

RARES IORDAN

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EDUCATION

Master of Science in Machine Learning, University College London 2021 - 2022

Dissertation Title

On the Spectral Stability of Deep Reinforcement Learning Algorithms, supervised by
Prof. Marc Peter Deisenroth and Mihaela Rosca (Google Deepmind)

Distinction

Bachelor of Science in Physics, University College London

2018 - 2021

Dissertation Title

Jet Tagging in the Lund Plane with Graph Neural Networks and Transformers, supervised by
Prof. Mario Campanelli

1st Class

EXPERIENCE

TeesyTek, Zürich Startup

October 2023 - Present

Machine Learning Engineer

Remote

- Designed and implemented a robust end-to-end computer vision pipeline for autonomous golf robots, enhancing player interaction and system responsiveness.
- Developed high-performance, memory-efficient concurrent systems for the Rockchip 3588 SoC, optimizing processing speed and resource usage. In addition, I was tasked to read research papers and bridge theory and practice.
- Architected and deployed machine learning models on the cloud with AWS for scalable and reliable performance; Technologies used include AWS Lambda, SageMaker, S3, SQS and CloudFront.

University College London, Statistical Machine Learning Group

October 2022 - October 2023

Research Associate

London, UK

- Developed vGPMP, a novel Variational Inference algorithm for motion planning via pathwise conditioning, in TensorFlow and GFlow which brought open source contributions: using a conditioned GP prior, end-to-end simulation collision checking in TensorFlow for robot loaded through a URDF file (<https://github.com/luke-ck/vgmp>) and kernel derivatives with autodiff for GFlow.
- Oversaw all aspects of research, from designing experiments to testing and implementations of theoretical concepts and ran simulations in Bullet.
- Work culminated in a publication at the AISTATS 2024 conference which had an acceptance rate of 25%.
- Applied best software engineering practices to ensure robustness and maintainability of the codebase, including version control with Git, and code reviews.

University College London/CERN, ATLAS collaboration

June 2021 - September 2021

Research Intern

London, UK

- Led members of my team and developed new Graph Neural Network architectures which were deployed on the CERN LXPLUS Linux cluster for maximal throughput efficiency.
- Improved CERN performance benchmarks for particle identification, implemented gradient reversal layers and also published the findings internally.
- Technologies used include PyTorch, HTCondor, ROOT, C++

PUBLICATIONS

A Unifying Variational Framework for Gaussian Process Motion Planning [AISTATS 2024]

Lucas Cosier*, **Rares Iordan***, Sicelukwanda Zwane, Giovanni Franzese, James T Wilson, Marc Peter Deisenroth, Alexander Terenin, Yasemin Bekiroglu

* These authors had equal contribution.

Investigating the Edge of Stability Phenomenon in Reinforcement Learning [ICML workshop 2023]

Rares Iordan, Marc Peter Deisenroth, Mihaela Rosca

Tagging boosted W bosons applying machine learning to the Lund Jet Plane [CERN PUB Note]

The ATLAS Collaboration

PROJECTS

Active Meta Learning of Transformer Ensembles for Sentiment Analysis February - August 2022

- Applied boosting and random forest meta classifiers on features produced by BERTweet ensembles to overcome challenges posed by noisy labels produced by distant supervision
- Utilized uncertainty sampling techniques such as entropy sampling to actively learn on the highest entropy samples, improving the performance and efficiency of the machine learning model
- Achieved over 91% accuracy in binary tweet classification, ranking 7th out of 25 in the private Kaggle competition

Ultrasound Image Segmentation on the Mitral Valve February 2022 – June 2022

- Developed custom U-Net with squeeze-excite blocks and skip connections to segment the mitral valve
- Significantly increased accuracy (IoU coefficient) of the model by employing various image processing techniques such as inpainting and histogram equalization in conjunction with a deep denoiser network DRUnet, as well as using custom loss
- Scored top 10 in the private competition held as part of the Advanced Machine Learning course at ETH Zurich

EXTRA-CURRICULAR ACTIVITIES

Participant in regional Mathematics competitions in Romania and national Olympiads:

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| • Physics | 2017 |
| • Physics | 2016 |
| • Mathematics | 2015 |

SKILLS

Technical Skills	Python (NumPy, Matplotlib, TensorFlow, Keras, PyTorch, SciPy, Scikit-Learn, Seaborn, Pybullet, GPflow, NLTK, transformers), C++, Linux, git, SQL, HTCCondor, Blender, Microsoft Office Suite (Excel, PowerPoint, Word, Outlook, Access) AWS Lambda, SageMaker, S3, CloudFront, SQS
Language Skills	Romanian (Native), English (Bilingual), Chinese (Beginner)

REFERENCES

Marc Peter Deisenroth
Department of Computer Science
University College London
DeepMind Chair in Artificial Intelligence
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Mihaela Rosca
Staff Research Scientist
Google Deepmind
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