

Matej Jusup

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www.matej-jusup.com

HIGHLIGHTS

Co-developed the first LLM that plays chess at the world champion level at Google DeepMind.

Gemini Chess Gem: goo.gle/ChessChamp.

Designed a scalable probabilistic decision-making model for safe real-time multi-agent fleet control.

Demonstrated coordination of 10,000+ autonomous vehicles with sub-second planning latency.

PhD with 5 years of industry experience, including a leadership position.

Proven ability to drive innovative research from conception to deployment with expertise in AI, ML and Data Science.

Silver medalist at the Croatian junior (under 20 years) chess championship.

On www.chess.com 99.999th percentile among over 100 million registered users.

WORK EXPERIENCE

ETH Zurich

Doctoral Researcher

Zurich, Switzerland

Sep 2020 – Present

Key Contribution: Operating a fleet of tens of thousands of agents in real time while satisfying safety constraints.

THESIS: Safe and Scalable Ride-Sourcing Vehicle Rebalancing: A Constrained Mean-Field RL Approach

SUPERVISORS: Prof. Francesco Corman and Prof. Andreas Krause

RESEARCH AREA: Reinforcement Learning, Multi-Agent Systems, Sequential Decision Making, Data-Driven Algorithms

Google DeepMind — Gemini Post-Training Team

Student Researcher

Zurich, Switzerland

Apr 2024 – Sep 2024

Key Contribution: The first LLM that plays chess at the grandmaster level using human-comparable planning efficiency.

HOSTS: Eric Malmi and Aliaksei Severyn

PUBLICATION: First co-author of a spotlight paper at ICML 2025 — <https://arxiv.org/abs/2412.12119>

PLANNING WITH LLMs: Enhanced LLMs with search-based planning techniques to improve multi-step reasoning.

ASYNCHRONOUS MCTS: Introduced dynamic virtual counts to balance exploration–exploitation with few simulations.

PROMPT ENGINEERING: Assisted in designing board-game prompts and test-time internal search linearization.

TECHNOLOGY STACK: Python, Transformer Pre-Training, Supervised Fine-Tuning, Tree-Search Methods

Cantab Predictive Intelligence (tech startup)

Senior Machine Learning Researcher

Zagreb & Cambridge

Mar 2019 – Jul 2020

Key Contribution: Led a team of four researchers on a few projects running in parallel.

BEHAVIORAL CREDIT SCORING: Gradient-boosting model for default risk, achieving a market-leading Gini of 75%.

AI-DRIVEN MARKETING: Boosted heart drug sales by 10% via data-driven A/B-tested campaign for pharma client.

PERSONALIZED NEWSLETTER: Built a hybrid recommender (content-based + collaborative); 1.5% CTR in PoC.

DELIVERY DELAY ESTIMATION: Predicted COVID-era mail delays using ARIMA and supervised learning.

TECHNOLOGY STACK: Python, PyTorch, PySpark, Databricks, Statsmodels, AWS/Azure, Sklearn, Numpy, Pandas, Git

Morgan Stanley

Machine Learning Researcher

Budapest, Hungary

Oct 2017 – Feb 2019

Key Contribution: Built scalable models for risk, liquidity, and trade execution in financial systems.

SYSTEMIC RISK MODEL: Built a parallel hill climber heuristic, solving the problem in 3 minutes, averaging 5% from optimal.

CASH TRACEABILITY SYSTEM: Developed a real-time uncollateralized debt tracker from daily data feeds.

E-TRADING LIMITS CALIBRATION: Tuned model to block high-risk trades via statistical analysis of client behavior.

LISTED DERIVATIVES LIQUIDITY: Developed a PoC liquidation model driven by intraday futures data.

TECHNOLOGY STACK: Python, CPLEX, OR-Tools, Q/kdb+, PyQ, SQL, Pandas

Morgan Stanley

Software Engineer

New York, London & Budapest

Aug 2016 – Sep 2017

ANNUAL GRAD PROGRAM: Participated in a 15-week program for 50 globally selected students.

MARGIN CALCULATOR MICROSERVICE: Implemented and unit-tested features for NYSE and HKG stock exchanges.

TECHNOLOGY STACK: Java, C++, Spring Beans, JUnit

EDUCATION

PhD in Artificial Intelligence <i>ETH Zurich</i> SUPERVISORS: Prof. Francesco Corman and Prof. Andreas Krause	Zurich, Switzerland <i>Sep 2020 – Present</i>
MSc in Mathematical Statistics <i>University of Zagreb</i> SUPERVISOR: Prof. Marko Vrdoljak DISTINCTION: Graduated with honors.	Zagreb, Croatia <i>Oct 2013 – Feb 2017</i>
Visiting Student <i>University of Bielefeld</i> RESEARCH VISIT: Two semesters funded by Erasmus+ during which I wrote my MSc thesis. HOST: Prof. Andreas Dress	Bielefeld, Germany <i>Sep 2015 – Jul 2016</i>
BSc in Mathematics <i>University of Zagreb</i>	Zagreb, Croatia <i>Oct 2010 – Jul 2013</i>

SELECTED PUBLICATIONS

1. J. Schultz*, J. Adamek*, M. Jusup* et al. (2024), *Mastering Board Games by External and Internal Planning with Language Models*, ICML 2025 (* = equal contribution) — **spotlight**
2. M. Jusup et al. (2023), *Safe Model-Based Multi-Agent Mean-Field Reinforcement Learning*, AAMAS 2024 — **oral**
3. M. Jusup et al., *Scalable Ride-Sourcing Vehicle Rebalancing with Service Accessibility Guarantee: A Constrained Mean-Field Reinforcement Learning Approach*, arXiv preprint

SELECTED TALKS

CroAI (invited) <i>Superhuman Planning with LLMs — click for description</i>	Zagreb, Croatia <i>June 2025</i>
ZurichNLP (invited) <i>Mastering Board Games with Language Models — click for slides</i>	Zurich, Switzerland <i>Feb 2025</i>
Google DeepMind Booth at NeurIPS (invited) <i>Mastering Chess with Language Models</i>	Vancouver, Canada <i>Dec 2024</i>
AAMAS 2024 (conference) <i>Safe Model-Based Multi-Agent Mean-Field Reinforcement Learning</i>	Auckland, New Zealand <i>May 2024</i>
ETH Zurich AI Center (invited) <i>A Vehicle Repositioning Using a Safe Mean-Field Reinforcement Learning</i>	Zurich, Switzerland <i>Sep 2023</i>

PROGRAMMING SKILLS

Advanced: Python
Work Experience: PyTorch · PySpark · CLI · Q/kdb+ · C++
Minor Experience: TensorFlow · SQL · Java · C · R · Matlab
VCS & Cloud: Git · Databricks · AWS · Azure
Core Packages: Numpy · Sklearn · Pandas · SciPy · Statsmodels · CPLEX · OR-Tools · PyQ · Matplotlib · Plotly

LANGUAGES

English: Professional working proficiency	Croatian: Native speaker	German: Basic
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