

Filip Skogh

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EDUCATION

- **ETH Zürich** *SEMP student; Master of Science - Computer Science* Zürich, Switzerland
Sep 2022 - Sep 2023
 - **Thesis:** Video Object Segmentation Without Mask Annotations
 - **Activities:** ETH Analytics Club*Courses: Natural Language Processing, Advanced Machine Learning, Computer Vision*
- **Chalmers University of Technology** *Master of Science - Data Science and AI* Gothenburg, Sweden
Aug 2021 - Jun 2022
 - **GPA:** 4.8/5.0
 - **Donationsstipendierna:** Scholarship for the “industrious and talented students at Chalmers”
- **Nanyang Technological University** *Exchange; Bachelor of Science - Computer Science* Singapore
Jan-Jun 2020
 - **GPA:** 5.0/5.0
 - **Thesis:** Spatiotemporal Fidelity of a Metapopulation Model Evaluated on the COVID-19 Pandemic in Sweden
 - **Teaching assistant:** Grading and helping students in object oriented programming*Courses: Digital Signal Processing, Cryptography, Operating Systems, Computer Networks, Software Engineering*
- **Luleå University of Technology** *Bachelor of Science - Computer Science* Sweden
Aug 2018 - Jun 2021
 - **GPA:** 5.0/5.0
 - **Thesis:** Spatiotemporal Fidelity of a Metapopulation Model Evaluated on the COVID-19 Pandemic in Sweden
 - **Teaching assistant:** Grading and helping students in object oriented programming

EXPERIENCE

- **Master Thesis Student** *Computer Vision Lab - ETH Zürich* Zürich, Switzerland
Feb 2023 - Sep 2023
 - **Objective:** Reduce the annotation burden for video object segmentation.
 - **Solution:** Implemented a loss function that utilize spatial and temporal information between video frames to derive a consistency based loss.
 - Demonstrated a 90% relative performance for the model trained with bounding boxes only to the oracle model trained in a fully-supervised way with complete masks.
- **Research Intern** *University of Massachusetts Amherst* MA, United States
Jun 2022 - Sep 2022
 - Developed a server load scheduler that route requests to data-centers such that carbon is minimized while satisfying latency constraint.
 - Turned vague idea into a formal optimization problem and then into a Python proof of concept.
 - Demonstrated a 30-70% reduction in total carbon spending in Europe and the US by simulating the scheduler with regional request data from Akamai and real carbon intensity data.
- **Security Analyst** *Orange Cyberdefense* Stockholm, Sweden
Jun 2019 - Aug 2021
(Every summer)
 - Built time series model for prediction and discovered a strong seasonal pattern in phishing attacks.
 - Developed automated threat response scripts that blocks ransomware, C&C servers and take snapshots for forensics. Those scripts were pushed world-wide on over 50.000 end points.
 - Crafted Splunk queries for real-time dashboards showing open SMB-servers, ssh connections, etc.
 - Developed scripts to periodically scan network using nmap and masscan.

PROJECTS

- **Exploring Transformers:** Implemented the Transformer-decoder in PyTorch with new techniques such as KV-cache for improved inference speed.
- **LLM fine-tuning and inference:** Fine-tuned the open-source LLM Falcon-40b using LoRA locally.
- **Blockchain implementation:** Implemented parts of the Bitcoin protocol from scratch to create, (i) a wallet address derived from an elliptic curve public key, (ii) a signed transaction which can be broadcasted to the network, and (iii) a block verifier.
- **Google Developer Student Club:** Learned how to build an interactive 3D learning game in Unity3D C# by building a hospital simulator. The project idea was conceived by medical professors prompted by the pandemic and was aimed to simulate medical students' practicum. During the project I worked in close contact with medical professionals and translated medical procedures into implementable scenarios in-game.
- **Game reverse engineering:** C++ project developed continuously for three years. Taught myself java internals, java native interface and reflection. Reverse engineered encryption protocols and ciphers to intercept traffic at packet level.
- **RANSAC:** Matlab implementation of RANSAC with optimal hypothesis testing that minimizes the number of tests performed. Project was motivated by the scarcity of available implementation and was based on the original white paper.
- **$n \times n$ Tic-Tac-Toe Player:** Created an unbeatable player by implementing the Monte Carlo Tree Search algorithm for efficient game-tree searching.

TECHNICAL SKILLS

- **Languages:** Python, C++, Java, C, Matlab
- **Frameworks:** PyTorch, Hugging Face, Map-Reduce, PySpark, OpenCV, Flask, Java Native Interface, MySQL
- **Miscellaneous:** Slurm, Debugging, Docker, Git, Regex