Thomas Reed Hedges

"Reed", he/him

reedhedges@gmail.com | linktr.ee/reedh | linkedin.com/in/reedhedges | github.com/reedhedges

+1-603-831-4007 | US/Eastern time zone | github.com/reed-adept | github.com/MobileRobots

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Systems, library and application developer with strong commitments to: efficient, correct, maintainable, reliable software; long term code and product sustainability; user experience; good documentation; collaboration; learning, teaching and mentorship. Experience supporting other developers and domain experts with quality libraries, tools, and implementations in C++ and other languages. Able to wear several hats when needed, contribute more than just code.

Skills:

Highly experienced with: (10+ years)

C++, (including C++03, C++11, C++14, C++17, C++20); Updating and modernizing C++ **legacy code**; Cross-platform development for **Linux** and **Windows**; Development and packaging for Ubuntu, Debian and RedHat Linux; **C**; **Python**; **Bash**; **CMake**; GNU **Make** and **Makefiles**; GNU **Autotools**, Windows development with Microsoft **Visual Studio/Visual C++** and **MinGW**; **Git**; **ROS1** (Robot Operating System 1); **GTK+**; **SWIG** (automated language bindings generation); **Doxygen**; MediaWiki customization; **Documentation** and technical writing; Training; Sensors and other hardware; Collaboration and communication with remote colleagues, customers, vendors and partners.

General or basic knowledge of: (<2 years, occasional, or limited use)

Qt, QML, Javascript, HTML and browser DOM API, node.js, CI/automation tools (Travis, GitHub), Rust, Android, Matlab, Perl, Java, Catch2, Docker, d3.js, Madcap Flare, ReStuctured Text (ReST)/Sphinx, build2; Embedded systems and microcontrollers; Basic electronic and mechanical assembly, troubleshooting and repair; Basic MIG welding.

Interested in gaining more experience with:

Modern C++, Rust/Go/Dart/Swift/Kotlin/other languages, React/Svelte/Vue/Flutter/other frameworks, user interfaces, visualization, scientific applications, GIS, embedded systems, mobile development, debugging and testing tools and techniques, better software engineering practices, mentoring and teaching, and much more.

Experience:

2019-2023: Independent Developer, Open Source Software Maintainer

(Part Time)

- Prototype mobile and desktop applications using Qt, QML, C++, and other languages and frontend frameworks.
- Maintained and supported forks of former Adept MobileRobots and community-developed open source projects. Improved code efficiency, correctness, quality, reliability, test coverage, modernization. Resolved user issues.

2010-2018: Software Engineer, Lead Developer for "Pioneer" Research products, Omron/Adept MobileRobots

2004-2010: Software Engineer, Individual Contributor, ActivMedia LLC/MobileRobots, Inc.

- Responsible for development and maintenance of multiple C++ SDKs and tools for external customers (university research roboticists) and internal developers at Omron/Adept.
- Built MobileSim mobile robot simulator application incorporating open-source "Stage" engine, with added features, bug fixes, and ports to Linux, Windows and MacOSX. Used both by external end-user customers, and internally by other developers within the company. Implemented using C, C++ and GTK.
- Implemented device protocols and integrated 3rd party vendor libraries with new APIs including NMEA for GPS, robotic arms, LIDAR sensors, etc. Validated, documented, and integrated/adapted vendors' SDK resources.
- Integrated mobile manipulator system with two robotic arms, Kinect camera, pan/tilt mechanism, multiple computer systems and mobile robot base vehicle. Developed demo software. Wrote documentation.
- Integrated speech synthesis and voice recognition libraries into SDK and applications.
- Integrated "speex" audio codec library, implemented audio network transmission, and user interface using Qt.
- Created wrapper interfaces for SDKs for Python, Java, Matlab, C, C# and Rust using SWIG and other tools.
- Redesigned and implemented automated build and release system to support multiple Linux and Windows platforms and architectures, rapid builds and testing, and public release distribution, with minimal dependencies.

- Developed and maintained custom Windows 7 Embedded and Windows XP Embedded installations using Windows OEM System Builder/Windows Embedded tools and custom scripts.
- Developed and supported production-critical automated deployment and configuration system used by manufacturing department when assembling and configuring customer orders. Implemented in Python.
- Made contributions to open source projects used by customers (ROS and related projects).
- Supported research project to develop and test a semi-autonomous wheelchair for disabled users.
- Responsible for providing high quality customer support. Responded to unique and difficult customer questions and problems in cooperation with robot support technicians. Contributed to and moderated discussion forums.
- Led investments in better documentation, online knowledge base, manuals. Improved internal documentation.
- Represented company at international industry conferences and exhibitions; developed product demos and activities; assisted with exhibition planning and logistics; networked with customers and vendors.
- Key participant in marketing and product management decisions.
- Performed industry and market research through product/vendor analysis, customer interviews and support trends, and by surveying and summarizing academic and industry publications.
- Taught user training courses, customized to customer requests.
- Supervised and mentored college and high school summer interns

See http://tinyurl.com/MobileRobotsArchive and http://tinyurl.com/MRSupportArchive for archived websites.

Other Experience:

2022: Electronics and Programming Exploratory Teacher, Compass School, Westminster VT
Supervised middle school students in electronics design and programming projects.

2019-2022: Developed personal homestead providing eggs, meat and vegetables to family. (Part time)

2001-2003: Undergraduate Research Assistant, UMass Robotics Lab and Wearable Computing Group
Distributed multiuser augmented reality system with wearable computers for robot visualization and control.

1999-2000: Programmer/Analyst, Schepens Eye Research Institute
Software used for research on assistive medical technologies and perception in VR and with stereoscopic displays.

Publication: Peli, Hedges, Tang, Landman, "A Binocular Stereoscopic Display System with Coupled Convergence and Accommodation Demands", in Proceedings of Society for Information Display, June 2001.

Education:

University of Massachusetts (UMass), Amherst, 2004, B.A. Communications, Minor: Computer Science

Recent Online Classes and other Training:

- ✓ Tutorials/webinars/online training on: C++, Qt, Python, Javascript, Rust, Svelte, Flutter/Dart, embedded systems; Various conference talks (CppCon, C++ Weekly, Meeting C++, Qt, etc.), 2019-present.
- ✓ Android Basics in Kotlin (Google), 2022.
- ✓ Fundamentals of Remote Sensing and other webinars and training (NASA ARSET), 2021-2022.
- ✓ Functional Programming in Erlang (University of Kent / FutureLearn), 2020.
- ✓ C++ Mini Courses (PluralSight): C++17 Beyond the Basics; STL Algorithms; High-performance Computing in C++ (Introduction to SIMD, OpenMP, MPI and C++ AMP), 2020.
- ✓ Data Visualization and D3.js, (Udacity.com UD507), 2019.
- ✓ AWS Cloud Practitioner Essentials (Amazon), 2019.
- ✓ Intro to Parallel Programming with CUDA, (Udacity.com CS344), 2015.

References:

Omron Adept Technologies department of Human Resources, 1-925-245-3469, oathumanresources@adept.com
Nancy Armstrong, HR Manager, Omron Management Center of America, Nancy.Armstrong@omron.com.
More references available upon request.