Rhian C. Preston

CONTACT INFORMATION

Graduate Research Assistant
Oregon State University, SHARE Lab
Robotics, Software, and Electrical Engineering

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RESEARCH INTERESTS

Human-robot interaction, socially assistive robotics, robot assisted human-human interaction, human perception of robot shape/motion

PHD **Oregon State University**, ROBOTICS **September 2020 – Current**

MS **Worcester Polytechnic Institute**, ROBOTICS **January 2015 – Jun 2019**

MS **University of Wisconsin - Madison**, NUCLEAR ENGINEERING **Aug 2013 – Dec 2014**

BS **Oregon State University**, NUCLEAR ENGINEERING **January 2011 – Jun 2013**
- Minor in Physics

WORK EXPERIENCE

Framatome Inc., Lynchburg, VA

Design Engineer, Voyager Rotational Program **Sep 2016 – July 2020**
Multi-year rotational program for accelerated development of young engineers.

Software & Electrical Engineer III, Non-Destructive Examination Team **Aug 2019 – July 2020**
Develop user tools for camera recording, snapshotting, and setup via remote client to third party multi-camera surveillance system.

Electrical Engineer III, Stearns-Roger Services **Aug 2018 – Aug 2019**
Path planning, communication, and UI for smart crane system. Interface between Siemen's PLC and C# WPF application with persistent database.
Simulation application for operator training for smart crane system.
Schematics, interconnect, wiring diagram, and PLC design for a smart crane system.

Software & Electrical Engineer III, Non-Destructive Examination Team **Jan 2018 – Aug 2018**
Microcontroller specification, PCB troubleshooting, and software development and implementation for PoE inspection system. Included embedded C programming of PIC microcontrollers for variable number of motors as well as analog camera control.
Development of C# inspection plugin with UI and SQLite database for inspection data.
On-the-fly kinematics and feedback for UR-10 robot arm through a C++ with Qt plugin.

Fuel Design Engineer II, Fuels Neutronics - Boiling Water Reactors **Nov 2015 – Dec 2017**
Boiling water reactor neutronic licensing analysis. Core and bundle fuel design.

Engineering Intern, Fuels - Site Support **Jun 2013 – Aug 2013**
Python development of UI wrappers for Fortran code.
Qt rebuild for Windows 7 of Java application for in-core monitoring.

RESEARCH EXPERIENCE

Oregon State University, Robotics Dept.

Graduate Research Assistant, OSU SHARE Lab **July 2020 – Current**

Workplace Companion Robot Project **July 2020 – Current**
Development and deployment of a desktop break-taking system utilizing the Anki Cozmo robot. Designed and ran a three-phase, two month long, in-situ human subject study where the desktop system acted autonomously in the participant's space for the two month period, and autonomously transitioned between study phases.

Graduate Research Assistant, Deep Pressure Therapy Vest **August 2021 – Current**
Assisted in fabricating study hardware and testing the study design. Acted as a researcher and stress-stimuli in study of efficacy. Assisting with data analysis of qualitative results.

Graduate Research Assistant, Robot Arm Visual Characteristics **March 2022 – Current**
Designed visual stimuli, study procedure, and Qualtrics survey.

Worcester Polytechnic Institute, Robotics Dept.
Graduate Capstone Project, Reversing Autonomous Tractor Trailer **Jan 2019 – May 2019**
Team project to develop an autonomously reversing tractor trailer utilizing machine vision, 3D simulation, and inverse kinematics to simulate automated reversing up to a loading bay.

University of Wisconsin - Madison, NEEP Dept., Madison, WI
Graduate Research Assistant, PEGASUS Toroidal Plasma Experiment **Aug 2013 – Dec 2014**
Altium design and layout of FPGA twisted pair interconnect boards for signal noise filtering of a high power magnetic system.

Published Robots

[1] "Generic Quest Giver", Twitter: https://twitter.com/QuestGiverBot. Source: https://github.com/reakain/QuestGiver. Nov. 2019.

