

# Nikolaos DIONELIS

## CONTACT DATA

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WEBSITES: [\(click here\)](#), [\(click here\)](#)

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PHONE: +447873286106

EU CITIZEN, EEA NATIONAL

## EDUCATION AND QUALIFICATIONS

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### 2015–2019 Imperial College London, UK: PhD Degree in Signal Processing

Electrical Engineering Dpt, Communications and Signal Processing Group, [\(click here\)](#)

Engineering Physical Sciences Research Council (EPSRC) Doctoral Training Award

Research Interests: Machine learning; Deep learning; Signal processing; Nonlinear filtering; Audio and acoustics; Speech enhancement, separation, and recognition; Blind dereverberation; Speech diarization; Multimodal audio-visual fusion; Affective computing; Emotion detection

Programming: Python and C++. Coding in Python: PyTorch, TensorFlow, Keras, Chainer, PyCharm IDE, and Spyder IDE. Experience with Git. NNs with PyTorch. GitHub: [\(click here\)](#)

PhD Thesis: “Modulation-domain Kalman filtering for single-channel speech enhancement, dereverberation, and denoising”. Supervisors: Mike Brookes and Prof. Patrick A. Naylor

PhD Degree: [\(click here\)](#). Russell Group university. Courses: Machine Learning, Optimization

### 2011–2015 Imperial College London, UK: Masters MEng Degree in Electrical Engineering

MEng Degree Courses: Machine Learning for Computer Vision (84%); Mathematics for Signals and Systems (82%); Digital Signal Processing (85%); Spectral Estimation and Adaptive Signal Processing (71%); Wavelets and Applications (76%); Advanced Signal Processing (73%)

MEng Credits ECTS: 261. Overall Grade: First Class Honours, 1st (72.8%)

Fourth Year: Total Grade: 1st (75.5%). Third Year: Total Grade: 1st (75.5%)

Electrical Engineering Masters MEng Including Batchelors Transcript: [\(click here\)](#)

Coursework for (1) Machine Learning, (2) Optimization, and (3) Wavelets: [\(click here\)](#)

Third Year Group Project, Floating-Point Unit (FPU) Design: [\(click here\)](#) and [\(click here\)](#)

Research: [\(click here\)](#). Fourth Year Dissertation Project on Signal Processing: [\(click here\)](#)

### 2000–2011 Hellenic American Educational Foundation (HAEF) Athens College

International Baccalaureate (40/45); Mathematics A-level (A); IELTS (7.5)

## PUBLICATIONS

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- 2021 N. Dionelis, M. Yaghoobi, and S. Tsafaris, “BVideoGAN: Robust Boundary-based Video Prediction for Anomaly Detection,” Work in Progress, March 2021.
- 2021 N. Dionelis, M. Yaghoobi, and S. Tsafaris, “OMASGAN: Out-of-Distribution Minimum Anomaly Score GAN for Anomaly Detection, Sample Generation on the Boundary, and Negative Sampling and Model Retraining by Including the Negative Samples,” Paper Submitted for Publication, 2021.
- 2020 N. Dionelis, M. Yaghoobi, and S. Tsafaris, “Boundary of Distribution Support Generator (BDSG): Sample Generation on the Boundary,” in Proceedings IEEE International Conference on Image Processing (ICIP), pp. 803-807, 2020. Online: [\(click here\)](#), [\(click here\)](#)
- 2020 N. Dionelis, M. Yaghoobi, and S. Tsafaris, “Tail of Distribution GAN: GAN-Based Boundary of Distribution Formation,” in Proceedings Sensor Signal Processing for Defence (SSPD), pp. 41-45, 2020. Online: [\(click here\)](#), [\(click here\)](#)
- 2020 N. Dionelis, M. Yaghoobi, and S. Tsafaris, “Research Proposal for Anomaly Detection in Images, Temporal Data, and Multimodal Data,” Technical Report on Anomaly Detection, Generative Models, and Generative Adversarial Networks. Online: [\(click here\)](#), [\(click here\)](#)
- 2019 N. Dionelis, “Literature Review of Methods for Anomaly Detection,” Technical Report on

