

Lucas Cosier

Current affiliations: Computer Graphics Laboratory, Disney Research

Student at ETH Zürich

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Motivated candidate with a robust academic foundation in statistical machine learning and artificial intelligence. My background is related to computer vision, robotics and reinforcement learning, emphasizing efficient data learning and automated data collection. Actively seeking opportunities to apply expertise and advance the forefront of AI and machine learning.

EDUCATION

ETH Zürich

September 2021 – Present

Master of Computer Science MSc

- **Master Thesis at Disney Research: Reinforcement Learning for Video Compression**
- Completed research projects in robotics and deep reinforcement learning, utilizing skills and techniques such as sample complexity analysis, Bayesian inference, and optimization.

University College London

September 2018 – June 2021

Bachelor of Arts and Sciences BSc

- Top 10% of class, final weighted average 76%
- Relevant courses taken: Machine Learning, Deep Learning, NLP, Algorithms & Optimisation, Probability, Statistics, Multivariate Calculus, Quantitative & Numerical Methods, Linear Algebra, Real Analysis.

EXPERIENCE

Co-Founder & Machine Learning Engineer - TeesyTek

July 2023 – Present

- Research and develop high throughput, robust computer vision solutions that achieve 95% accuracy under time constraints (< 2s execution)
- Build high-performance, memory efficient, concurrent systems for Rockchip 3588 SoC
- Architect and deploy machine learning models on the cloud for scalable and reliable performance

Intern - ETH AI Center

November 2022 – April 2023

Supervised by Prof. Giorgia Ramponi

- Derived first sample complexity results for inverse reinforcement learning algorithms operating on continuous state-action spaces
- Employed Gaussian Processes to drive optimistic exploration under generative model of environment, which enabled tight error bounds on the recovered reward

Research Assistant - UCL

Aug 2019 – Jan 2020

Under Prof. Anahid Basiri

- Processed and visualized raw GNSS time series data, creating a Grafana dashboard for analysis. Conducted accurate data management.

PUBLICATIONS

[A Unified Framework for Gaussian Process Motion Planning](#)

AISTATS 2024

Supervisors: Prof. Marc P. Deisenroth, Dr. Yasemin Bekiroglu, and postdoc Alexander Terenin

- Initiated and carried out a machine learning research project to develop a versatile and robust Variational Gaussian Process-based framework for incorporating (any) motion planning constraints during end-to-end training. Our approach is the first to model uncertainty in the motion plan, making it more applicable to safety-critical applications, with success rates of over 90% overall.
- Led meetings, formulated, and implemented the proposed approach, published research findings, and released open-source code.
- Successfully managed a team of 8 researchers from Meta AI, UCL, and Cambridge, achieving project goals, including deploying the model on a real-world robot.

PROJECTS

Resource Allocation Controller

February 2023 – June 2023

- Analyzed batch job resource interference and scaling behavior
- Optimized Kubernetes scheduling policy on GCP to minimize SLO violations and runtime for Memcached server response time (target: 1ms)
- Implemented controller with dynamic resource allocation for collocating jobs under dynamic loads, achieving a 2.89% SLO violation ratio at 100K QPS

Active Meta Learning of Transformer Ensembles for Sentiment Analysis

February 2022 – August 2022

- Implemented boosting and random forest meta classifiers on BERTweet ensemble features to address noisy labels from distant supervision
- Applied uncertainty sampling, including entropy sampling, for active learning on high-entropy samples, enhancing model performance and efficiency
- Attained 91% accuracy in binary tweet classification, securing 7th place out of 25 participants in a private Kaggle competition

Fast Data Valuation Algorithm for computing the Shapley Value

February 2022 – June 2022

- Optimized Shapley value algorithm in C with SIMD intrinsics, BLAS, and advanced techniques like code motion reduction and blocking.
- Conducted profiling, validation, timing, benchmarking, cost, and bottleneck analysis using tools such as Intel Advisor and RTDSC instruction.
- Realized substantial performance improvement ($\sim 80\times$ faster) compared to the original Python-based implementation.

Ultrasound Image Segmentation on the Mitral Valve

December 2021 – February 2022

- Engineered a specialized U-Net featuring squeeze-excite blocks and skip connections for precise mitral valve segmentation.
- Enhanced model accuracy (IoU coefficient) through innovative image processing techniques, including inpainting, histogram equalization, and integration with the DRUnet deep denoiser network.
- Secured a top-10 position in the private competition as part of the course.

TECHNICAL SKILLS

(Programming) Languages: Python, C, C++, \LaTeX

Database Management: MySQL, PostgreSQL, MongoDB

Libraries: Tensorflow, PyTorch, GPflow, XGBoost, LightGBM, huggingface, transformers, ROS, OpenCV, PyBullet, NumPy, Pandas, Matplotlib, Ray, RLLib

Technologies: Git, Docker, Kubernetes, Kops, GCP, AWS Lambda, SageMaker, Grafana, Blender

LANGUAGES


Romanian (native), **English** (proficient), **German** (intermediate)

LEADERSHIP & INTERESTS

Was among 7 selected students for an industrial internship in software development (front- and back-end) in highschool. Founder of the UCL Mental Health Society, won multiple university as well as regional entrepreneurship competitions. Enthusiastic about classical music, won 2 distinctions in the regional “Johann Sebastian Bach” piano competition. The occasional amateur chess player, baker and skier.

REFERENCES

Prof. Marc P. Deisenroth
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