

Thomas Reed Hedges

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“Reed”, he/him

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github.com/MobileRobots

Systems, library and application developer with strong commitments to: high quality, maintainable, reliable software; user experience and usability; good documentation; collaborative, respectful, equitable working environment; learning, teaching and mentorship. Experience supporting other developers and domain experts.

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, recent, or basic experience with:

(<2 years, occasional, or limited use)

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

Interested in gaining more experience with:

Modern C++, Modern Python 3 and advanced techniques, Rust/Go/Dart/Swift/Kotlin/other languages, React/Svelte/Vue/Flutter/other frameworks, user interfaces, visualization, augmented/mixed reality, scientific applications, GIS, embedded systems, mobile development, debugging and testing tools and techniques, better software engineering practices, mentoring and teaching, marketing, writing, project planning and management.

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. This software was used to develop experimental research applications and production industrial application components for multiple types of mobile robot systems.
- 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 vendor SDKs and updates.
- 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 better support multiple Linux and Windows platforms and architectures, rapid builds and testing, and public release distribution, with easy maintenance and 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: Managed personal homestead providing eggs, meat, fruit 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 Management Center of America department of Human Resources, 1-224-520-7650.

More references available upon request.