Alexander F. Spies

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Profession

Ph.D. Computer Science (Artificial Intelligence) — Oct 2020 - Present
Imperial College London — *London, UK*
Thesis: *Symbolic Reasoning in Artificial Neural Networks*
Advisors: Prof. A. Russo, Prof. M. Shanahan

Education

Imperial College London — Sep 2019 - Sep 2020
MSc in Computing (AI and ML) - *Classification: Merit, Courses: 77%* — *London, UK*
Thesis: *Unsupervised Learning of World Models in the Animal AI Environment*
Independent Research Project: *Neurosymbolic Learning and Neurally Weighted dSILP*

University of California, Berkeley — Aug 2017 - May 2018
Study Abroad Year, Physics - *GPA: 3.87/4.00* — *Berkeley, CA, USA*
Performed undergraduate research whilst undertaking graduate level courses

University of Manchester — Sep 2015 - Jun 2019
MPhys in Physics (Theoretical) - *Classification: First Class, Courses: 79.8%* — *Manchester, UK*
Thesis: *Artificial Intelligence for the Automated Diagnosis of Atrial Fibrillation*

Professional Experience

German Electron-Synchrotron (DESY) — Jul 2018 - Sep 2018
Research Intern / Student Researcher — *Hamburg, Germany*
- *Performed an Exclusion analysis of Higgs Boson decay channels in the MSSM*

Advisors: Prof. G. Weiglein, Dr. E. Bagnaschi, Dr. T. Stefaniak

Lawrence Berkeley National Laboratory (LBNL) — Feb 2018 - Jul 2018
Undergraduate Researcher — *Berkeley, CA, USA*
- *Investigated Nonlocal Thresholds in Particle Physics pixel detectors* [1]

Advisors: Dr. B. Nachman

Publications

Journal Articles

[1] *Nonlocal Thresholds for Improving the Spatial Resolution of Pixel Detectors*
Nachman, B. and Spies, A.F.
Journal of Instrumentation (**JINST**), Sep 2019.

Workshop Articles

[2] *Sparse Relational Reasoning with Object-Centric Representations*
Spies, A.F., Russo, A. and Shanahan, M.
Dynamic Neural Networks Workshop (**ICML**), July 2022. **(spotlight)**

Awards

Google Cloud Research Grant Aug 2022
1st Place in AIHack 2022 (Generative Hamiltonian Networks to model Microfluidics) Mar 2022
Full Ph.D. Scholarship from UKRI 2020 - 2024
1st Place in StudentHack VII (TamaGotcha - Scan friends and look after their avatars) Mar 2019

Teaching Experience

Deep Learning, *Course Support Leader,* Imperial College, Computing Spring 2021&22

- Developed an autograding framework combining departmental tools with **Otter Grader**
- Aided with course organisation and spearheaded partnership with **Paperspace** for GPUs
- Co-created coursework on Generative Modelling. Created tutorial on **Attention Mechanisms**

Maths for Machine Learning, *Teaching Assistant,* Imperial College, Computing Fall 2021&2022

- Revamped Courseworks on Vector Calculus, Automatic Differentiation and Optimization
- Aided in Lab sessions and managed marking

Data Structures & Algorithms *Teaching Assistant,* Imperial College Business School Fall 2021&2022

Aided in Lab sessions and co-created and ran weekly workshops designed to consolidate material

Computer Architecture, *Teaching Assistant,* Imperial College, Computing Fall 2021

Aided in Lab sessions and marked Coursework

Python for Non-CS Majors, *Course Leader*, UniCS Society Spring 2019

- Created **lecture materials and exercises** which were used in Python coding workshops
- Led weekly sessions, briefed TAs on the lesson plans, and lectured

Academic Service

- Reviewed for Journals: Artificial Intelligence, Conferences: UAI

Organization

- Organizing committee ICLP 2023 2022-23
- Co-organizer of **ICARL Seminar Series** and Reading Group 2021 - Present
- Co-organizer of **Imperial Computing Conference** 2020 - Present

Language Skills

English (Native) German (Native)