Xhulja Biraku
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EDUCATION

University of Michigan, Ann Arbor, MI Expected: *May 2024*
Mechanical Engineering PhD Candidate GPA: 4.00

University of Michigan, Ann Arbor, MI *May 2021*
MEng Manufacturing Engineering GPA: 3.95

University of Michigan, Ann Arbor, MI *May 2020*
BSE Mechanical Engineering GPA: 3.3

WORK EXPERIENCE

Ford Motor Company and University of Michigan, Ford Alliance Project Ann Arbor, MI
Research Assistant *May 2020 – Present*

- Researched the ability of plants to uptake nanocellulose nanoparticles to improve the mechanical properties of fibers, advancing natural fiber composites in high volume production of structural parts
- Designed and executed customized plant experiments in growth chambers, aligning with specifications provided by Ford R&D, to prove the ability of plants to uptake nanoparticles
- Analyzed and graphed data of confocal microscopy tests of plant stem samples using ImageJ, testing for increased nanocellulose uptake and creating intensity spectrum graphs
- Performed LRwhite embedding sample preparation fixation for ultramicrotome sectioning to achieve a sample thickness of 80nm, allowing the sample to be stained with toluidine blue dye and used under light microscopy
- Interpreted data regarding the morphology of the stem cell wall using transmission electron microscopy and light microscopy, verifying whether there is an increase in cell wall thickness due to exposure to nanocellulose nanoparticles
- Extracted RNA from stem samples to fabricate complementary DNA and perform RT-qPCR testing, observing variations in cellulose synthesis in control and nanocellulose samples
- Created composites consisting of flax natural fibers and completed tensile, compression, 4-point bending characterization tests to validate mechanical properties

BASF Corporation, Composite Technologies Department Wyandotte, MI
Application Development Engineer Intern *May 2019 – May 2020*

- Co-led a team on sustainable composite material applications such as 100% green sandwich composites to reduce carbon dioxide emissions from automotive practices
- Utilized bamboo as the structural natural fiber to manufacture load floor and backseat composite of a car, resulting in three prototypes used for testing
- Conducted characterization tests (tensile tests, 3 and 4-point bending tests) to determine the material properties of the prototype, discovering that green composites can substitute glass fiber composites.
- Identified the business aspects of introducing lower cost and green automotive parts in the market, enabling automakers to comply with CAFÉ and CO_2 standards by 2030.

University of Michigan, College of Engineering Ann Arbor, MI
Research Assistant *January 2019 – May 2020*

- Examined natural fibers extraction processes and compared their quality to engineered fibers, aiming to manufacture more efficient and environmental-friendly automotive parts
- Extracted natural fibers from bamboo culms to better understand the mechanical properties of the fiber, resulting in the manufacturing of thermoset and thermoplastic composite materials.
- Performed characterization tests and microscopic analysis on matrices consisting of hemp, bamboo, and glass fibers to compare their tensile strength, discovering that bamboo is of comparable strength and a viable substitute.
- Participated and presented posters at the 2019 ACCE Conference organized by the Society of Plastics Engineers, Novi, MI

TECHNICAL PROJECTS

University of Michigan, Ross School of Business *September 2020 – December 2020*

- Valued standard securities such as bonds and stocks with Excel spreadsheets, leading to comprehension of financial practices

University of Michigan, College of Engineering *September 2018 – December 2018*

- Developed Arduino program for decision-making process of four-bar linkage, utilizing Red-Green-Blue sensor to sort colored objects and deposit them into their corresponding baskets.
- Designed four-bar linkage using SolidWorks and simulated its dynamic model using ADAMS, resulting in optimization of device

ADDITIONAL SKILLS

Awards: Rackham Merit Fellowship
Software: SolidWorks, Microsoft Office, Minitab, ANSYS 2020 R2, ImageJ, Prism-GraphPad
Languages: English (fluent), Greek (native), Albanian (native)