Matej Grcić

+385 95 8725563 | grcicmatej@gmail.com | LinkedIn | Scholar | GitHub | Personal page

Summary

- PhD degree in Machine Learning with strong publications record (NeurIPS, ICML, ECCV, IEEE PAMI) and coding skills in multiple programming languages
- Over 4 years of experience in research and development of solutions for industrial applications
- Fluent in English, experienced in leading interdisciplinary teams of scientists and engineers

Experience

Research Associate at CV Lab Sep. 2024 – Present

University of Zagreb, Faculty of Electrical Engineering and Computing *Zagreb, Croatia*

- Proposed a novel training strategy based on variational inference and optimal transport that blocks 99% of backdoor attacks on deep recognition models
- Adapted next token prediction from large language models for precise detection of hazardous behaviors in crowd surveillance systems
- Consulted data acquiring team that collected and annotated the largest academic road driving dataset for evaluation of semantic perception in the presence of unforeseen road hazards

Research Assistant at MLBio Lab Mar. 2023 – Sep. 2024.

École Polytechnique Fédérale de Lausanne (EPFL) *Lausanne, Switzerland*

- Developed a weakly-supervised machine learning method that discovers fine-grained classes within coarsely annotated data
- Proposed reinforcement learning strategy for de-novo discovery of cell types and gene programs, alleviating the need for human intervention
- Wrote a research proposal that secured 25 000 CHF grant for research in academic year 2023/24

Research Assistant at CV Lab Jul. 2020 – Mar. 2023.

University of Zagreb, Faculty of Electrical Engineering and Computing *Zagreb, Croatia*

- Enabled outlier-aware inference with standard semantic segmentation models at a cost of only 4% more computational overhead, allowing real-time deployment in autonomous driving
- Formulated the first hybrid anomaly score for pixel-level inference in real-time together with theoretical proof of performance gains
- Adapted generative models to produce synthetic negative data that emulate real-world anomalies in low-resource applications such as remote sensing
- Trained semantic segmentation models on all academic road-driving datasets using a novel semi-supervised training strategy, resulting in 10% improvement in segmentation of traffic scenes under adverse driving conditions (e.g. fog, night, rain, snow)
- Proposed stochastic skip connections that mitigate information bottleneck of standard normalizing flows, enabling 10% more accurate density estimation

Software Engineer Intern Jan. 2020 – Jun. 2020.

LifeNome Europe *Zagreb, Croatia*

- Designed and implemented a user-friendly interface around AI-powered solutions for personalized skincare
- Deployed a responsive web application for real-time human genome management
- Contributed to the development of new features for genome analysis in stateless microservices

Education

University of Zagreb, FER Sep. 2020 – Dec. 2024
PhD in Machine learning & Computer vision *Zagreb, Croatia*
Semantic segmentation, Anomaly detection, Out-of-distribution detection, Synthetic data, Generative models, Probabilistic modeling, Real-time inference, Backdoor attacks, Optimal transport

École Polytechnique Fédérale de Lausanne (EPFL) Mar. 2023 – Sep. 2024
Visiting PhD, EDIC school *Lausanne, Switzerland*
Machine Learning, Fine-grained class discovery, Weakly-supervised classification, Covex optimization

University of Zagreb, FER Oct. 2018 – Jul. 2020
MSc in Machine learning & Computer vision *Zagreb, Croatia*
Thesis: Dense out-of-distribution detection by using generative models

University of Zagreb, FER Oct. 2015 – Jul. 2018
BSc in Computing *Zagreb, Croatia*
Thesis: Neural architecture search with genetic evolution algorithms

Awards

Swiss Federal Government Excellence Scholarship AY. 2023/24
- Awarded in international competition (success rate 15-20%)

Winner of ACDC Challenge Jun. 2022
- Developed the best solution for semantic segmentation in adverse weather conditions
- Challenge at CVPR2022 Workshop Vision For All Seasons

Dean's Award for outstanding individual scientific research Jul. 2020
- Research on generative models conducted in the final semester of master studies

Other Relevant Experience

Reviewer for prestigious journals and conferences Jun. 2021 - Ongoing
- **Journals**: IEEE TPAMI, IEEE TNNLS, IEEE TIP
- **Conferences**: CVPR, ICCV, ECCV, NeurIPS, ICML, ICLR, AAAI, ACCV

Technical Skills

Languages: Python, Java, JavaScript, C
Frameworks/Libraries: Pytorch, Pytorch Lightning, Functorch, cuML, Scikit-learn, Matplotlib, Numpy, Pandas
Concepts: Agile research & development, Design Patterns, Clean code
Topics: Computer vision, Machine learning, Unsupervised learning, Weakly-supervised learning, Discrete optimization, Representation learning, Transfer learning, Anomaly detection, Out-of-distribution detection, Distributed training, multi-GPU training, Foundation models, Vision-language models, Optimal transport, Variational inference

Personal Info

Languages: English (fluent), Croatian (native)
Nationality: Croatian
Age: 28
License: B driving license