YOUSUF ABUBAKR

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EDUCATION

University of California, Berkeley, Class of 2024 GPA: 3.9 | **August 2020 - Present**

Mechanical Engineering BS & Electrical Engineering and Computer Science Minor

Relevant Coursework: Two and Three-Dimensional CAD Modeling and FEA, MATLAB, Physics (Kinematics and Forces), Single and Multivariable Calculus, Linear Algebra and Differential Equations, Intro to Computer Science (Python),

EXTRACURRICULAR ACTIVITIES

Research Assistant | **Grace O'Connell Biomechanics Lab** Berkeley, CA | **December 2020 – Present**

- Enhanced validation of FEM bovine model by constructing 7+ experiments in FEBio (Finite Element for Biomechanics) to verify mechanical properties of model over multiple loading modalities and physical, experimental data
- Computed parameter optimization of Hydrogel/scaffold model in collaboration with i3s Institute to calculate the 3 model parameters (Young's Modulus, Poisson's Ratio, Permeability) that minimized desired displacement in biomaterials
- Modeled 4+ biphasic and triphasic tissue structures in FEBio to examine stress and strain distributions and to simulate transport of solvent, ion, and water contents in fiber-reinforced tissues
- Assembled FEA data from FEBio in MATLAB to categorize, curve-fit, and graph results of computational models

Aero and Composites Member | **CalSol, UC Berkeley Solar Vehicle Team** Berkeley, CA | **July 2020 – Present**

- Validated aerodynamic performance of solar vehicle by performing over 30+ Flow tests in ANSYS Fluent to strengthen understanding of weather conditions impact on vehicle and to forecast driving techniques in future races
- Optimized design of shell in SolidWorks by refining surface modeling of our vehicle's geometry to reach appropriate 0.00+ degree draft angles to prepare for molding and manufacturing of exterior shell for vehicle
- Parameterized enclosure size and mesh refinement to evaluate impact of modeling variables on ANSYS simulations
- Conducted 4+ PDR (Preliminary Design Reviews) with CalSol managers, alumni, and General Motor representatives

President | **VEX Robotics/Engineering Club** Peoria, AZ | **August 2018 – May 2020**

- Saved school over $3000 dollars by designing, producing, and placing teachers' names on their doors in paper textiles
- Placed in top 10% for all Arizona VEX teams for VEX Robotics at state competition
- Advised CAD Assembly team, who was tasked with recreating robot in a 1-to-1 assembly in SolidWorks
- Designed and constructed over 20 custom Corn Hole Boards for school-related and independent consumers

WORK EXPERIENCE

Network Engineering Assistant | **STS (Student Technology Services)** UC Berkeley | **October 2020 – Present**

- Wrote and programmed 3+ Python scripts and templates to expedite data collection process in Excel documents
- Renewed network switches and access points in 150+ ports in university housing to sustain ethernet connection systems

SLC Math Tutor | **SLC (Student Learning Center)** UC Berkeley | **January 2021 – Present**

- Backed up professor instruction by creating custom practice questions to reinforce lecture topics and review concepts
- Spearheaded group tutoring sessions of 4+ to help students struggling in similar areas in single-variable calculus

PROJECTS

CFD Review | **CalSol, UC Berkeley Solar Vehicle Team** UC Berkeley | **March 2021 – May 2021**

- Collaborated with classmate to examine impact of 20 m/s wind speeds and and 0-35 degree direction angle for winds flowing against the motion of our solar vehicle to make recommendations for future vehicle designs
- Meshed shell model, defined solution domain, and conducted flow simulations in ANSYS to imitate wind scenarios
- Concluded that major forces at play (drag, lift, side-force, torque) all peaked and flow separation was most common at ~25 degree crosswinds, which corresponds closely with other studies

HONORS AND AWARDS

- NSF REU (National Science Foundation Research Experience for Undergraduates) Grant **April 23, 2021**
- CSWA (Certified SolidWorks Associate) Certification (Certification Number: C-SHL4RND67P) **November 16, 2019**
- NSLI-Y (National Security Language Initiative for Youth) in Amman, Jordan from US State Department **March 29, 2019**

SKILLS AND INTERESTS

- **Engineering/Computer Applications:** SolidWorks (proficient), MATLAB (proficient), ANSYS Fluent (proficient), FEBio (proficient), ANSYS (competent), Paraview (competent), Python (competent), Excel (competent)
- **Languages:** Arabic (conversational), Spanish (conversational)
- **Interests:** Avid Basketball Fan (#DontSleepontheSuns), Casual Movie and TV Reviewer, Ardent Minecraft Enthusiast