role Labelling using SpaCy.

PyopenAL-HRTF HRTF extensions for the Python OpenAL bindings.

SimScene.py Python library and tool for hierarchical construction of acoustical scenes.

Smooth-Convex-KL-NMF Python library for minibatched NMF with sparsity and smoothness constraints.

CharacterAwareNeuralModels A tutorial for step-by-step implementation of Char-LSTM-CNNs in Keras.

Other Published Software

20 Candles A simple touchscreen-based puzzle game for Android (Google Play) and WebGL with procedural level generation.

Notable Publications

- **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
- E. T. Chourdakis and J. D. Reiss. "Constructing narrative using a generative model and continuous action policies". In: *10th INLG Workshop on Computational Creativity in Natural Language Generation*. Sept. 2017
- **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 and J. D. Reiss. "Automatic Control of a Digital Reverberation Effect using Hybrid Models". In: *60th Audio Engineering Society Conference on Dereverberation and Reverberation of Audio, Music, and Speech*. Jan. 2016**