# Dilawar Singh

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I have significant experience as a tech lead and CTO. I can easily integrate into teams, build teams, and mentor juniors. I am very skilled at prototyping, developing, and modeling systems and web applications. I enjoy dealing with ambiguity at the interface of design and implementation. Slightly workoholic, loves Rust and other strongly typed stuff.

## Experience

***Senior Engineer**, Dognosis, Bengaluru* *2025 Jan-current*

- Currently writing a scalable EHR portal (PHP8, Codeigniter, HTMX) for medical record management, and a trainer app to conduct experiments with cancer sniffing dogs. Components includes real-time event processing using distributed queues (ntfy, Rust/Axum), data-APIs (FastAPI, Rust/Axum), ETL pipelines (Python) and data-storage (PostGreSQL, Victorialmetrics).
- I set up DevOps infrastructure (GitLab, CICD, Sentry) and observability stack (OpenTelemetry, Grafana), and backup services. I also conduct technical interviews.

***CoFounder & CTO**, Subconscious Compute, Bengaluru* *2019-2024*

- Subsconsious compute is a pre series-A endpoint cybersecurity startup. I cofounded it after my PhD and lead the developed of its flagship endpoint security product Shepherd.
- I hired and managed a team of 15 engineers for writing a cross platform endpoint-security solution that includes an agent, data-collection APIs, databases, and user portals.
- As an IC, I wrote kernel minifilter (C++, Win32) and contributed to endpoint observability agent (Rust, C++, Java) for cross-platform (Linux, Windows, OSX, Android) deployment.

***Research Fellow & GSoC Mentor*** *2016-2018*

- I was a mentor in Google Summer of Code (GSoC) 2016, 2017, and 2018. I mentored for the organization INCF for MOOSE.
- Added SBML support to MOOSE Simulator for reusing the existing models, and modernized build system using CMake for cross-platform build. I also helped porting HSolver to GPU using CUDA to speed up numerical computation.

***Firmware Engineer**, Kritical Solutions, Noida* *2009-2010*

- I was part of team for firmware development for movie-cameras on DINI board with RTOS Multi. I wrote image stabilization using Kalman filtering.
- I implemented version control practices and sedtup backup solutions for whole organization.

## Selected Projects

*Content management system and a community app* *NCBS Hippo*

Hippo was written to automatically and optimally schedules students' annual seminars, manages room booking, and managing talks on the campus. Wrote an accompanying Android App using `cordova+Vue+Framework7` (Google Play).

*Embedded System for lab automation* *Behaviour Box*

- This embedded system was built to run multiple batches of behaviour protocol automatically, to increase accuracy of stimuli triggers, control cameras, syncing, storing, and processing of sensor and video streams. I used C++/Python, Arduino Uno, BlackFly cameras.

*Other projects*

- Various rust crates e.g. safe rust bindings to Apple's endpoint security API, stream processing in Rust, WMI interface etc.
- Various python packages e.g. a utility to extract data from images of plots, Notion/Gitlab bridge, a UI for oscilloscope etc.
- A poor man's plagiarism detector – CodeSniffer – for coding assignments when I was a TA.
- Python binding and wheels for Smoldyn simulator and for MOOSE simulator using PyBind11.
- Fabrication of micro-electrode arrays for retinal prosthesis. Thesis advisor: Dinesh K. Sharma.

## Skills

**Languages**: C/C++, Python, Rust, PHP, Javascript/Typescript, LaTeX. **(familiar)** Haskell, VHDL/Verilog/Bluespec, SQL, Lua, LaTeX. Very familiar with scientific ecosystem of C++, Python. Love Rust!

**Softwares & Libraries**: **(databases)** PostGreSQL, MariaDB, Sqlite3, DuckDB, VictorialMetrics; **(devops)** GitLab, Docker, CMake, PyInfra/ansible, Bash, custom tools, **(cicd)** Jenkins, Gitlab Runners; **(observability/security)** Grafana, eBPF based sensors, OpenTelemetry, osquery; Open Build Service; **(libraries)** Boost, PyBind11, Win32, GDAL, OpenCV, scipy stack;

**Web**: **(frontend)** Vue3, React, HTMX; **(backend)** Codeigniter, Laravel, Axum, Actix, FastAPI; **(other)** Rust/Wasm, D3;

**Modeling, Design and Simulation**: PlantUML, TikZ; KiCAD, OpenSCAD; ModelSim, NgSpice; MOOSE, Neuron, Smoldyn.

**Advanced DSA**: Optimization using network Flows, Graphs and Linear Algebra, Computer Vision, Stochastic Datastructre, BDD and Model Checking. DSP and Audio Processing.

## Education

***PhD**, Computational Neuroscience, NCBS Bangalore (TIFR Mumbai), India* *2014-2019*

***PhD**, Digial Systems, IIT Bombay,* ***withdrawn*** *2010-2013*

***MTech**, VLSI, IIT Bombay* *2007-2009*