Sean Timothy Sylwester

Address: 920 NW 28th ST, Corvallis Oregon, 97330
Website: web.engr.oregonstate.edu/~sylwests/
E-mail: sylwests@oregonstate.edu
Cell Phone: 541-954-6346

Education:

Oregon State University – Corvallis, Oregon
Honors Bachelor of Science: Sep 2014 – Jun 2018
Majors: Electrical & Computer Engineering (3.96), Honors Scholar (3.94)
Minors: Computer Science (3.92), Mathematics (3.96)
Cumulative GPA: 3.95

Oregon State University – Corvallis, Oregon
MS: Jun 2018 – Dec 2020; PhD: Jan 2020 – Jun 2023
Master's Thesis: Co-adaptive Learning and Action Selection for Heterologous Control of a Continuous-Output Myoelectric Prosthesis
Major: Electrical & Computer Engineering
Cumulative GPA: 3.94

Work Experience:

Amorphyx Inc. – Corvallis, Oregon
Student Employee: Jul 2016 – Jun 2018
- Ran the electrical test workcell, which involved improving the efficiency and accuracy of existing tests, developing new tests, and scheduling the completion of required testing.
- Developed analog SPICE simulations to explore device performance in different configurations, and response to various parasitics.
- Designed Flexible Printed Circuits and device prototyping layouts.
- Wrote programmatic layout scripts to improve design efficiency.
- Built reference CAD models for process and test machines.

Oregon State Department of EECS – Corvallis, Oregon
Undergraduate Teaching Assistant: Jan 2016 – Jun 2018
Graduate Teaching Assistant – Sep 2018 – Mar 2019
- Responsible for teaching, supervising, testing, and grading several lab sessions per term
- Collaborated with the TA coordinator and course instructors to improve lab curriculum, including rewriting a lab manual and updating lab materials.
- Won the College of Engineering's Graduate Teaching Assistant of the Year Award for 2019
Graduate Research Assistant: Jun 2018 – Sep 2018, Mar 2019 – Present
- Member of the OSU Information Processing Group under Dr. V John Mathews.
- Serve as a mentor for several undergraduate students in the group

Relevant Knowledge:

Languages
Fluent: English, French
Basic: Russian
Programming Languages
Proficient: C, C++, Python, MATLAB
Basic: Java, Javascript
Software Skills – Microsoft Office, JMP, MATLAB, Mathematica, Solidworks, EAGLE, SPICE, LaTeX
Hardware Skills – Oscilloscope, Function Generator, Soldering

Graduate Research Work:

- My research area is in neural decoding for myoelectric prostheses – advanced prosthetic limbs controlled by the electrical signals generated during muscle contraction.
- My focus is on improving the efficiency of the training process by using active learning techniques to better train the human subject to use the prosthesis, and by optimizing online neural network updates to account for changes in the human's behavior during training.
- Since beginning graduate work, I have developed a complete data collection, analysis, and decoder testing system for myoelectric prostheses integrating the following components:
  - OpenBCI Cyton biosensing board to stream real-time electromyography (EMG) data,
  - Discrete-time filters for preprocessing the EMG data,
  - Custom-made sensorized glove that continuously measures finger position
  - Python implementation of the Kalman Filter and various Neural Network machine learning algorithms, trained to decode movement intent from EMG data,
  - MuJoCo physics simulator for real-time visualization of predicted hand movements with a virtual hand,
  - Python TkInter GUI
- I have run many hours of testing sessions with volunteers in this IRB-approved research.

Undergraduate Senior Design Project:

- Our *Navigation Assistance for the Vision Impaired* project consisted of a headband with ultrasonic and laser Time of Flight sensors to sense obstacles in the environment, and a waistband with button-cell haptic feedback motors to indicate the distance and direction of the user to those obstacles.
- I was personally responsible for all the code, PCBs, and circuit design

Clubs / Activities

- **OSU Audio Engineering Club** – Designing, building, and testing audio equipment (mixers, equalizers, effects, etc.) circuit schematics and PCB layouts.
- **OSU Solar Vehicle Team** – Helping to design, build, and test the body design, battery, and electrical systems for OSU's solar racecar.

References:

V John Mathews – Professor
Oregon State University Department of Electrical and Computer Engineering
Phone: (541) 737-1144
Email: mathews@oregonstate.edu
My graduate school advisor.

Sean Muir – VP of Device Technology
Amorphyx Inc.
Phone: (541) 250-0702
Email: smuir@amorphyx.com
My boss during my internship at Amorphyx Inc.

Matt Shuman – Instructor
Oregon State University Department of Electrical and Computer Engineering
Phone: (541) 737-1072
Email: shuman@eecs.oregonstate.edu
My undergraduate TA coordinator and instructor.