

AIDEN DURRANT

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EDUCATION

- PhD Computing Science**, *University of Aberdeen*, UK *May 2020 - Present*
Department of Computing Science, School of Natural and Computing Sciences
Advised by Georgios Leontidis and Mingjun Zhong
- MPhil Computer Science**, *University of Lincoln*, UK *September 2018 - April 2020*
Machine Learning Group, School of Computer Science
Advised by Georgios Leontidis and Stefanos Kollias
- BSc (Hons) Computer Science.**, *University of Lincoln*, UK *September 2015 - May 2018*
School of Computer Science
Grade: 1st Class Honours (Rank: 1/154)

PROJECTS

- Facilitating Data Sharing in Agri-Food Supply Chains.**
IoFT Working Group: Data Sharing and Interoperability.
The working group investigates potential technological solutions to the challenges of data sharing within data trusts for the agri-food sector. Specifically, focusing on federated learning for holistic data analytic between independent data stores / silos.
- Nuclear Reactor Anomaly Classification and Localisation**
Core Monitoring Techniques & Experimental Validation and Demonstration - CORTEX
Developing innovative core monitoring techniques for anomaly detection in nuclear reactors using the inherent fluctuations in the neutron flux. Responsible for devising Machine learning methodologies to invert the reactor transfer function and recover the anomaly responsible for an observed fluctuation.

WORK EXPERIENCE

- University of Aberdeen, UK** March 2021
Associate Demonstrator
- Co-Module Coordinator for the MSc Artificial Intelligence module: Data Mining and Visualisation.
- University of Glasgow, UK** October 2020 - March 2021
Research Assistant - IoFT Working Group: Data Sharing and Interoperability.
- Investigation of the potential technological solutions to challenges posed by data sharing within data trusts for the agri-food sector. Specifically focused on the development of Machine Learning systems enabling data sharing within Data Trusts.
- University of Lincoln, UK** January 2019 - January 2021
Research Assistant Deep Learning - CORTEX Horizon 2020 EU Project.
- The development of bespoke systems for the signal analysis of nuclear reactor instrumentation readings to invert reactor transfer function to classify and localise perturbations from simulated and real readings.
- University of Lincoln, UK** September 2017 - May 2019
Associate Demonstrator (Teaching Assistant)
- Assist with the teaching of lab work and lab assignments, delivering workshop tutorials and tasks. Modules include; Data Mining, Machine Learning, Software Engineering, Mobile Autonomous Robotics, Programming & Data Structures, Cloud Computing.

AWARDS

PhD Poster Award - FISA 2019

June 2019

Euratom Research and Training in Safety of Nuclear Reactors

Best Graduate Award

September 2018

Highest overall grade in the class of 2018 (1/154)

WORKSHOP TALKS / INVITED TALKS

Detection and Localisation of Multiple In-core Perturbations with Neutron Noise-based Self-supervised Domain Adaptation, SAINT

January 2021

SAINT Workshop on The Use of Machine Learning and Artificial Intelligence in Radiation Science

- Invitation by the Swedish Academic Initiative for Nuclear Technology (SAINT) to present and describe our work employing ML in the field of nuclear energy safety.

Machine Learning for Nuclear Data Analysis, PSI

September 2020

Neutron Noise Modelling & Analysis In PWRs Using Commercial Time-domain Based Code.

- Participation in the online workshop hosted by the Paul Scherrer Institut, Nuclear energy and safety division for the explanation and demonstration of nuclear reactor in-core anomaly classification and localisation using machine learning.

PUBLICATIONS

Durrant, A., Markovic, M., Matthews, D., May, D., Leontidis, G., & Enright, J. (2021), 'How might technology rise to the challenge of data sharing in agri-food?', *Global Food Security* **28**, 100493.

Demaziere, C., Mylonakis, A., Vinai, P., Durrant, A., De Sousa Ribeiro, F., Wingate, J., Leontidis, G., & Kollias, S. (2020), Neutron Noise-based Anomaly Classification and Localization using Machine Learning. *Proceedings of International Conference on Physics of Reactors (PHYSOR 2020)*.

Durrant, A., Leontidis, G., & Kollias, S. (2019), '3D Convolutional and Recurrent Neural Networks for Reactor Perturbation Unfolding and Anomaly Detection', *EPJ Nuclear Sci. Technol.* **5**, 20.

PRE-PRINTS / UNDER REVIEW

Durrant, A., Leontidis, G., Kollias, S., Torres, L. A., Montalvo, C., Mylonakis, A., Demaziere, C. & Vinai, P. (2021), Detection and Localisation of Multiple In-core Perturbations with Neutron Noise-Based Self-Supervised Domain Adaptation. *The International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (ANS M&C 2021)*. **Under Review.**

Durrant, A. & Leontidis, G. (2021), Hyperspherically Regularized Networks for BYOL Improves Feature Uniformity and Separability. *International Joint Conference on Artificial Intelligence (IJCAI)*. **Under Review.**