

EMILY ALLEN

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Dedicated, enthusiastic individual with strong technical, intrapersonal, and project management skills and a passion for teaching.

TEACHING EXPERIENCE

SPRING 2020

COURSE INSTRUCTOR – DYNAMICS (ME 212), WSU

Presented lectures, conducted learning assessments, and facilitated active learning both face-to-face and online via Zoom for class of 75 students.

SPRING 2020

PROGRAMMING TUTORIAL DESIGNER – MECHATRONICS (ME 401), WSU

Designed supplementary tutorials and facilitated workshops for programming in C/C++ for Arduino.

SUMMER 2019

SUMMER COURSE INSTRUCTOR – DYNAMICS (ME 212), WSU

Prepared materials, presented lectures, assigned practice problems, and conducted learning assessments for class of 20 students.

SUMMER 2019

SUMMER COURSE INSTRUCTOR – THERMAL/FLUIDS LAB (ME 306), WSU

Presented lectures, supervised experiments, and graded assignments for class of 8 students.

SPRING 2019

GRADUATE TEACHING ASSISTANT – THERMAL/FLUIDS LAB (ME 306), WSU

Supervised experiments, clarified report guidelines, explained equipment, graded reports.

SUMMER 2018

LEARNING MODULE DESIGNER – SOFT ROBOTICS, WSU

Developed learning modules to introduce students of all ages to topics of design, fabrication, and evaluation of soft and tunably compliant robotics.

FALL 2017

LAB TEACHING ASSISTANT – CALCULUS II (MATH 172), WSU

Presented lectures, graded assignments, answered questions.

2014 – 2016

PEER TUTOR – STEM SUBJECTS, CENTRALIA COLLEGE

Tutored students in calculus, physics, chemistry, and other engineering courses.

SPRING 2016

TRIO TUTOR – MATH & ENGLISH, CENTRALIA COLLEGE TRIO PROGRAM

Provided tutoring for college students from disadvantaged backgrounds.

PROFESSIONAL EXPERIENCE

2018 – 2020

GRADUATE RESEARCH ASSISTANT – M3 ROBOTICS LABORATORY, WSU

Mathematical modeling/design of smart material structures for tunably compliant soft robotics.

2017 – 2018

STUDENT AMBASSADOR – COLLEGE OF ENGINEERING AND ARCHITECTURE, WSU

Represented engineering college to industry representatives, alumni, and prospective students.

SUMMER 2017

MECHANICAL ENGINEERING INTERN, HARGIS ENGINEERS INC.

Designed/modeled HVAC and plumbing systems for new Seattle schools.

SPRING 2017

UNDERGRADUATE RESEARCH ASSISTANT – NOME LABORATORY, WSU

Researched immobilization of radioactive iodine in ceramic materials.

SPRING 2016

VOLLEYBALL COACH, CENTRALIA MIDDLE SCHOOL

EDUCATION

MAY 2020

WASHINGTON STATE UNIVERSITY

MASTER OF SCIENCE, MECHANICAL ENGINEERING – 3.91 GPA

Thesis in variable stiffness structures for soft robotics

MAY 2018

WASHINGTON STATE UNIVERSITY

BACHELOR OF SCIENCE, MECHANICAL ENGINEERING – 4.00 GPA

Minor in Materials Science and Engineering

JUNE 2016

CENTRALIA COLLEGE

ASSOCIATE IN SCIENCE, MECHANICAL ENGINEERING EMPHASIS – 4.00 GPA

ASSOCIATE IN ARTS – 4.00 GPA

PROJECTS

FALL 2019

Implemented **convolutional neural network** to identify 3D configuration of soft robotic element from a single camera view using machine learning in MATLAB.

FALL 2019

Designed maneuverable **pneumatic soft actuator** driven by intrinsic shape memory alloy springs.

SPRING 2018

Built and programmed robot capable of scanning pillars, sensing colors, parking in designated locations, and making logic-based decisions.

SPRING 2018

Performed **vibration analysis** on helicopter armor panel and redesigned linkages to withstand vibration spectrum and comply with military standard.

FALL 2018

Modeled configuration of soft robotic element with selectable bending axes; developed relationships between configuration and tendon forces based on material properties and selected axes.

SPRING 2017

Designed and fabricated adjustable gear assembly to increase speed of line-tracking robot.

TECHNICAL SKILLS

- Microsoft Office – highly proficient
- MATLAB – highly proficient
- Revit MEP – proficient
- AutoCAD – basic user
- Blackboard – proficient
- Lab instrumentation – proficient

SOFT SKILLS

- Positive work ethic
- Strong technical and written communication skills
- Ability to design and develop curriculums
- Leadership and teaching experience
- Organizational skills

CERTIFICATIONS

- Certified SOLIDWORKS Professional (CSWP)
- Certified Engineer in Training (EIT)

LANGUAGES

- **English** – native speaker
- **Spanish** – proficient speaking, reading, writing

PUBLICATIONS AND CONFERENCE PRESENTATIONS

- E. A. Allen, B. C. Townsend, and J. P. Swensen, “Configuration Modeling of a Soft Robotic Element with Selectable Bending Axes,” in Proc. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2019)*, Macau, China, Nov. 2019.
- E. A. Allen and J. P. Swensen, “Versatile Layering Approach to Pneumatic Soft Actuator Fabrication,” in Proc. *ASME 2019 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS2019)*, Louisville, KY, 2019, p. V001T01A001.
- E. A. Allen, L. D. Taylor, and J. P. Swensen, “Smart material composites for discrete stiffness materials,” *Smart Materials and Structures*, vol. 28, no. 7, p. 074007, Jun. 2019.
- E. A. Allen and J. P. Swensen, “Directional stiffness control through geometric patterning and localized heating of fields metal lattice embedded in silicone,” *Actuators*, vol. 7, no. 4, p. 80, Nov. 2018.
- E. A. Allen, L. D. Taylor, and J. P. Swensen, “Smart material composites for discrete stiffness materials,” in Proc. *ASME 2018 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS2018)*, San Antonio, TX, 2018, p. V002T06A015.

HONORS AND AWARDS

OUTSTANDING SENIOR IN MECHANICAL ENGINEERING, WSU, 2018

OUTSTANDING JUNIOR IN MECHANICAL ENGINEERING, WSU, 2017

PRESIDENT'S HONOR ROLL, WSU, 2016-2018

THEODORE D. HARRINGTON SCHOLARSHIP, NATIONAL ASSOCIATION OF CORROSION ENGINEERS (NACE), 2017

MORROW SCHOLARSHIP, SOCIETY OF MANUFACTURING ENGINEERS, 2017

OUTSTANDING STUDENT AWARD, CENTRALIA COLLEGE, 2016

Exceptional academic achievement and community involvement.

ALL-USA COMMUNITY COLLEGE ACADEMIC TEAM GOLD SCHOLAR, COCA COLA, 2016

Outstanding academic achievement and leadership accomplishments.

Selected as 1 of 40 gold scholars in the nation.

FORD MOTOR COMPANY SCHOLARSHIP, SOCIETY OF WOMEN ENGINEERS (SWE), 2016

REFERENCES

- **Arda Gozen** | WSU Assistant Professor in mechanical engineering | arda.gozen@wsu.edu | (509) 335-3214
- **Becky Dueben** | WSU Tutor Director & Special Projects Liaison | rdueben@wsu.edu | (509) 335-0348
- **John Swensen** | WSU Graduate research advisor/Committee chair | john.swensen@wsu.edu | (509) 335-1031
- **Brian Cannon** | Hargis Engineers Associate Principle, Mechanical | brian.cannon@hargis.biz | (206) 218-8373