ANGELINA TSUBOI

Programmer & Security Researcher & Mechatronics Developer

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I am a pragmatic and goal-oriented developer and security researcher with over 10 years of experience in full-stack development, specializing in secure software and hardware solutions. Proficient in over 20 programming languages, I've developed web and mobile applications, command-line tools, developer utilities, hardware prototypes, and AI models with a strong focus on security. My career spans work with over 15 startups and organizations, complemented by my role as an educator, teaching aerospace cybersecurity to thousands through both in-person and online workshops.

My security research delves into signals intelligence, rapid prototyping of hardware hacking tools, OSINT / reconnaissance, aerospace, and open-source development. I have presented on diverse security topics, including aerospace cybersecurity, Wi-Fi, and signals intelligence, at major conferences like LayerOne, DEFCON, and HackSpaceCon.

EXPERIENCE

SATELLITE COMMUNICATIONS DEVELOPER
July - Aug 2024

Engineered and deployed satellite automation programs utilizing C, Bash, and Python configuring a custom networking sandbox environment for both the uplink and downlink. Executed in-depth testing on satellite antenna equipment, leveraging Vector Signal Analyzer and Generator equipment. Learned to configure S-parameters, attenuator calibration, and developed in-depth knowledge on satellite telecommunications infrastructure.

NASA SEES RESEARCHER
May - Aug 2024

Conducted scientific research for NASA remotely researching the volatile composition and pairings of meteorites collaborating with a team of scientists across the nation. Collaborated on a paper entitled "Unraveling the Origins and Evolution of Terrestrial Bodies Through Matching and Volatile Signatures" which was submitted and accepted at multiple conferences and organizations such as AGU and MIT's 2023 UTRC conference.

CYBERSECURITY INSTRUCTOR
2021 - present

I taught online and in-person workshops around various hardware, signals intelligence and aerospace cybersecurity topics such as drones, satellites, and aircraft to thousands of people. My written instructional articles around aerospace security topics have been featured by Pentest Mag, DroneSec, Hackernoon, Hackster.io, Hackaday.io, and many other sources. I also create instructional cybersecurity content for Retia and attend SecurityFWD's weekly livestream organized by Varonis. Attended DEFCON 2022 x 2023 and sold my custom PCBs and taught hardware classes.

SOFTWARE & MECHATRONICS DEVELOPER

Independently contracted with other 15 startups and companies developing a range of technologies such as web applications, security tools, command line utilities, hardware devices, machine learning models for research, and much more. I have worked with a wide breadth of web frameworks, programming languages, and maintain proficiency with the latest development tools. I have also worked on coordinating leads, marketing products, and project management

ACCOLADES

FEATURED ON BUSINESS INSIDER AND ENTREPRENUER

Featured for my achievements in the fields of computer science, mechatronics development, and aviation / aerospace. Read the article at this link.

APPLE WWDC SWIFT STUDENT CHALLENGE

I won Apple's international Swift Student challenge for my mobile applications alongside my previous STEM accomplishments. I was invited to present my application to CEO Tim Cook at Apple's headquarters in Cupertino. Read the article at this link.

USAF CADET WINGS & LACSF NAVAL RESEARCH MEDAL

Cadet Wings is an ultra-competitive aviation scholarship that funds up to 65 hours of flight time for selected awardees to receive their private pilot license. I was also given a Research Medal Special Award from the U.S. Navy at the Los Angeles County Science Fair for my science fair submission titled "ADS-B Spoofing Detection using Neural Networks and RF Fingerprinting"

SKILLS

(Scripting) Languages, Shells, DBs: *Python, Java, Javascript, Typescript, Golang, Ruby, Rust, C, C++, C#, Swift, HTML, CSS, SCSS, Lua, Markdown**; **bash (3-5.x)**; **Firebase, MongoDB, MySQL*

Frameworks, Libraries: *React, Angular, .Net, Ionic, Next.js, React Native, GraphQL**; **Flask, Express, Django, TensorFlow, and NGXS*

