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, CVPR, ECCV, IEEE PAMI) and coding skills in multiple programming languages
- Over 4 years of experience in research and development of machine learning solutions for industrial applications
- Fluent in English, thrives in interdisciplinary teams of scientists, engineers and domain experts

Experience

Research Associate at CV Lab Sep. 2024 – Present

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

- Proposed supervised fine-tuning strategy for multimodal LLMs that blocks data poisoning backdoor attacks
- Proposed a novel training strategy based on variational inference, optimal transport and foundational models that blocks 99% of backdoor attacks on deep recognition models
- 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 and domain shifts
- Adapted next token prediction from large language models for real-time detection of hazardous human behaviors, enhancing the safety of surveilled public spaces

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*

- 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)
- Adapted generative models to produce synthetic data that emulates real-world anomalies. Training on the corresponding augmented dataset improved model robustness to anomalies in road-driving scenarios by 30%
- 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
- 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

Grants & Awards

Society of University Teachers and Other Scientists in Zagreb est. 1919. Feb. 2025
- Annual Award of the Society for Young Scientists and Artists for the AY. 2024

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