Jakub Arnold

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Location: Prague, Czech Republic

PROFESSIONAL EXPERIENCE

- **Brave Software** Rust, Python
  Search Engineer *August 2023 - February 2024*
  - Worked on increasing index coverage & improving search result quality.
  - Developed a new service for large scale processing of RSS feeds.
  - Optimized code for high performance and parallelism.

- **LogLog Games** Rust (wgpu), Lua, Unity (C#), Godot, Unreal Engine
  Independent Game Developer *January 2022 – Present*
  - Developed and published several games on Steam using Rust, Unity, Godot, and Unreal Engine 4.
  - Created a custom 2D game engine in Rust utilizing wgpu for graphics programming, including modern lighting and post processing effects, particle systems, batching, etc.
  - Managed the entire game development pipeline, from initial concept to final release, including design, programming, CI deployment, art, audio, and marketing.
  - Actively engaged with the game development community, staying up-to-date with industry trends, and continuously refining technical skills.

- **Wikifactory** Golang, C++, JavaScript
  Senior Full Stack Engineer *July 2020 - April 2021*
  - Processed 3D CAD data in Golang/C++ for visualization in a custom 3D viewer using WebAssembly, with communication via GraphQL subscriptions and glTF.
  - Implemented a change tracking framework for MobX with custom observables, used to automatically synchronize state between JavaScript/React and C++/WebAssembly.

- **Institute of Formal and Applied Linguistics – Prague, Czech Republic** Python, Tensorflow, C++
  Software Engineer (part-time) *April 2019 – December 2021*
  - Implemented bayesian optimization for hyperparameter tuning using Python, providing better than manual expert baseline, and created novel visualizations of higly-dimensional data.
  - Created a C++ interface for TensorFlow C API to enable 5+ year old applications to load new models.

- **Merck Sharp & Dohme Corp. – Prague, Czech Republic** Python (Flask), JavaScript (React)
  Machine Learning Engineer *July 2018 – March 2019*
  - Researched and implemented custom high performance algorithms for solving combinatorial problems in DNA processing, resulting in over a 1000x speedup (from hours to seconds on larger datasets).
  - Automated deployment processes with Docker and AWS.
  - Fixed complex bugs in a result visualization application written in d3.js and React.
  - Researched the use of differential privacy with deep learning for generating synthetic datasets from highly sensitive data, and deployed a dockerized prototype with Generative Adversarial Networks (GANs).

- **Freelance – Remote** JavaScript (React), Node.js, Ruby on Rails, Haskell, Go, C#
  Full Stack Software Engineer *March 2015 – June 2018*
  - Architected a major refactoring using modern OOP practices in a large scale ad managemenet system handling over $80 million worth of Google AdWords campaigns, resulting in dramatic increase in maintainability, testability and performance
  - Led development of a drug administration system in React, Redux (Redux-Form) and Ruby on Rails.
  - Developed an award winning iOS/Android (Xamarin C#) application for a T-Mobile startup incubator, in just under three months.
  - Architected and created optimized APIs in Ruby on Rails and Node.js for multilingual classified sites used by millions of unique visitors daily (including RTL languages).

- ○ Built a realtime Node.js backend (using Socket.io) for mobile application to help visually impaired people navigate in a foreign city.

- **sensible.io – Remote**   JavaScript (Ember.js), Ruby on Rails, Go, Node.js
  Full Stack Software Engineer   *November 2012 – February 2015*
  - ○ Created a real-time single page application for doctor appointments using Ember.js and PubNub.
  - ○ Deployed multiple applications to DigitalOcean & AWS and maintained the production environment.
  - ○ Maintained enterprise-level OAuth2 server with complex business logic written in Node.js.
  - ○ Developed a complex single page application with multi-step form wizards for banner ad management using Ember.js.

- **Mineus s.r.o. – Prague, Czech Republic**   Ruby on Rails, JavaScript (Backbone)
  Full Stack Software Engineer   *December 2011 – October 2012*
  - ○ Designed JavaScript SVG visualizations for log data in Raphael.js and Backbone.
  - ○ Built an indexing service for gigabytes daily analytical data using ElasticSearch and PostgreSQL.
  - ○ Interviewed 10+ new developers during the hiring process.

Programming Skills

- **Programming Languages**: Rust, C#, Go, C++, JavaScript, Lua, Python, Clojure, Ruby, Haskell, Bash

- **Frontend**: React, Redux, MobX, Ember.js, Rx.js, TypeScript, Webpack, Backbone, HTML5 Canvas

- **Backend**: Node.js, Ruby on Rails, PostgreSQL, GraphQL, ElasticSearch, SQL, WebSockets, Linux, AWS, Docker, Braintree, Redis

Education

- **Master's Degree in Computer Science**   Charles University – Prague, Czech Republic

  - ○ Machine Learning, Deep Learning, Evolutionary Algorithms, NLP, Parallel Programming
  - ○ Master's Thesis: "Bayesian Optimization of Hyperparameters Using Gaussian Processes"
    - ∗ Implemented a practical tool for optimizing neural network hyperparameters using Bayesian optimization, with a focus on Gaussian Process regression.
    - ∗ Evaluated performance through real-world experiments, demonstrating improvements in loss values, reduced variance, and better performance compared to manually designed hyperparameters.
    - ∗ Explored the utility of Gaussian Process regression for visualizing hyperparameter relationships.

Large Personal Projects

- **Trackets – Remote**   JavaScript, Ruby on Rails, Node.js
  Co-Founder & Full Stack Software Engineer   *2013 – 2015 (discontinued)*
  - ○ Launched a subscription based JavaScript error tracking service (similar to Sentry or Bugsnag) with paying customers.
  - ○ Designed a highly optimized embeddable JavaScript snippet for capturing stack-traces on client websites using Google Closure Compiler (8kB minified with cross browser support for stack-trace extraction).

- **SCV Rush – Remote**   Ruby on Rails, JavaScript, Node.js
  Co-Founder & Full Stack Software Engineer   *2011 - 2014 (discontinued)*
  - ○ Founded and ran a StarCraft 2 tournament website which eventually grew to 40 person staff for organizing and managing tournaments.
  - ○ Built a complex Ruby on Rails application with custom tournament bracket algorithm, including a frontend bracket renderer, and a single page application in Ember.js
  - ○ Managed community developers and designers who wanted to contribute to the project.
  - ○ Implemented and deployed a live chat application that supported thousands of concurrent users using Node.js and Socket.io.