# **Curt Henrichs**

Software Engineer

## Aspiration

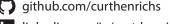
I am passionate about building real things for real people.

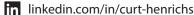
My interests include human-robot interaction, embedded systems, software engineering, and mixed-reality interfaces.



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Skills

Python, ROS, Git, Atmel, C/C++, Linux, Javascript, React, Angular, Unity/C#, Keras, MATLAB, Movelt/Relaxed-IK

#### Education

(2018 - \*)M.S. in Computer Science ~ Emphasis: HCI / HRI

University of Wisconsin - Madison, Madison, WI

Coursework: Human Computer Interaction Artifical Intelligence **High Performance Computing** + Wearables + Machine Learning + Adv. Computer Architecture

+ User Modeling + Computer Vision + Data Visualization

- Human Robot Interaction -

(2014 - 2018)B.S. in Computer Engineering ~ Emphasis: Embedded Systems

Milwaukee School of Engineering, Milwaukee, WI

Coursework: Embedded Systems Software Development Buisness / Management + Operating Systems + Computer Architecture + Servant Leadership + Entrepreneurship

+ Digital / Analog Circuits + Data Structures + Control Systems + Computer Vision + Digital Signal Processing + Neural Networks + Computer Networking + Computer Graphics

- Engineering Practices -

### Experience

(2019 - \* )

Graduate Research Assistant ~ People and Robots Lab, Computer Sciences

Ouniversity of Wisconsin - Madison, Madison, WI

- Developed collaborative robot (cobot) authoring and training interfaces [Authr, Expert View Dashboard].

- Researched interactions with cobots for both supervision tasks [pRAD] and levels of task interdependence.

- Worked with serveral colleagues outside of lab (in Human Factors and Optimization) to investigate cobot effectiveness when deployed on a variaty of manual work activies.

Contributed robot capability analysis as inputs into allocation algorithm.

- Contributed to lab infrastructure and processess.

Ex. Maintained centerialized robot description and configuration repository for lab.

Ex. Device bringup and documentation (Universal Robots UR3e, Microsoft Hololens 1 & 2).

Ex. Debugged and updated Robotig gripper ROS drivers for colleague under paper deadline.

- Assisted colleagues with their user studies, technical development, and paper writing.

#### (2016 - 2018)R&D Software Engineering Intern

Dedicated Computing, Waukesha, WI

- Responsible for development of embedded firmware in C/C++.

- Prototype server hardware and software systems [Matrix Storage, Fan Controller].

- Integrate embedded devices into server control software with Python.

- Developed internal hardware testing infrastructure [Thermal Chamber] with NodeJS, Python, and MongoDB.

- Produce product life-cyle documents for design, implementation, and testing.

# **Notable Projects**

#### Authr ~ Cobot authoring environment.

- Developed an Angular web app with ROS backend.

- Used Movelt to compute motion plans and time-of-flight.
- Custom domain language designed around Therbligs.

#### Expert View Dashboard ~ Cobot training environment.

- React web app with ROS backend and Unity simulation.
- Operationalizes expert thinking into a checklist novices use to develop their programs with custom domain language.
- Explored Microsoft Hololens as an alternate XR interface.

#### PRAD ~ Evaluation of cobot operator interfaces.

- Applies predictive robot attention demand (pRAD) to cobots.
- Developed two widgets (timeline and timer) evaluated for task and collaborative outcomes in human-subjects study.
- Captured design suggestions from participant interviews informing future implementation.

#### Automated Thermal Chamber Testing.

- Developed several subsystems:
- Unit-Under-Test state scraper captures CPU and GPU configuration / sensor values with NodeJS.
- Thermal couple monitor running on NI cRIO.
- Chamber control server with NodeJS issues low-level TCP byte commands.
- Integrated subsystems into internal testing software.

#### Matrix Storage ~ Server Backplane Controller.

- Developed controller firmware with Atmel C.
- Aggregates PSU, fan, and environment sensing and control for Linux node on I2C system bus.
- Wrote Python interface between application and controller.

#### Programmable Fan Controller.

- USB UART with JSON API to configure programmable thermal profiles with individual fan control.
- Firmware written in C for Atmel ARM microcontroller.



GPA: 3.7 / 4.0

GPA: 3.9 / 4.0

+ Ethics for Mgmt. and Eng.



