

# Emmanouil Theofanis Chourdakis

ELECTRONIC ENGINEER (DIPL.-ING, MSc, PHD) – AUDIO / DSP / MACHINE LEARNING

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## Industry Experience

### Epidemic Sound

Stockholm, Sweden

MACHINE LEARNING ENGINEER

Apr. 2021 -

- Driving ML model design and development for a key TBA product.
- Contributed code/reviewing/optimisations for the **Create Versions** audio engine.
- Deployed and maintained a subjective listening test platform for internal use.
- Mentored colleagues on Machine Learning for audio.

### Nomono

Trondheim, Norway

AUDIO RESEARCH ENGINEER

Feb. 2021 - Mar. 2024

- Contributed algorithms, code, and reviews for their ML-based **multi-microphone speech enhancement pipeline**.
- Led the initiative for exporting next generation audio (**Dolby Atmos**, Facebook 360, MPEG-H).
- Led experiment for **multi-microphone speech enhancement** subjective evaluation.
- Managed research work packages, mentored colleagues, and contributed to two patent filings.
- Contributed to thought leadership articles, as well as, published and disseminated research to public venues.
- Contributed to their ambisonics and lavalier mic recording functionality in Go.
- **Work contributed to SXSW Innovation Award-winning product.**

### BBC Audio R&D

London, UK

RESEARCH INTERN

Dec. 2018 - Apr. 2019

- Implemented an **object rendering method** for hard of hearing listeners as a plugin for VST hosts, as well as Avid Pro Tools, and the Web, using Faust, C++, Javascript and Juce.
- Published a peer-reviewed paper on using **probabilistic programming** and **machine learning** to automate aforementioned method.

## Education

### Queen Mary University of London

London, UK

PHD IN COMPUTER SCIENCE

April 2020

- Thesis leveraged **Natural Language Processing** to assist an aspiring radio drama team in production.
- Program Committee (PC) Member, Chair, and/or Reviewer for various well known conferences (SMC, CSMT, DAFx, AES, WIMP).
- Assistant for modules on Advanced Transform Methods, Digital Signal Processing, Music & Speech Processing, and others.
- Published 8 first author peer-reviewed papers in workshops, conferences, as well as one journal article (**DAFx**, **AES Journal**, and others. See scholar).

### Queen Mary University of London

London, UK

MSC IN DIGITAL MUSIC PROCESSING (GRADUATED WITH DISTINCTION – 80/100)

September 2014

- Thesis on **Machine Learning** and Multitrack reverberation which won the 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.

## Key Skills

<b>Audio Interests</b>	<b>Deep learning for Audio, Generative ML for audio/music, Audio DSP.</b>
<b>Audio Programming &amp; Evaluation Tools</b>	Juce (VST, AAX), Faust, WAET, WebMUSHRA, GoListen.
<b>Machine Learning &amp; Data Science</b>	<b>Apache Beam, Pytorch, NumPy, Scikit-Learn, Pandas, BigQuery.</b>
<b>Programming &amp; Development Tools</b>	<b>Python, Matlab, C, C++, Go, Linux, Git, Docker, Anaconda, Atlassian (Jira, Confluence),</b> <del>ETX</del> .
<b>Cloud Engineering</b>	AWS, Google Cloud
<b>Language Proficiency</b>	English (TOEFL, 6+ years in London), Norwegian (A1), Greek (native language).

