FLORIAN JAECKLE

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SUMMARY

I am a final year PhD Student at the University of Oxford where I a member of the Optimization for Vision and Learning (OVAL) group in the Department of Engineering Science. The focus of my PhD lies on improving optimization algorithms with Machine Learning and Graph Neural Networks. In particular, I have worked on Neural Network Verification, Adversarial Attacks, and now Data Poisoning. I have published papers at AAAI, UAI, and ICLR. Moreover, I have recently worked on a medical paper published in the Clinical Research in Cardiology journal.

Prior to my PhD I completed my Bachelors and Master's in Mathematics and Computer Science at the University of Oxford where I finished top in the year, winning the Hoare prize and being awarded the Worcester College Scholarship.

EDUCATION

University of Oxford   *2017-Present*
PhD in **Machine Learning**, Optimization for Vision and Learning Group (OVAL)
Supervisor: Prof. M. Pawan Kumar
EPSRC Studentship for the Doctoral Training Centre in Autonomous Intelligent Machines and Systems (AIMS)

University of Oxford   *2013-2017*
MmathCompSci Masters in Mathematics and Computer Science
First Class Honours (80%)
Awarded **The Hoare Prize** for **best overall performance** in Mathematics & Computer Science
Worcester College Scholarship for "outstanding academic achievement and exceptional work"
My Master's thesis focused on complexity results in a single transferable voting system. In particular, it included various complexity results, such as NP-completeness proofs for various distance measurements.

EXPERIENCE

University of Oxford
PhD Researcher   2017 - Present
· Used **Graph Neutral Networks** to improve **Optimization** algorithms for **Computer Vision** problems
· Designed a novel optimization algorithm for **Neural Network Verification** that is 50 % faster than the state-of-the-art approach
· Proposed a new learnt optimization method that generates stronger **Adversarial Examples** more quickly, beating state-of-the-art methods by over 67%
· Came third in the 2nd International Verification of Neural Networks Competition (CAV 2021)

Graduate Teaching Assistant   2019 - Present
· Designed and taught the practical part of the optimization course for 30 first year PhD students
· The course includes an introduction to Python and Pytorch for machine learning and then focuses on smooth and non-smooth methods for regression, and scalable methods for classification

Supervising Master's Students   2020 - 2021
· Supervised and mentored an Engineering Master's Student, on their Master's dissertation
· Came up with a suitable project, and guided them through its completion

Oliver Wyman July - September 2016

Strategy Consultant Intern

- · Worked in a team of consultants providing a long term strategy for one of Germany's largest energy suppliers
- · Designed a complex Excel model, programming macros using VBA
- · Led and participated in many client meetings

Bettermarks (IT & Education start-up) September 2012

Software Engineering Intern

- · Wrote interactive maths programs in Python for year 10 students
- · Tested and debugged their website and their main program's user interface.

TECHNICAL STRENGTHS

Machine Learning	Python with Pytorch, CUDA, Numpy and Pandas
Statistical Analysis	Python with SciPy
Data Visualisation	Python with Matplotlib and Seaborn
Typesetting Document	Latex
Languages	German (native) and English (bilingual proficiency)

PUBLICATIONS

Florian Jaeckle, Dominik Peters, and Edith Elkind. On recognising nearly single-crossing preferences. In *Thirtsecond AAAI Conference on Artificial Intelligence*, 2018.

Florian Jaeckle and Pawan M. Kumar. Neural Lower Bounds for Verification. In *ICML Workshop on robust and reliable Machine Learning in the real world*, 2021.

Florian Jaeckle and Pawan M. Kumar. Generating Adversarial Examples with Graph Neural Networks. To appear in *Conference on Uncertainty in Artificial Intelligence*, 2021.

Florian Jaeckle, Jingyue Lu, and Pawan M. Kumar. Neural Network Branch-and-Bound for Neural Network Verification. Under review at *Journal of Machine Learning Research*.

REFEREES

Prof. M. Pawan Kumar, Department of Engineering, University of Oxford, pawan@robots.ox.ac.uk