IDEs, AI: *IntelliJ IDEA, PyCharm, CLion, GoLand, Atom, VSCode, Neovim**; **Copilot for CLI (bash and zsh), Claude-Sonnet, Grok-2, GPT-4o*

Virtualization, Cloud: *Oracle Virtual Box, Docker, AWS, GCP, Vercel, Heroku*

OS, Applications, SaaS, Sec: *Ubuntu, Kali Linux, Wireshark, tcpdump, nmap, Ghirda, aircrack-ng, ssh, cron*

Signals Intelligence: *Amateur Radio (KN6QAT), RTL-SDR, Airspy, HackRF, GNU Radio, Microwave Signals Analysis, S-Parameter Configuration, and Satellite Modulation Scheme Analysis*

Mechatronics Engineering: *KiCad, EasyEDA, Fusion360, Soldering, and CAD Design*

Misc: *Photography (ZV10), drone photography (DJI series), Ableton, (audio engineering), Da Vinci Resolve (video editing), and THT/SMD soldering*

PROJECTS

OPEN-SOURCE CYBERSECURITY TOOLS

SatIntel: OSINT tool for Satellites. Extract satellite telemetry, receive orbital predictions, and parse TLEs

netspionage: Network analysis framework for enumeration and attack detection

Fly Catcher: Raspberry Pi based device to detect for spoofed aircraft broadcasted on the 1090 MHz frequency utilizing the FlightAware SDR and a custom Convolutional Neural Network

Payload Wizard: AI assistant leveraging GPT models to interpret and generate payloads

intellishell: Ruby based AI-powered terminal session logger and analyzer

astroguard: Code auditing and profiling tool based on gcc for C programs for NASA JPL Rule of 10 compliance

skytrack: Planespotting and aircraft OSINT tool made using Python

bashsweep: Tool for automating bash cleanup tasks with cron jobs

AEROSPACE CYBERSECURITY COURSES

I partnered with Pentest Magazine in order to create an online course entitled "Aerospace Cybersecurity: Satellite Hacking" which covers the foundations of reconnaissance, communication dissection, decoding, and vulnerability analysis. Learn about the course at this link.

PROGRAM CONTRIBUTIONS

AeroRust/nmea: Developed an APA sentence parser using Rust for GNSS NMEA marine message parsing

Videos for Retia and SecurityFWD: Educational aerospace security guides on satellite tracking, jamming analysis, OSINT, AI assistants, and more

MOBILE AND WEB APPLICATIONS

designr: browser extension for inspecting and saving CSS styling on web pages

Pocket CPR: Apple Watch applications to teach the basics of CPR via haptics

Pilot Fast Track: a web application for pilots to get access to scholarships

ctv: a Rust powered command line utility for configuring tree display outputs

PCB BOARDS AND HARDWARE PROTOTYPES

WiCon Kit: ESP8226 based portable Wi-Fi reconnaissance suite

nRFi Monitor: 2.4GHz band and WiFi analyzer toolkit

Meow Mixer PCB: educational PCB sold at DEFCON and other maker spaces

555 Airplane PCB: 555 IC Circuit of Airplane PCB with Astable Dual LED Flashing

Open Buoy: buoy device that conducts tsunami detection and marine research

TALKS & INTERVIEWS

DEFCON 32 - AEROSPACE VILLAGE

Fly Catcher - How I Developed a Low-Cost Raspberry Pi Based Device for ADS-B Spoofing Detection

LAYERONE 2024

Outlined my experience reverse engineering communications from satellites:
https://youtu.be/kDUIAfBYFsE

DAVID BOMBAL INTERVIEW

Spoke about my background in cybersecurity and software development alongside my projects within the space security sector:
https://youtu.be/U1-pOPFKcXo

FOX 11 NEWS INTERVIEW

I was given the opportunity to talk about my background in mechatronics, scientific research, and programming live on Fox News:
https://www.youtube.com/watch?v=ub2LY3h-6NE