

# Daniel Dratschuk

AI/ML Student

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🌐 [daniel-dratschuk.com](https://daniel-dratschuk.com) · 📍 Düsseldorf, Germany · [HuggingFace Profile](#)

## Research Interests

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Educational technology and human learning acceleration, deep learning architectures, reinforcement learning algorithms, and scalable machine learning infrastructure.

## Education

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### Master of Science in Mathematics

*Expected: August 2025*

*Heinrich-Heine-Universität*

Düsseldorf

Concentration: Reinforcement Learning, Statistics, Algebraic Topology

Relevant Coursework: Mathematical Statistics I+II, Applied Statistics, Probability Theory, Linear Algebra

**Thesis:** "Convergence Analysis of REINFORCE in Stochastic Policy Gradient Methods"

**GPA (expected):** 3.9 (US 4.0 scale) / 1.1 (German system)

### Bachelor of Science in Computer Science

*Expected: October 2025*

*Heinrich-Heine-Universität*

Düsseldorf

Concentration: Deep Learning, Machine Learning, Operating Systems

Relevant Coursework: Introduction to Deep Learning, Advanced Deep Learning, Machine Learning, Data Science, Software Engineering I+II+III

**GPA (expected):** 3.9 (US 4.0 scale) / 1.1 (German system)

## Technical Skills

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**Programming Languages:** Python, Java, Rust, C

**ML/DL Frameworks:** PyTorch, Hugging Face Transformers, scikit-learn

**RL Frameworks:** OpenAI Gym

**Research Tools:** Weights & Biases, TensorBoard, Jupyter, Matplotlib

**Systems & Tools:** Linux, Bash, Git, LaTeX

## Key Research Projects

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### Transformer-Based Kanji Reading Prediction for Japanese Text



*PyTorch, Weights & Biases*

Leveraged native-level Japanese linguistic knowledge to design a transformer-based sequence model for kanji reading prediction, incorporating deep understanding of Japanese morphology and phonetic systems.

**Impact:** Achieved state-of-the-art performance on this task, improving accuracy by X% over previous open-source models on a held-out test set.

## Open Source Contributions

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### Dictpopup



Developed a high-performance and low-memory popup dictionary application in C with GTK3 that operates on text selection and automatically generates Anki flashcards from queried words. Optimized Japanese word deinflection using a perfect hash set implementation, achieving superior performance compared to existing solutions.

### Bookminer



Developed an application in Rust that easily allows creating Anki flashcards from pdfs using Latex and automatically inserts source references.

## Honors & Awards

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- **Winner, Road to Start Hack 2025 in Munich** – Hackathon Competition (2024)

## Language Proficiency

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**Native:** German

**Fluent:** English, Japanese (JLPT N1)

**Advanced:** Russian