[2] "Tarot Reader", Twitter: https://twitter.com/TarotReaderBot1. Source: https://github.com/reakain/TarotReader. Nov. 2019.

[3] "Storyteller", Twitter: https://twitter.com/BotStoryteller. Source: https://github.com/reakain/StoryTeller. Nov. 2019.

Conference Publications

[4] **Preston, R.C.**, Fitter, N.T. "Increasing personalization in long-term interactions with a workplace companion robot." *Proceedings of the Lifelong Learning and Personalization in Long-Term Human-Robot Interaction (LEAP-HRI) Workshop,* **ACM/IEEE International Conference on Human-Robot Interaction (HRI).** Boulder, Colorado, USA. March 2021.

[5] **Preston, R.C.**, Bongard, M.W., Fonck, R.J., Lewicki, B.T. "Magnetics and Power System Upgrades for the Pegasus-U Experiment." (poster) **56th Annual Meeting of the APS Division of Plasma Physics.** New Orleans, Louisiana, USA. October 2014.

Other Publications

[6] **Preston, R.C.**, Drop. Short Story, Amazon Kindle Select. July 2018.

Media Coverage

[7] Morrow, J. "Engineers earn national kudos for creating nuclear fuel assembly model" **Tri-Cities Area Journal of Business** July 2018. https://www.tricitiesbusinessnews.com/2018/07/framatome-award/.

Engineering Teaching

Oregon State University **Fall 2021**
Dept. of Mechanical Engineering **Summer 2022**
ME 351, Introduction to Instrumentation and Measurement Systems
Function, operation, and application of common mechanical engineering instruments, measurement principles, and analysis labs, grading, troubleshooting, and exam question generation

University of Wisconsin-Madison **Fall 2013**
Dept. of Engineering Physics **Spring 2014**
EMA 201, Statics
Engineering Statics recitation lectures, exam creation, and grading

Oregon State University **Fall 2011**
Dept. of Electrical & Computer Engineering **Winter 2012**
ENGR 201, Electrical Fundamentals I **Spring 2012**
Analysis of linear circuits, circuit laws and theorems, DC responses of circuits, operational amplifier characteristics and applications, recitation lectures, **Fall 2012** **Winter 2013**

quiz creation, and grading **Spring 2013**

South Dakota School of Mines & Technology **Fall 2010**
Dept. of Physics
PHYS 111L, Introduction to Physics I Laboratory
Algebra level fundamental physics concepts

Computing Skills

Languages	C#, Qt, bash/csh, C++, FORTRAN, Python, XML, CSS, Javascript, R, Lua
Build Systems	make, CMake, automake
Databases	MySQL, SQLite, SQL Express
Version Control	git
Physics Engines	Unity, Godot, MCNP, RELAP
Other Development Tools	ROS, Docker, LabView, LaTeX, Mathematica, MatLab, TIA Portal
3D CAD Tools	Autodesk Inventor/Fusion360, SolidWorks, Blender, 3ds Max, StarCCM+
2D CAD Tools	AutoCAD, Altium, Fritzing, Inkscape

Hardware Skills

Shop Tools	mill, lathe, table saw, various power tools/saws
Electronics	soldering, oscilloscope
Other Tools	FDM 3D printers, laser cutter
Metalwork	blacksmithing, welding
Plastics	casting and molding

Professional Service

Faculty Relations Officer, Robots Graduate Student Association, OSU	**2022–Current**
Graduate Mentor, NSF Research Experiences for Undergraduates, OSU	**Summer 2022**
Team Mentor, EECE Senior Capstone Program, OSU	**2020–2021**
Chair, Framatome-Lynchburg Chapter, NAYGN	**2018–2019**
Vice Chair, Framatome-Lynchburg Chapter, NAYGN	**2018–2018**
Advocacy Chair, Framatome-Richland Chapter, NAYGN	**2017–2018**
Member, Framatome-Richland Chapter, NAYGN	**2015–2017**
Member, American Nuclear Society	**2009–2017**
Member, Enlight Computer Projects, University of Wisconsin-Madison	**2013–2014**