

ALEXANDRE KAISER

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EDUCATION

New York University – Courant Institute of Mathematical Sciences

NYC, NY

Master of Science in *Computer Science* (GPA: 3.9)

2022-2024

Thesis: *On Continual Learning using Deep Linear Networks* [pdf]

Northwestern University

Evanston, IL

Bachelor of Science in *Applied Mathematics*

2018-2022

Major Concentration in *Artificial Intelligence and Machine Learning* and Minor in *Economics*

Kellogg Certificate Program for Undergraduates, *Financial Economics*

EXPERIENCE

Researcher - NYU Courant, Arthur Jacot

June 2023 – June 2024

- Second authored paper titled *Hamiltonian Mechanics of Feature Learning: Bottleneck Structure in Leaky ResNets* that proves and characterizes the low dimensional bias of regularized neural networks [arXiv]

Data Science Consultant – Neuron7

June-Aug 2023

- Developed a codebase for rapidly prototyping RAG solutions on client data. By measuring the relative and mixed performance of a wide array of natural language search algorithms from traditional NLP techniques (semantic search) and modern embedding methods (SBERT, E5), the codebase improved search accuracy by up to 20% when retrieving relevant documents from proprietary client records.
- Led quality check for real client search results to verify the labelling accuracy of our training datasets

Assistant Modeling Engineer - Prophesee

June-Aug 2022

- Developed a model to replicate the experimental noise profile of the company's proprietary vision system. Along with making it an interactive tool, the hardware teams were able to optimize various component parameters, leading to an accelerated R&D schedule
- Analyzed the impact of signal noise on the product error rate across 100+ different test conditions, influencing the direction of future research by the product team.
- Completed thorough 45page documentation for continued use by the team once the internship had ended

Software Engineer - T4G Limited

June-Sept 2019

- Managed Microsoft Azure cloud resources, and manipulated SQL databases to implement data solutions for clients
- Developed a *Unity* game object using *Virtual Reality*, including 500+ lines of code; presented a 14-page report

Algorithms Graduate Tutor - NYU Courant, Ernest Davis

Sept-Dec 2023

- Personalized instruction to enhance master's students' understanding of advanced algorithmic concepts
- Facilitated critical thinking and problem solving by framing the algorithmic decision within specific problems

Instructor/Counselor - Future Stars

July-Aug 2021

- Selected, designed and led 14 sports-related activities, adapted to the camper's changing needs and the Covid situation
- Motivated and inspired groups of adolescents for eight-hours a day with the approach of leading with positivity

KEY PROJECTS

Text2RelationalGraph [Github]

Dec 2023

- Created a webapp to convert long-form texts into hierarchical relational graphs, for use in summarization and search

Large Language & Vision Model Seminar

Sept – Dec 2023

- Analyzed cutting-edge research in Foundation Models and presented lectures on Llama 2 [slides|paper], Imagen Video [slides|paper], DINOv2 [slides|paper] and high resolution image synthesis [slides|paper]

Discretization gives Uniformity: Surveying a Universal Algorithm for OCO [pdf]

May 2024

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Survey of Online Learning and Approachability Theory [pdf]

May 2023

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Adam Limitation Study [pdf]

May 2024

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Seminar Research and Presentation

Sept - Dec 2023

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CORE SKILLS

Programming: Python, MATLAB, C++, SQL, LLM Prompt Engineering, RAG, PyTorch, HuggingFace

Mathematics: Perfect 800 SAT Math and 170 GRE Quantitative, 1st place Math Olympiad, Créteil, France, 2017

Spoken languages: English (native), French (native), Spanish (basic)