

Alexei Solonari

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EDUCATION

- *University of Central Florida* — Orlando, FL | 2022 - Expected Fall 2026
 - Bachelor's Degree in Computer Engineering, University GPA: 3.44

EXPERIENCE

Systems Software Research Assistant

- APPLeSEEd Lab, Dr. Paul Gazzillo (University of Central Florida) | Jan 2024 - Present
 - **Independently designed and implemented** a redesigned constraint-solving algorithm for analyzing Linux kernel configurations: **reduced runtime by up to 49x** (from 7 hours to 8 minutes), and improved Kconfig option distribution through divide-and-conquer strategies and optimized Z3 SMT solver usage
 - Built automated pipelines for generating and testing random Linux kernel configurations (**randconfig**), guiding toward useful kernel configurations that **expose vulnerable code paths**
 - Proactively **diagnosed and resolved critical bugs** in core components of **kmax** tool suite, unblocking continued research work and improving tool stability
 - Identified and validated a minimal set of Linux Kconfig options that **improved randconfig boot success from 0% to 93%**, significantly enhancing the effectiveness of kernel fuzzing and testing

Additional Experience

- *Fleming's Prime Steakhouse & Wine Bar, Winter Park*: Backwaiter (Mar 2023-Jan 2024)
- *DOMU Chibi Ramen*: Front of House Associate (Aug 2022-Mar 2023)
- *WonderWorks Orlando*: Food & Bevg. Team Member (Jun 2022-Aug 2022)

PROJECTS

Robinwaita — User-Friendly Process Scheduler for Linux

- Personal Project | Technologies: OS-level C programming, Linux kernel APIs, Python, GTK 4, Libadwaita
 - **Easy-to-use round-robin process scheduler** that runs in userspace
 - Context switches handled with **Linux-native timer APIs** (timerfd) for high precision
 - **Bundled tester programs** in Python that perform CPU-bound, I/O-bound, or multi-bound operations
 - **GTK 4-based user interface** built with modern Libadwaita features to easily manage tester processes and view statistics.

OpenController — HID Gamepad Built for Accessibility

- *ShellHacks 2024* Group Project | Technologies: Arduino, embedded C++, React, Tailwind
 - An **HID-compatible gamepad device** built with arcade buttons, joystick, and Arduino Micro to provide an affordable, open alternative to accessibility-focused Xbox Adaptive Controller
 - Web interface switches user between gamepad mode and keyboard mode, in which controller buttons can be mapped to keyboard bindings. Saves settings to **internal Arduino storage** (EEPROM)
 - UI built in React and Tailwind, connects to controller via **Web Serial API**

Additional Projects

- *Grower* (Budgeting App): Knight Hacks 2023 Group Project | Tech: Tkinter, Python, Alpha Vantage
- *Attractulator* (ML Facial Expression Detector): ShellHacks 2023 Group Project | Tech: TensorFlow, Python

ADDITIONAL SKILLS

- C, Java, Python, Git, GitHub, GitLab, Mercurial, TensorFlow, Jupyter, API, XML, C++, shell scripting, Data Structures & Algorithms, embedded programming, Raspberry Pi, Arduino, object-oriented programming, software development, hardware engineering, firmware, low-level software engineering, operating systems, front-end, back-end, full-stack, Windows, Linux, macOS, Bash, Z Shell, scripting, command line, terminal, IDE, computer science, electrical engineering, linear circuits, statistics, real-world experience, verbal & written communication, soft skills, customer service, collaboration skills