## PUBLICATIONS (CONTINUED)

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- Deep Generative Models and Generative Adversarial Networks. Online: ([click here](#)), ([click here](#))
- 2019 **N. Dionelis**, “Modulation-Domain Kalman Filtering for Speech Enhancement, Dereverberation, and Noise Suppression,” PhD Thesis, Imperial College London, UK, Sept. 2019. Online: ([click here](#))
- 2019 **N. Dionelis** and M. Brookes, “Modulation-Domain Kalman Filtering for Monaural Blind Speech Denoising and Dereverberation,” IEEE ACM Transactions on Audio, Speech, and Language Processing, vol. 27, no. 4, pp. 799-814, 2019. Online: ([click here](#)), ([click here](#))
- 2018 **N. Dionelis** and M. Brookes, “Phase-Aware Single-Channel Speech Enhancement with Modulation-Domain Kalman Filtering,” IEEE ACM Transactions on Audio, Speech, and Language Processing, vol. 26, no. 5, pp. 937-950, 2018. Online: ([click here](#)), ([click here](#))
- 2018 **N. Dionelis** and M. Brookes, “Modulation-Domain Filtering in the Bark Spectral Domain,” in Proceedings European Signal Processing Conference (EUSIPCO). Online: ([click here](#))
- 2018 **N. Dionelis**, “Single-Channel Speech Enhancement and Non-Linear Modulation-Domain Kalman Filtering,” arXiv preprint arXiv:1811.00078, Oct. 2018. Online: ([click here](#)), ([click here](#))
- 2017 **N. Dionelis** and M. Brookes, “Modulation-Domain Speech Enhancement,” in Proceedings Hands-Free Speech Communication and Microphone Arrays, San Francisco. Online: ([click here](#))
- 2017 **N. Dionelis** and M. Brookes, “Speech Enhancement Using Modulation-Domain Filtering with Speech Level Normalized Priors,” in Proceedings EUSIPCO. Online: ([click here](#))
- 2016 **N. Dionelis** and M. Brookes, “Active Speech Level Estimation in Noisy Signals with Quadrature Noise Suppression,” in Proceedings EUSIPCO. Online: ([click here](#)). Speech recordings: ([click here](#))
- 2015 **N. Dionelis**, “Adaptive Power Spectrum Estimation of Non-Stationary Acoustic Noise,” Masters MEng Degree Dissertation, Electrical and Electronic Engineering Dpt, Signal Processing Group, Imperial College London, UK, 2015. Online: ([click here](#))
- 2015 **N. Dionelis**, “Analysis of the ECG and Photoplethysmography (PPG) Signals,” Signal Processing and Biomedical Engineering, Masters MEng Electrical & Electronic Engineering Degree, Imperial College London, UK, and Toumaz Sensium Healthcare, UK, 2015. Online: ([click here](#))
- Reviewer: IEEE Transactions, 6 times; Speech Communication, EURASIP Journal, 3 times  
Sensor Signal Processing for Defence (SSPD) 2020, ([click here](#)), ([click here](#)); InterSpeech, ([click here](#))

## KEY RESEARCH FINDINGS

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- 2020 **N. Dionelis**, M. Yaghoobi, and S. Tsiftaris, “Boundary of Distribution Support Generator (BDSG): Sample Generation on the Boundary,” in Proceedings IEEE International Conference on Image Processing (ICIP), pp. 803-807, 2020. Online: ([click here](#)), ([click here](#))
- 2021 **N. Dionelis**, M. Yaghoobi, and S. Tsiftaris, “OMASGAN: Out-of-Distribution Minimum Anomaly Score GAN for Anomaly Detection, Sample Generation on the Boundary, and Negative Sampling and Model Retraining by Including the Negative Samples,” Paper Submitted for Publication, 2021.
- 2020 **N. Dionelis**, M. Yaghoobi, and S. Tsiftaris, “Tail of Distribution GAN: GAN-Based Boundary of Distribution Formation,” in Proceedings Sensor Signal Processing for Defence (SSPD), pp. 41-45, 2020. Online: ([click here](#)), ([click here](#))
- 2021 **N. Dionelis**, M. Yaghoobi, and S. Tsiftaris, “BVideoGAN: Robust Boundary-based Video Prediction for Anomaly Detection,” Work in Progress, March 2021.

