

# Rishi Krishna

## Computer Person



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kurisufriend

### EXPERIENCE

#### Hobby Project: custom Lisp-derived language & interpreter

2022 — present

kurisu-lambda (Python)

- Designed a custom spec for a Lisp-inspired functional language
- All components, from pre-processing to tokenization, lexing, and execution, were written entirely from scratch, with no external dependencies or references
- A comprehensive standard library for the language is currently being extended, with all components written in the language itself
- the language interpreter is also the base for several experiments in the field of Proof-based Compute Verification, namely separating the execution of a whole program into a series of defined states that can later be probabilistically verified

#### Open Source: Contributed to 4get.ca metasearch engine

2023 — present

4get (PHP)

- Wrote libcurl-based proxy pooling module, allowing instances to make tens of thousands of requests without being blocked or served challenges.
- Wrote the "oracle" system framework and a few modules for it, which tell you the time, do arithmetic, and convert numbers into various bases. search "4+4\*5", or "what time is it", or "9001" to see these in action.

#### Hobby Project: web service with many scratch-built elements

2023 — present

IPchan (C++)

- A message board service with only two core dependencies: Mongoose (for bare HTTP) and Sqlite3 (for permanence)
- All other services (incl. a CAPTCHA system and an HTML templating engine) are written from scratch
- The thesis of the software is that a different board is shown for each unique connecting IPv4 address — e.g. you would share one board with other people on your home network, and another with people on your work network
- In this way, communities are vaguely and emergently tied to geographic locations

#### Hobby Project: Bloat-free framework for Discord API

2023 — present

modular-discord-bot-fw (Python)

In my experience, all popular Python libraries wrapping the Discord API impose certain styles of programming or structure that I dislike. With this in mind, I made my own that loads features from plugin scripts.

#### Hobby Project: reverse-engineered Source Engine game trainer

2020 — 2021

camelia (C++)

Static (some version of IDA from forever ago) RE + leaked code snippets, making up a library that hooks the game's internal functions. Includes a pure DirectX3D9 UI/menu toolkit!

### EDUCATION

#### BS Computer Science 2023 — present

Virginia Tech

transferred in ~60 credits and declared my major early, VT Amateur Radio Association, VT Linux & Unix User Group

#### High School

2019 — 2023

Heritage High School

William G. Enloe Magnet High School

### SKILLS & TECHNOLOGIES

**Programming** — C, Python, C++, Elixir, Scheme, Bash/POSIX shell, git, PHP, Nim, my personal language.

**Reverse Engineering** — Static binary decompilation (Hexrays/IDA), flow tracing, external process memory reading/writing via OS API calls, internal function hooking/hijacking via forcibly loaded libraries and tramp/detour hooks, .NET decompilation via dnSpy, runtime analysis via x64dbg, circumventing binary packing/obfuscation.

**System Administration** — have personally run externally-facing servers since middle school, Proxmox with Ubuntu Server VMs, RAID, automated backup, Dell iDRAC, etc.

**Security** — created several toy self-spreading botnet scripts and tested them on generated local unixlike networks, a script that gets a service version from a portscan and automatically fetches a CVE PoC from MITRE and trickiest/cve, helped find a path traversal CVE in 9front's HTTP server.

**ML** — I wrote an image classifier for busting CAPTCHAs once in pytorch

**Networking** — implementing higher-level protocols atop TCP/UDP if given specification, nginx for load balancing and reverse proxies, DNS records, anti-DDOS measures, caching, etc.

**RF** — I have a Technician-class ham radio license, callsign KQ4KJB. working on my General-class.