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 — 1^{st} *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 GPFlow 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/vgpmp) and kernel derivatives with autodiff for GPFlow.
- 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:

- 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, HTCondor, Blender, Microsoft Office Suite (Excel, PowerPoint, Word, Outlook, Access)
AWS Lambda, SageMaker, S3, CloudFront, SQS

Language Skills Romanian (Native), English (Bilingual), Chinese (Beginner)

REFERENCES

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University College London
DeepMind Chair in Artificial Intelligence
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Mihaela Rosca
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