## Public Work Samples \_\_\_\_\_ (Click on project title to proceed to the corresponding github repository)

<b>PYOPENAL-HRTF</b>	Extension of PyopenAL with support for binaural audio
<b>GENRE-RECOGNITION</b>	Demonstration of a machine learning classifier for musical genre recognition
<b>AUDIO-DAFX2019-AUTOMATIC</b>	Use of machine learning for categorizing audio as speech, music, or sound effects Additionally, understands and replicates expert decisions for audio experiences for the hard of hearing
<b>SIMSCENE.PY</b>	Creation of virtual sound environments for evaluating audio event detection systems
<b>SMOOTH-CONVEX-KL-NMF</b>	Speaker diarization in Python
<b>RXYO</b>	Artistic tool for displaying oscilloscope music
<b>YULEWALK</b>	Method for designing arbitrary magnitude response IIR filters in Python
<b>AUDIOMENTATIONS</b>	IIR Filter and Room simulation transforms for data augmentation during training of machine learning models
<b>CLAUCY</b>	Information extraction from natural text. Implemented as an extension to the popular SPACY text processing library.
<b>KAGGLE CONNECT X</b>	A strategic computer agent for the Connect 4 game.
<b>20 CANDLES</b>	A mobile puzzle game for Android with procedurally generated levels.
<b>OTHER</b>	Contributions to various open-source software projects, including popular audio libraries (please ask).

## Patents \_\_\_\_\_

- **WO2023170283A1, AU2023230241A – E.T.Chourdakis – Method for processing an audio signal**  
Low cost method for efficiently detecting and suppressing unwanted frequency peaks.

## Notable Publications \_\_\_\_\_

- **E.T. Chourdakis, J.D. Reiss – Grammar Informed Sound Effect Retrieval for Soundscape Generation**  
*DMRN+ 13: Digital Music Research Network, UK, December 2018*  
Presented an efficient technique for sound retrieval from libraries using natural language queries.
- **E.T. Chourdakis, J.D. Reiss – Automatic Control of a Digital Reverberation Effect using Hybrid Models**  
*60th Audio Engineering Society Conference on Dereverberation and Reverberation of Audio, Music, and Speech, January 2016*  
Introduced a novel technique to adjust a reverberation effect based on user preferences and audio characteristics.
- **E.T. Chourdakis, J.D. Reiss – A Machine-Learning Approach to Application of Intelligent Artificial Reverberation**  
*Journal of the Audio Engineering Society, 1/2, 56-65, February 2017*  
Elaborated on the previous paper by adding a perceptual evaluation and a technique for mapping perceptual parameters to filter coefficients of an algorithmic reverb.
- **E.T. Chourdakis, J.D. Reiss – Constructing narrative using a generative model and continuous action policies**  
*10th INLG Workshop on Computational Creativity in Natural Language Generation, September 2017*  
Delved into the use of reinforcement learning to generate cohesive narratives.
- **E.T. Chourdakis, J.D. Reiss – From my pen to your ears: automatic production of radio plays from unstructured story text**  
*15th Sound and Music Computing Conference, July 2018*  
Proposed an innovative approach for autonomously transforming unstructured texts into radio plays.
- **B Shirley, LA Ward, ET Chourdakis – Personalization of Object-based Audio for Accessibility using Narrative Importance**  
*ACM International Conference on Interactive Experiences for Television and Online Video, Workshop on In-Programme Personalisation, UK, June 2019*  
Investigated the use of narrative importance in personalising object-based audio for better accessibility. My role primarily involved implementing the proposed VST/AAX effects.
- **E.T. Chourdakis, J.D. Reiss – Tagging and Retrieval of Room Impulse Responses Using Semantic Word Vectors and Perceptual Measures of Reverberation**  
*146th Audio Engineering Society Convention, Ireland, March 2019*  
Debuted a system to index and retrieve room impulse responses based on their auditory impact, even if imprecisely described.
- **C Angonin, ET Chourdakis, RA Åeng – Assessing the relevance of perceptually driven objective metrics in the presence of handling noise**  
*152nd Audio Engineering Society Convention, Netherlands, May 2022*  
Determined thresholds where handling noise prominently impacts perceptual speech quality metrics like PESQ and CDPAM. I played a supervisory role and contributed to the coding and manuscript development.
- **ET Chourdakis, L Ward, M Paradis, JD Reiss – Modelling Experts' decisions on assigning narrative importances of objects in a radio drama mix**  
*22nd International Conference on Digital Audio Effects, UK, September 2019*  
Leveraged convolutional neural networks to classify audio objects and probabilistic modelling to simulate mixer engineers' decision-making. Aimed to automate the transition of BBC's vast library of older radio programmes to object-based audio.