## WORK EXPERIENCE

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- 2019 – TODAY | UNIVERSITY DEFENCE RESEARCH COLLABORATION (UDRC), UK  
UDRC in Signal Processing: ([click here](#)), University of Edinburgh  
Postdoc Research Associate in Machine Learning: ([click here](#)), ([click here](#))  
Research on and development, optimisation, and validation of Robust Generative Neural Networks, including Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), Invertible Residual Networks (IResNets).

## WORK EXPERIENCE (CONTINUED)

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- Unsupervised and semi-supervised anomaly detection in images, videos, audio, and multimodal data. Developing a Python-based data analysis framework. Performing statistical analyses, hypothesis testing. Start date: 18 March 2019  
Conducting research on: Deep learning, scalable models, state-of-the-art deep generative models, unsupervised learning, semi- and self-supervised learning, anomaly detection, images and videos, computer vision, visual scene understanding, multimodal data such as text and images, automatic negative data augmentation, segmentation and detection of anomalies, detection of items of concern, few-shot learning, meta-learning. UoE Presentation: ([click here](#))
- 2016 – 2019 | IMPERIAL COLLEGE LONDON, UK  
Graduate Teaching Assistant, Electrical Engineering, MEng Degree Courses
- 2015 | TOUMAZ SENSIVUM HEALTHCARE, UK  
Signal Processing: ECG and Photoplethysmography (PPG). Report: ([click here](#))
- 2013 | TRANSMART CONSULTING, Athens, Greece  
Participated in the preparatory work for three business project proposals for shipping, (civil) transportation, and airplane companies. Duration: 6 weeks
- 2013 | HELLENIC CIVIL AVIATION AUTHORITY, Athens, Greece  
Familiarized with the air navigation and air traffic control systems of the civil aviation and the Greek Flight Information Region (FIR). Duration: 6 weeks
- 2013 | NATIONAL TECHNICAL UNIVERSITY OF ATHENS, Greece  
Department of Transportation Planning and Engineering: Responsible for collecting data/metadata regarding the Transport System. Duration: 4 weeks
- 2013 | POSTSCRIPTUM MEDIA DESIGN, Athens, Greece  
Responsible for the design and maintenance of websites that aim to promote popular tourist destinations, attractions, and museums. Duration: 6 weeks

## INTERESTS AND RESPONSIBILITIES

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2019, Imperial College London, Imperial - MIT Global Fellows Programme: ([click here](#))  
2017, Courses during PhD: Statistical Machine Learning, Optimisation, ([click here](#))  
2015, Imperial College Business School, Summer Courses: Finance (71%), ([click here](#)); Business Strategy and Consulting. Intensive Programme: 7 weeks. Credits ECTS: 14  
Teamwork: I have worked in various types of research teams in different research projects during my current PostDoc Research Associate position at the University of Edinburgh and the UDRC and during my PhD and Masters MEng degrees at Imperial College London.  
Organisational Skills: During my PostDoc Research Associate position at the University of Edinburgh and the UDRC and during my PhD and Masters MEng degrees at Imperial College London, I have organized presentations on research methods and on signal processing.  
Programming Skills: Python, C++, MATLAB. Coding in Python: PyTorch, TensorFlow, Keras, Chainer. Coursera Courses, LinkedIn: ([click here](#))  
Professional Knowledge: Microsoft Excel, Word, PowerPoint. I am competent with all Microsoft Office programmes and I have experience with HTML.  
Languages: English: Fluent Professional; Greek: Mother tongue; French: Basic Knowledge  
Research: ([click here](#)), ([click here](#)). MacBooks: 8C 2.3GHz, 4C 2.9GHz. UK Permanent Residence