MATEI ADRIEL RAFAEL

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PERSONAL PROJECTS

Lunarbox

Lunarbox is a **strongly-typed visual functional programming langauge** I made in Purescript. It features an interactive editor, type inference, a basic linter & optimizer, a color-encoding of types, cloud sync, an admin interface and an example & tutorial system.

Lunarflow

LunarFlow is a **lambda calculus visualizer** written in PureScript using concur and algebraic effects via free monads. During it's development I researched and implemented multiple tree transformation algorithms based on recursion schemes, including a size annotator, shape-preserving (eta) reduction and a layout generation algorithm.

Logic gate simulator

During the summer of 2019 I developed a web editor and simulator for logic gates using **TypeScript** with **react** and **rxjs**. The simulator featured an extensive interactive editor (drag and drop, selections, clipboard operations, etc), integrated circuits (custom components encapsulating a piece of logic), up to 32 bits per pin, support for multiple languages and locales, and configurable components which enables extensibility from the user.

Doffycup

Doffycup is a **interactive programming teaching tool** me and a friend developed in the final round of the infoeducatie contest. The project combines a live-updating, scratch-like, read-only code interface with a cup guessing game in order to create an unique experience that has been tested on a number of kids with great success.

Lunarlog & moonlog

Moonlog is a simple implementation of an indentation-based logic programming langauge using PureScript. During the summer of 2021, I went a step further and created Lunarlog — a **visual logic based programming language** implemented using a handmade purescript graphics library.

Type system implementations

I have spent a significant amount of times learning about the implementation of type systems for programming languages. I have implemented various such systems, ranging from Hindley–Milner type inference, rank-n types, up to basic dependently typed systems with implicit arguments.

WORK EXPERIENCE

Wargame arena

Spring of 2022

As a **Purescipt** freelancer, I worked on the development of an interactive ui for a wargame playing platform. I solved tasks ranging from bringing mockup UIs to reality using **Halogen** and **CSS**, to implementing Firebase-based authentication and interacting with a server using websockets.

Visonum

Summer of 2022 – present

As a **Purescript** software engineer, I worked on multiple projects related to network quality testing. I learnt a lot about writing quality unit tests, processing streams of data and integrating PureScript into existing Javascript codebases.

EDUCATION

Math and Computer Science

September 2018 – June 2022

Stefan Demetrescu high school

BSC Mathematics

September 2022 – present

University of Groningen

SKILLS

PROEFICIENT	Purescript – TypeScript – NodeJs – Neovim
INTERMEDIATE	Elm – Nix – Haskell – Python – Lua
BEGINNER	Rust – F# – Lean – Idris

ACTIVITIES

Infoeducatie

Infoeducatie is a country-wide programming contest in Romania. The contestants create a project they present to a group of judges across multiple phases. The top 5 contestants across a list of predefined categories get to compete in a 24h hackaton. I have competed and **won second place 3 years in a row**.