

# Jakub Arnold

jakuba.net | blog.jakuba.net

linkedin.com/in/jakubarnold | github.com/darthdeus

Email: jakub.arnold@proton.me

Location: Prague, Czech Republic

## PROFESSIONAL EXPERIENCE

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- **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 highly-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 management 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**

*Full Stack Software Engineer*

Ruby on Rails, JavaScript (Backbone)

*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

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- **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

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- **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

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- **Trackets – Remote**

*Co-Founder & Full Stack Software Engineer*

JavaScript, Ruby on Rails, Node.js

*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**

*Co-Founder & Full Stack Software Engineer*

Ruby on Rails, JavaScript, Node.js

*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.