

Umair Sarwar

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EDUCATION

Purdue University • West Lafayette, IN

Jan '18-Dec '23

Direct Philosophy of Doctorate Candidate (DPhD.) Mechanical Engineering, REID Lab

GPA: 3.69/4.0

Research Focus: Human Machine Interactions in design of engineering products (autonomous cars)

Coursework: Reliability Based Design, Product and Process Design, Analysis and Design of Robotic Manipulators, Manufacturing and Process Engineering, Machine Learning, Refrigeration and Compressor Technology, Educational Software Design, Statistical Methods, Math's for Engineers

Purdue University • West Lafayette, IN

Aug '14-Dec '17

B.Sc. Mechanical Engineering (Manufacturing and Design).

GPA: 3.69/4.0

Study Abroad to **Universite de Perpignan** for June 2016. Studied Biomaterials for Implant Devices

Honors: Deans Honors List (All Semesters)

Publications: "Maker-A Game to Engineering" ASEE '16 Conference .(www.asee.org/public/conferences/64/papers/16792/view)

TECHNICAL SKILLS

Machining: Laser Cutter, 3-D Printer, Press, Lathe, Mills, Vacuum Thermoforming, CNC, Freeform Fabrication, Rapid Prototyping

Software: CATIA V5 , Solid works, AutoCAD, LabVIEW, MATLAB, C++, Python, MasterCAM(CNC) , iMotions ,NIRxLab

WORK EXPERIENCE

Graduate Research Assistant Purdue Graduate School • West Lafayette, IN

Jan'18 – Present

- Making use of psychophysiological sensors like EEG, fNIR, Shimmer, GSR to study the human machine interactions
- Focused on understanding the relation between workload and trust in autonomous vehicles and their algorithms
- Running a study currently to understand how much humans trust the algorithm of an autonomous car and when do the trust levels start to change using fNIR (Functional Near Infrared Spectroscopy)
- Trying to understand the reasons behind the change in trust level and the workload associated so the algorithms of a Level 2-3 autonomous car can be improved for greater safety
- Mentoring two undergraduate students to train them towards doing a good literature research and using psychology to understand the analyzed data

Head Teaching Assistant Purdue Graduate School • West Lafayette, IN

Aug'18 – Present

- In charge of making lab plans and weekly slides for the "Engineering Design for Sophomore" course
- Delegate and coach a staff of about 16-20 people in weekly meeting to get them prepared for the labs
- Ensure smooth running of the 15 labs with about 270 students
- Provide technical training to TA's and lab staff on getting prepared for assisting students on lathes, mills and 3D printers

Graduate Teaching Assistant Purdue Graduate School • West Lafayette, IN

Jan '18 – May'18

- In charge of coordinating two labs towards developing their designs and prototypes for their cornerstone design project
- Coached students on generating technical drawings and documents and provided feedback through grading.
- Helped the team develop low and medium fidelity prototypes for presentations.
- Worked as a Lab Assistant for the same class for two semesters as an **Undergraduate Teaching Assistant** (Aug '16 – Dec'17)

Summer Research Intern SURF Purdue • West Lafayette, IN

May '17 – Aug'17

- "Laboratory characterization of unsteady boundary layer turbulence and flow structure" with Dr. Cary Troy
- Produce and analyze preliminary data associated with unsteady, oscillatory boundary layers.
- In charge of designing, setting, carrying out and analyzing experiment in two large scale water flow facilities.
- Performance of measurements on turbulence and velocity structure using instruments, including acoustic Doppler profiler.

Mechanical Engineering Intern Orient Group of Companies • Lahore, Pakistan

May '16 – Jun '16

- Assisted in post assembly performance testing for refrigerator cooling rates.
- Optimization of the metal sheet departments press operation to improve daily production rate from 700-770 sheets.
- Fabricated drawings on AutoCAD for bottom plate(GI) and midbeam plate(VCM) for a new model of refrigerator.
- Operated vacuum thermoforming machines for development of 4 types of HIPS body liners.

Undergraduate Research Assistant FACELab Purdue • West Lafayette, IN

Jan '15 – Aug '16

- Identifying techniques to inculcate humanistic approach to engineering design process with a focus on minorities and women.
- Researched the link between theories of maker space development to the different engineering design processes.
- *Minority Engineering Camp 2015 and 2016-* Coached 200 students on the design process and maker space technologies.
- Led the rapid prototyping team to develop 50 prototypes in 3 days for 200 students attending the 2-week camp.

General Technician and Safety Team Purdue ASME • West Lafayette, IN

Nov '14 – May '15

- Reduced lap time by 1.4 secs on average by repositioning the engine on the chassis to improve moments.
- Developed time management and multitasking skills by working in the pit lane to change fuel tank and tires.

PROJECTS

Education Software Design

- Software for operating a physics based Haptic controller

Controls and Systems

- Autonomous Line Follower
(Winner of the ME 375 Robotics Competition)

Senior Design

- ContaBat- Data analytical and performance device cricket bats.
(2nd Position in Mallot Award)

Design

- Torsion and Bending Force Autonomous Demonstration
- Cam Design and Dynamic Force Analysis in 2 stroke engine
- Slider Crank and Gear Train Analysis of a 2 stroke engine
- Landing Gear Mechanism Optimization
- Designing a mechanism/process for extracting a certain material from amniotic fluid

LEADERSHIP & INVOLVEMENT

Captain Purdue Cricket Team • West Lafayette, IN

Oct '16 – Present

- Led a 23-man squad of people from 5 nations in the Midwest Cricket Conference.

Cultural Committee Member Purdue Student Union Board • West Lafayette, IN

Sep '15 – Mar '16

- Helped organize and plan 9 events, each attended by almost 300 people.
- Challenged ourselves to put up religious and cultural festivals from all around the globe, envisioning a united Purdue community.

President Pakistan Students Association • West Lafayette, IN

May '15 – May '17

- Planned and organized PSA events, \$5000 budget per event, to promote and showcase the culture of Pakistan.