

# ROBERT ORLIKOWSKI

SOFTWARE ENGINEER

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## TECHNICAL SKILLS

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**Programming** C, C++, Python, Ocaml, Go, SQL  
**Tools** Git, GitHub, GDB, VSCode

## PROJECTS

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**Xi Compiler** | Ocaml, Dune, Ocamllex, Menhir

- Lexer and parser in ocamllex and menhir.
- Bidirectional typechecker.
- Code generator translating AST into intermediate low level language.
- Register allocation algorithm that allow language to be executed on real architecture with finite amount of registers.
- Live variable analysis optimization.

**Deep learning framework** | Python, Numpy

- Cpu only deep learning framework using numpy as backend.
- Functionalities: Autograd on N-dimensional Matrices, SGD with momentum and Adam optimizers, Dataloader, Custom weight initialization.

**Raft Consensus Algorithm** | Go

- Distributed consensus algorithm.
- Replicated state machine, Leader election, Log replication.

**Diffusion model for image denoising** | Python, Pytorch

- Written as 3 person, team project for deep learnign course.
- Implemented sampling algorithm based on sciencific papers, Trained model on google cloud using TPU's

**Elements of database managment system** | C++, Cmake, GoogleTest

- Implemented important parts of database managment systems in C++ as part of database implementation course.
- Buffer pool manager, Bplus tree indexing with fine grained concurrency, Lock Manager, Cycle detection, Executors for inserting, updating and deleting tuples.

**Other projects** | C, Renode, Buildroot, C++, OpenMp

- Simple unix shell, Linked-list based Malloc, Traceroute, Reliable client-server communication over UDP, linux device drivers, Map-reduce algorithm, Webserver serving static files in pure c, N-Body simulator using quadtree and OpenMP, Kernel threads library, lottery scheduler and copy on write memory in xv6 kernel.

## EDUCATION

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### Degree

- 2019-2020 University of Warsaw, works toward BS in Computer Science.
- 2020-2024 University of Wroclaw, BS joint individual studies in Mathematis and Computer Science.

### Mathematics

 Key courses:

- Real Analysis I,II,III, Probability ,Stochastic modeling, Numerical Analysis, Advanced differential equations 1, Abstract Algebra, Advanced linear algebra 1, linear algebra 2, Discrete Mathematics, Logic for informatics

### Computer Science

 Key courses:

- Compilers Construction, Operating Systems ,Computer Architecture, Programming Drivers for Linux ,Computer Networks, Neural Networks and Natural Language Processing, Machine Learning, Databases, Algorithms and data strutures, Programming methodologies

## ABOUT ME

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I'm a math and computer science student at the University of Wroclaw. I'm interested in machine learning, databases, applied math, and system programming. In my free time, I enjoy playing sports, digging into open-source projects, learning about history, watching anime and old movies.