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Experience

- **Center of Advanced Mathematical Sciences (CAMS, AUB)** — Beirut, Lebanon
  Research Assistant — *May 2025 - Present*
  - **Large Percussion Model (LPM)**: Engineering a specialized LLM designed to autonomously perform Derbouka music. Engineered the core infrastructure and designed custom tokenization strategies .
  - **Algorithmic Design**: Developed and implemented complex rhythmic algorithms to ensure micro-timing accuracy and "human-like" swing. Managed the entire deployment pipeline and model optimization for real-time performance.
- **American University of Beirut** — Beirut, Lebanon
  Teaching Assistant — *Jan 2025 - Dec 2025*
  - **Intro to Computation (Python)**: Facilitated lab sessions, teaching fundamental programming concepts and algorithmic thinking in Python.
  - **Data Structures (C++)**: Provided technical guidance on memory management, complexity analysis, and the implementation of efficient data structures like trees, graphs, and hash tables.
- **GSC S.A.R.L.** — Remote
  Fullstack Engineering Internship — *Nov 2022 - Feb 2023*
  - **Expense Management System**: Architected a web-based, projects-divided dashboard for tracking business expenditures, integrating a React frontend with a Node.js backend to handle real-time data updates.
  - **Security & Auth**: Implemented secure user authentication workflows using JWT and BCrypt, ensuring data privacy and role-based access control across the platform.

Projects and Research

- **Derbake Synthesis & Data Gen Platform**: Built a full-stack platform for generating synthetic percussion datasets. Features a granular control panel for rhythmic settings (tempo, ornamentations, time signatures) that interfaces with a backend engine to generate procedural music.
- **Custom File Format**: Designed and implemented a proprietary `.derbake` file format for efficient storage of rhythmic metadata. Developed an automated pipeline to stream and archive generated outputs directly to AWS S3 buckets for model training readiness.
- **Quanbench Plus**: A benchmarking suite for quantum algorithms developed accross Pennylane, Qiskit and Cirq, evaluating performance metrics across different Large Language Models.
- **Multimedia Interactive RAG System**: Designed a graph based Retrieval-Augmented Generation system that processes and queries multimodal data (text and video) uploaded by the user for highly contextual AI responses.
- **AUBus**: Designed an application layer protocol to optimize campus transit, featuring real-time driver and rider matching using Google maps API
- **Additional Projects**: A lot of miscellaneous projects including but not limited to: Neural Network from scratch, a cross-platform file manager using Electron, a lightweight api gateway and a VPN blocker. Check these projects (and many more) on my github profile: https://github.com/maxovicsteiner

Extracurriculars

- **ACM AI Technical Officer**: Organizing technical workshops and coding competitions focused on Artificial Intelligence; managing technical infrastructure for chapter events.
- **Scout Leader**: Leading youth groups in team-building exercises and community service projects, fostering leadership, discipline, and effective communication skills.

Technical skills

- **Web**: HTML, CSS, Javascript, Electron, React, Node.js, Typescript, Flask, PostgreSQL, MongoDB, Linux, Docker, AWS, Kubernetes
- **AI & ML**: Python, PyTorch, LLMs, RAG
- **Quantum computation**: Pennylane, Quantum Circuit Design
- **Programming languages**: Python, C++, Javascript, SQL, Java, Bash

Education

- **American University of Beirut (AUB)** — Beirut, Lebanon
  B.E. in Computer Science & Engineering — *August. 2024 – June. 2028*
  - **Relevant courses**: Design and Analysis of Algorithms, Theory of computation, LLMs and RAG systems, Quantum computing