

# Martin Josefsson - Freelance Programmer

## Profile

Since childhood I have been programming computers. In my free time I work on type systems & compilers. Lot of experience simplifying complex problems with data, web backends and frontends, languages, and protocols, focusing on breaking complex problems up into small, pure and non-dependent parts with simple interfaces. When not memory-constrained, I often program with immutable data and types/invariants ensuring correctness. Having worked around Europe I've learned how to get up to speed with a new code base and team quickly, and I am confident in collaborating in English, German, Danish, Norwegian, and Swedish, and in the programming languages Typescript/Javascript, OCaml, Clojure, Java, Ruby, Python, C, Lisp, Prolog, and more.

Below follows a history of my freelance projects.

## Toneheim Music school, Malung folkhögskola Music school 2020 - 2022

Studies in Nordic folk music and dance on the fiddle. Not code related, but music theory and computer science have more in common than you'd think. . .

## Skatteministeriet, Copenhagen, DK, 2019-2020

#clojure #postgres #postgis

March 2019 - August 2020

For the Danish Tax Agency I and my team implemented **bitemporal geodata tables** for *PostgreSQL+PostGIS*, meaning a GIS database where you can query not only the current state, but also “time travel” back to previous states, and also query the database for “what did we know at time X”. This in order to accurately asses property values and to query the state of the country back in time. The basic technique is to format your tables as a sequence of **facts**, where each **fact** contains a timestamp for when we learned it, and another timestamp for from when it was valid from. We then created a Clojure program to query this sequence of facts, as if we had travelled to time T, and only using facts that were valid between a range (usually January - December that year).

## Compiler Creation - Purely functional HM type system language with a twist

#ocaml

I took 2018 off as a sabbatical, to study interpreter & compiler writing, and type systems. It has been extremely fun, and I've learned so much! Have implemented functional programming languages, abstract type systems, and different styles of interpretation and compilation. These have been written in **Haskell**, **OCaml**, **Rust**, **Javascript/Typescript**, **Racket**, and **Clojure**. Update as of 6 Oct 2021: the code for my main compiler project is up on <https://www.github.com/fromheten/plato-2020-ocaml>.

## **Brickblock, Berlin, DE, 2017**

#solidity #ethereum #javascript

October 2017 - End of December 2017

Brickblock were finishing their ICO (fundraising by minting and selling a blockchain currency, aka “token”). I helped them with writing the software to collect information about their investors, by analysing public data on blockchains and writing programs to compile this information into scheduled payouts of the token they created to reward investors. This was done using Clojure and Node.js. Also wrote Node.js web API that would receive Bitcoin and Litecoin signatures (they’re public-private-key encryption systems) and store these away in a MySQL database. We used Google Cloud.

## **SearchMetrics GmbH, Berlin, DE, 2017**

#javascript #react #graphql

August 2017 - November 2017

For SearchMetrics GmbH in Berlin I was hired to upgrade and modernise their flagship application with the (then) latest tech *GraphQL* and *React.js*.

## **Juxt Inc, London, UK, 2016**

#clojure #lisp #redis #elasticsearch

October 2016 - January 2017

Together with the Juxt team in London, I refactored the main back end of their clients. The client is one of the UKs biggest news and media companies. The task was specifically to make the code less imperative and more *purely functional*, to deal with problems with blocking code and latency.

My team wrote the backend with mainly Clojure, Redis, ElasticSearch. Heavy use of pure functional programming.

## **Clubhouse Inc, London, UK, 2016**

#clojure #clojurescript

August & September 2016

Clubhouse in London had Tetley Tea as a customer, and for their advertising campaign we created a web app, where we would show the user funny videos, and run a program that detected their reaction via the webcam (with their permission). Every time we detected a smile, we would increment a counter. After we had one million smiles, Tetley would donate \$1 million to charity.

The whole program was written in Clojure and Clojurescript, and used Firebase for storage.

## **Founder, Momona, Berlin, DE, 2016**

#bitcoin #javascript

February 2016 - June 2016

Me and a friend made a pay-per-view service for the web, where payments were made with Bitcoin.

When a user wanted to see some content, they were first presented with a freshly generated bitcoin address. When that address had the required amount sent to it, the link would no longer present a payment request page, but instead show the user the actual content.

The idea was that website owners would be able to embed links that required payment to view.

It was a good idea, and it works, but during the time we developed it, the price of a Bitcoin transaction grew a lot, and it was no longer viable to do micropayments on the blockchain.

You can read the code for the backend here: <https://github.com/EndlessVanguard/bitcoin-remunerate-api>

The code that was embedded on the users pages: <https://github.com/EndlessVanguard/bitcoin-remunerate-web>

## **eBay, Berlin, DE, 2014-2016**

#java #javascript #react #functionalprogramming

December 2014 - March 2016

At eBay/mobile.de I wrote React.js for their car sales platform, enjoying a diverse set of tasks from architectural to implementing new features. I was leading the client-side effort, creating an app with technologies such as React, Webpack and programming all in a functional style.

## **Axel Springer, Berlin, DE, 2014-2015**

#javascript #angular

October 2014 - December 2014

Axel Springers Labs department wanted an internal tool for searching their vast (!) archives, and I was part of the small team assembled to develop the product iPool. One of the most fun projects ever! The app was written in Java with a Javascript front end, and ElasticSearch backend.

## **Remote Bitcoin Jobs, Berlin, DE, 2014**

April 2014 - September 2014

I created a website where people could upload ads and apply for remote jobs in the bitcoin/blockchain sector back in 2014. Personal side project.

## **Bonagora GmbH, Berlin, DE, 2014 (Remote)**

#javascript #react #java

January 2014 - May 2014

I was contracting with Bonagora to help create their MVP to launch. It was a B2B platform for buyers and sellers of industrial material around the world. Sadly the company doesn't exist anymore. My task was implementing the app in Javascript.

## **Gosub GmbH, Berlin, DE, 2013**

#javascript #canvasjs

October 2013 - December 2013

Gosub was making a game for the public broadcaster ZDFs show "Die Pilgerin". In the last few months before launch I was hired to the team to help finish the development. We used Angular.js for state management, and CanvasJS to render the game.

## **Urlist, Berlin, DE, 2013**

#python #backbonejs #javascript

June 2013 - Sept 2013

Urlist was a Berliner Startup where you would collect links and share them. It was popular with teachers! I was hired on the job to help writing Javascript with Backbone.js.

<https://nitter.net/urlist>

## **Pickled Olives Software, Berlin, DE 2012-2013**

#ruby #rubyonrails

Wrote Ruby on Rails 3 for a online web-shop creation software, similar to Shopify, but for the German market.