ALEXANDER S. FRANCHUK
Software Developer and Computer Scientist

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SKILLS AND KNOWLEDGE

- Practical and diverse experience in embedded systems, networking, GUI/TUI, web development, native mobile development (Android and iOS), and cross-platform applications.

- Passionate about programming languages, operating systems, and any challenging problem I can get my hands on.

- A very fast learner who gets along with others easily and works efficiently and diligently on tasks. Motivated self-starter.

- Fairly familiar with 4G and 5G protocol stacks (from RF samples to data; mostly focused on physical, MAC, RLC, PDCP, NAS, and IP layers).

- Fluent in C++ (C++17, much of C++20), Rust (stable, occasionally nightly), C (C11), C# (.NET 4.5, WPF), Haskell, and 7 other languages, somewhat experienced (not entirely fluent) with a handful more. Ask if curious.

- Experienced user of GNU make, CMake, GitLab CI/CD, Atlassian tools, JFrog Artifactory, Wireshark, GDB/LLDB, sanitizers, Linux perf, Git, and Subversion.

- Extremely capable GNU/Linux user, developer, and administrator. Have also developed programs for Windows, OSX, and Plan9, and applications for Android/iOS phones and tablets. Architectures include AVR, ARMv7, ARM64, x86, and x86_64. Avid supporter of open source licensing and community development models.

PROFESSIONAL EXPERIENCE

MOZILLA, SENIOR SOFTWARE ENGINEER (January 2023–Present)

CACI INTERNATIONAL INC: LGS LABS, SOFTWARE DEVELOPMENT ENGINEER (March 2019–December 2022)
LGS BELL LABS INNOVATIONS, SOFTWARE DEVELOPMENT ENGINEER (August 2015–March 2019)

- Architected and developed 4G LTE and 5G NR protocol stacks for both transmit and receive operation, optimizing for real-time operation on general purpose CPUs.

- Spearheaded and implemented *many* developer operations and quality of life improvements and optimizations, including but not limited to: CI/CD, internal packaging and distribution, compile time and artifact reuse, build systems, and internal documentation accessibility.

- Architected and developed a novel task running programming language in Rust, used as a build system (and for general purposes) internally, to guarantee build correctness and optimize speed and developer experience.

- Implemented various other wireless protocol processing libraries in C, C++, and C#. Targets include embedded systems (DSPs) and Linux, Windows, and OSX servers.

- Architected and developed an Android React Native application which communicated with a custom radio to control and stream live audio (among other information), and to coordinate with other users in a mission setting. Also developed the radio firmware.

- Developed advanced signal processing toolchains for a distributed radio interference monitoring system, handling hundreds of megabytes of data per second in real-time.

- Developed feature-rich C# WinForms and WPF GUIs and a signal analysis software suite. Supports custom user layouts, a backend PostgreSQL database and advanced real-time visualizations (processing and displaying gigabytes of data, where accuracy was paramount).

LGS BELL LABS INNOVATIONS INTERNSHIP (Summer 2014)
Developed mass data tiling software and visualization plugins for C#, an AVR bootloader for flashing from an SD card, and interfaced multiple unique radios with GNURadio.

ICIMS SOFTWARE DEVELOPMENT INTERN (Summer 2013)
Worked on internal tools which performed asynchronous SQL queries on thousands of databases simultaneously. Also worked on machine learning algorithm to classify job candidates.

EDUCATION

CARNEGIE MELLON UNIVERSITY, Pittsburgh, PA — 2011–2015
B.S. in Computer Science, Additional Robotics Major
Graduated with GPA of 3.94/4.0, University Honors