Aswin C

Personal website and blog: officialcjunior.github.io
Email: aswinc.mailbox@gmail.com
LinkedIn: linkedin.com/in/aswin-c
GitHub: github.com/officialcjunior

Education

- **Amrita Vishwa Vidyapeetham** — Kollam, India
  Bachelor of Technology in Computer Science and Engineering; GPA: 9.1/10 — *July 2019 - June 2023*
- **Ben-Gurion University of the Negev** — Be'er Sheva, Israel
  Summer school in Data Mining and Business Intelligence for Cyber Security Applications — *July 2022 - August 2022*

Work and research experience

- **Google Code-In** — Remote
  Student developer — *July 2018 - Sept 2018*
  - Completed Google Code-In and received the certificate of participation. Got a gist of what open source software development is and how it works in Ubuntu and OpenSUSE.
- **teambi0s** — Kollam
  Member & mentor — *July 2019 - Present*
  - Member of the hardware team—work includes reverse-engineering, systems software development, designing custom hardware and participating in Capture The Flag tournaments and other cybersecurity-themed competitions.
  - Helped in coordinating InCTF Nationals and InCTF Internationals—both Capture The Flag tournaments—by mentoring students and creating puzzles in the area of reverse engineering.
  - Developed a custom hardware badge for InCTF 2019, a device to enable students learn about IoT security.
  - Managed the social media accounts during the InCTF conference and other events.
- **Cisco** — Remote
  Freelancer—Cybersecurity consultant — *September 2019 - December 2019*
  - Worked on creating a 3D model of a Smart Home and demonstrated live exploits of vulnerabilities present in various popular smart devices.
- **Adam Engineering** — Remote
  Freelancer— cybersecurity Consultant — *November 2020 - January 2021*
  - Worked on reverse engineering an ECU firmware of a automotive vehicle of a popular motor corporation to research about its CRC algorithm.
- **Google Summer of Code—Rizin Organization** — Remote
  Student developer — *May 2021 - Sep 2021*
  - **Support for CPU and Platform Profiles**: Added support for editable CPU and platform profiles, which added flexibility in maintaining platform-specific data about MMIO and IO ports of development boards.
  - **Developed rz-uefi**: Ported and improved a tool for analyzing UEFI modules with the Rizin reverse-engineering framework.
  - **Developed rz-svd**: A tool which can parse SVD descriptor files and add the relevant information as comments and labels in the Rizin reverse engineering framework.
- **Schneider Electric** — Remote
  Cybersecurity consultant — *April 2022 - June 2022*
  - Developed Capture The Flag tournament challenges (puzzles) for the categories: firmware reversing and Linux kernel programming.

Talks and presentations

- **FOSSMEC - Sliding into GSoC** — Thrikkakkara
  Guest speaker — *2 December 2022*
  - Spoke at 'Sliding into GSoC' - an event conducted by FOSSMEC to promote open source and to educate the members of the Open Source community at Model Engineering College, Thrikkakkara about Google Summer of Code.

Open Source experience

- **radare2 Organization** Remote
  Open Source contributor *June 2020 - Dec 2020*
  - Developed a pseudo-disassembler plugin for RISC-V architecture—a tool which displays the raw assembly instructions in a pythonic syntax—making reverse engineering programs written for the RISC-V architecture easier.
  - Refactored the implementation many existing commands which supported the JSON output mode to use dedicated APIs.
- **Rizin Organization** Remote
  Member of the organization and developer *March 2021 - Present*
  - Implemented RzArch—a single module to house all architecture related APIs and data structures.
  - Implemented a tree-sitter based command parser for better performance in parsing user commands.
  - Contributed to the Rizin book—Rizin's usage manual: wrote articles, added examples, helping tips and documentation for the APIs. Ported Rizin's documentation book from the mdBook framework to the Quarto publishing framework.
- **Arch Linux** Remote
  Community member *March 2022 - Present*
  - Contributed to asknot-ng—a web app that helps beginners navigate through what they can do for the Arch Linux community depending on their area of interest.

Projects

- **Adversarial attacks on Speaker Recognition models**: Implemented a Fast Gradient Fourier Transform and Projected Gradient Descent attack on the DeepSpeech2-based speaker recognition model—under Prof Asaf Shabtai and Shoham Hanina of the Ben-Gurion University of the Negev, Israel.
- **Firmware security analysis of Internet appliance devices from SonicWall**: Employed a full-stack research on the devices which involved testing the on-chip implementation of chip-level protocols such as UART and JTAG, and of the software-level protocols such as HTTP and FTP.
- **DataSketch**: a web-app to easily plot graphs and visualize data with just a few clicks—aimed at people who are inexperienced with code.
- **kin-ecdote**: Created an audio-streaming platform for the elderly to share their stories and wisdom. Worked on engineering the audio streaming backend and UI design.
- **kalyani**: a simple tool to control the screen brightness for better reading experience in dark environments.

Skills Summary

- **Languages**: **Proficient:** C, Python, Java, Bash
  , **Intermediate:** Rust, Haskell, C++, R, x86 assembly
- **Applications**: Linux, BSD, QEMU, Rizin, Docker, Ghidra, GDB
- **Soft Skills**: Public speaking, event management, writing

Publications

- **FuzzRTOS—a novel framework to find vulnerabilities in FreeRTOS applications (Ongoing)**: Aravind Machiry, Anand Balaji, **Aswin C**, Gourav Singh Bajeli, Hrishikesh Pankaj

Capture The Flag tournaments and other competitions

Hardware Security CTF at Nullcon Security Conference, Goa: Won the Hardware Security CTF with teambi0s at the Nullcon security conference in Panaji, Goa. Interacted with experts of automotive security and Software Defined Radio.

CSAW Embedded Security Challenges finalist: Completed the initial set of puzzles and qualified for the finals of CSAW ESC 2020 and 2021- a CTF aimed at embedded devices' security hosted by NYU and CSAW. The puzzles were about reverse engineering firmware written for the RISC-V architecture, and Side Channel and Fault Injection attacks.

IEEE National RFID Challenge 2021 runner up: Implemented a COVID-19 vaccine verification system using RFID-based secure authentication for the IEEE National RFID Challenge 2021 using a MFRC 522 for reading the RFID, MLX 90614 for measuring temperature and ReactJS for interacting with CoWIN-API.

MITRE Collegiate eCTF: Worked on designing and securing a radio technology protocol based on Secure Common Embedded Wireless Link (SCEWL) protocol. The competition involved securing the SCEWL Bus Controller from replay attacks, and counter packet injection.

Hac'KP Hackathon: Researched and proposed a GPS-free geo-location tool by implementing low-power LoRaWAN technology for law enforcement to track inmates.