Srijan Paul

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Experience

DeepSource (YC W20) – Sofware Engineer 2 Oct. 2021 – Present
Compiler tooling – Golang, gRPC, Bun+SQLite, PureScript, TypeScript, SolidJS, Docker *Bangalore, India*

- Built the JavaScript static analyzer — serving **100k+ monthly analysis runs**.
- Improved the average program analysis runtime by **13.5x** (9 mins to 40s).
- Developed a custom IR format, **compiler tooling** and a **data flow analysis engine** for JS/TS.
- Wrote the gRPC service that connects the user's IDE to the DeepSource cloud.
- Built a fast, configurable, AST-based duplicate code detector.
- Led the development for DeepSource IDE plugin: runs static analyzers locally.
- Built Autofix AI – fix issues in code using tree-sitter and LLMs.
- Wrote services for efficient scheduling, metrics collection, and tracing.

Tezos – Student software developer Aug. 2021 – Oct. 2021
Haskell, SmartPy, TypeScript, Node, React, Genetic Algorithms *Tezos Fellowship (Remote)*

- Authored a michelson **bytecode verification library** in Haskell.
- Implemented the genetic algorithm to breed and backtrace ancestry of virtual pets.
- Built a **procedural generation engine** — generates 46 million distinct virtual pets with avatars.

Google Summer of Code - LabLua May 2021 – Aug. 2021
Compiler engineering: Lua, C, . (View Project) *PUC-Rio, Brazil (Remote)*

- Implemented higher order functions and closures in the Pallene compiler.
- Added support for upvalues and lexical capturing.

Open Source Work

The Pallene Project
C, Lua

- Optimized ipairs based loops by lowering to faster IR – upto **66% faster** on benchmarks.
- Implemented **compiler optimizations** like constant propagation and constant folding.

Kiesel JavaScript engine
Zig, JS runtime development

- Implemented several bug-fixes, added unicode support in the parser.
- Built the world's fastest unicode property detector using bitpacked tries.

Zig Language Server
Zig

- Fixed several bugs with type resolution, symbol renaming, etc.

Grit.io
GritQL, Python, JavaScript, Apache Airflow

- Implemented GritQL migrations to automatically move codebases from **MomentJS** to **date-fns**.

Skills

Languages: TypeScript, Go, C++17, Haskell, Zig, ARM64, and MOS-6502 assembly.
Frameworks and libraries: SolidJS, React, Node, SFML, Raylib, LOVE2D, etc.
Tools: SQLite, Protobuf, Git, Docker, CMake, GNU Make, Bash, UNIX.
Domain interests: Functional programming, Databases, Type Theory, Compilers, and Systems.

Projects

Vyse – Programming Language | *C++ 17 · Lua · CMake · x86*

- Wrote a fast stack VM reaching within ±12% of Lua 5.1, and 35-42% faster than CPython 3.7 on benchmarks.
- Implemented an incremental mark-sweep GC with 97-98% average throughput.
- Devised an API for easy embedding in applications like game engines and web servers.

Nez – NES emulator | *Zig, 6502 ASM, raylib*

- Wrote an emulator for the NES console, with fully emulated CPU, PPU, APU, Cartridge, buses, and mappers.
- Implemented a modular emulator that can be used as a library, or be run in headless mode.

Bark – Static site generator | *Haskell*

- A fast SSG with hot reloading, a file system watcher, static file server, and custom templating engine.

Education

Silicon Institute of Technology, Bhubaneswar CGPA: 9.02
B.Tech in Computer Science and Engineering. *July 2019 – June 2023*