# John Doe

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## EDUCATION

**School** August 2020 - June 2025
*Master of Science in Engineering, Something* *City, Country*

- Specialization in Image Analysis and Machine Intelligence.
- Grades: 4.74/5.00.

**Seconf School** February 2024 - August 2024
*Exchange Studies* *City, Country*

- Courses in: Advanced Probability Theory, Computer Vision, Modern NLP, Reinforcement Learning.
- Grades: 4.74/5.00.

## EXPERIENCE

**Company** August 2022 - Present
*Student Test Engineer (Part-Time)* *City, Country*

- Conducted comprehensive **testing** of network speaker firmware and software, pinpointing critical defects and verifying new features.
- Utilized **PuTTY**, **Wireshark**, and **Postman** to inspect logs, analyze network traffic, and **debug complex issues** in real time.
- Created and managed bug reports in **Jira**, collaborating closely with developers to expedite critical fixes.
- Contributed to **test automation** efforts in **Python** for Windows-based applications, for regression testing.
- Developed productive relationships with **developers** and **product managers** to streamline testing processes.
- **Mentored** new testers by sharing best practices, troubleshooting methodologies, and QA strategies to maintain high software quality.

## PROJECTS

**Bird Song Classification Using Spectral Analysis and CNNs**

- Led a machine learning project to classify bird species from audio recordings, **achieving a 96.31% accuracy** in identifying three common bird species using advanced AI techniques.
- **Automated** data acquisition by **developing a Python script** that interfaced with the Xeno-canto **API**, streamlining the retrieval of extensive bird audio datasets.
- Implemented **signal processing** and spectral analysis in **MATLAB** to generate high-quality spectrograms and **developed an algorithm** for automated syllable detection, enhancing data quality and processing efficiency.
- Enhanced spectrogram data reliability by **applying image processing, data augmentation, and feature extraction** techniques in **Python**, optimizing inputs for convolutional neural network training.
- Designed and optimized multiple convolutional neural network (**CNN**) architectures using the **Keras library** in **Python refining models** to accurately classify spectrograms and selecting the best-performing model.

**EPFLLaMA: A Lightweight LLM Finetuned on EPFL Curriculum**

- Led development of EPFLLaMA, a specialized language model for STEM education.
- Managed the entire dataset creation process, including data scraping, cleaning, and annotation.
- Implemented advanced fine-tuning techniques including Supervised Fine-Tuning (**SFT**) and Direct Preference Optimization (**DPO**) to enhance model performance and reduce bias.
- Applied Parameter-Efficient Fine-Tuning (**PEFT**) methods, specifically Low-Rank Adaptation (**LoRA**).
- Developed a specialized model for Multiple-Choice Question Answering, improving accuracy by 100% compared to baseline models in STEM-related tasks.
- Implemented **quantization** techniques, reducing model size by 50% while maintaining performance, demonstrating skills in model optimization for practical applications.

- Leveraged **Python** and **PyTorch** along with specialized libraries like **Transformers**, **TRL**, and **Unsloth** for model development, training, and optimization.

**Parallel n-step Advantage Actor-Critic**

- Implemented a scalable Advantage Actor-Critic (A2C) algorithm using **PyTorch**, achieving optimal policy convergence for both discrete and continuous control tasks.
- Engineered **parallel training** architecture with multiple workers and n-step returns, resulting in **4x faster training** through innovative **batch processing**.
- Developed sophisticated reward handling with stochastic rewards and **reinforcement learning** advantage estimation, demonstrating deep understanding of RL foundations.
- Built comprehensive visualization pipelines using **Matplotlib** and **Gymnasium** to track value functions and enable data-driven hyperparameter optimization.
- Achieved 100% success rate in CartPole while reducing training time from minutes to seconds through effective **parallelization**.

## SKILLS

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|---|---|
| **Programming languages** | Java, MATLAB, Python, MySQL, C |
| **Machine Learning** | PyTorch, Keras, Transformers, TRL, Unsloth, NumPy, SciPy |
| **Version Control** | Git |
| **Languages** | Swedish, English, Arabic |