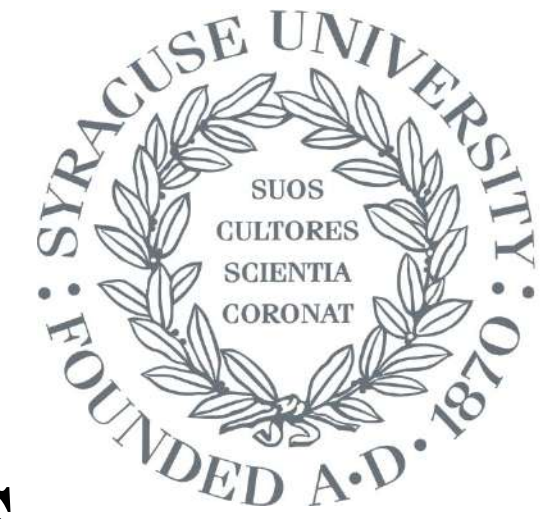




Acoustic Management Panels

Project Description:

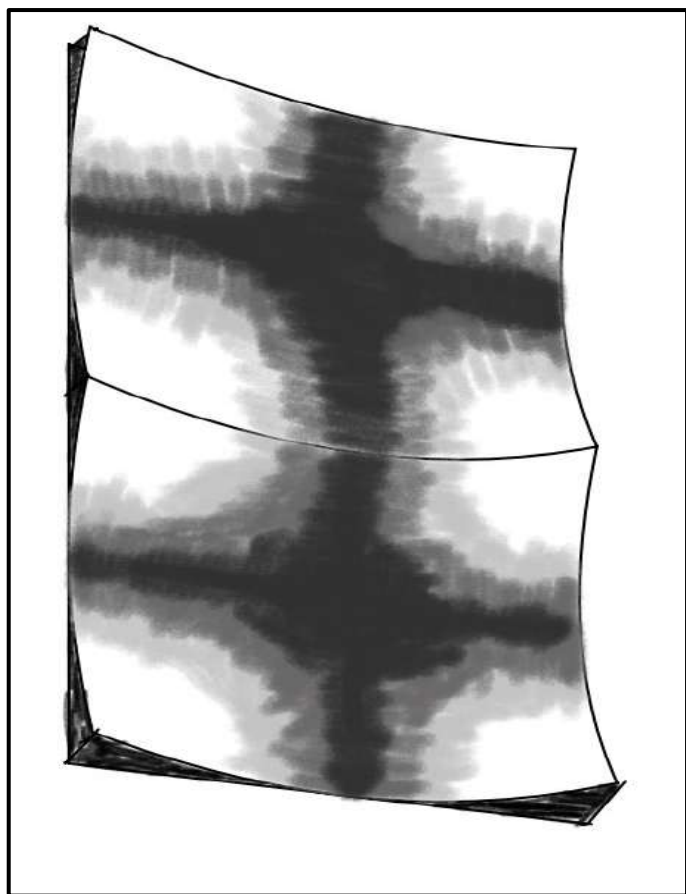
This year our team is working with DuPont, a multinational chemical company based in Delaware. They are seeking to develop acoustic management panels using its signature product, Corian® Solid Surface. Corian® Solid Surface is a hard, non-porous material that can be shaped using thermal molding, routing, and cutting techniques. Since the material primarily reflects sound, DuPont wants to design panels that can dampen, deflect, and focus sound waves. The Syracuse team will collaborate with DuPont to develop nine innovative sound-control designs, grouped into three designs for each category. Each design will feature unique geometries while using the same high-quality materials, ensuring they meet performance standards and remain competitive in the acoustics market.

Corian® Solid Surface Applications:

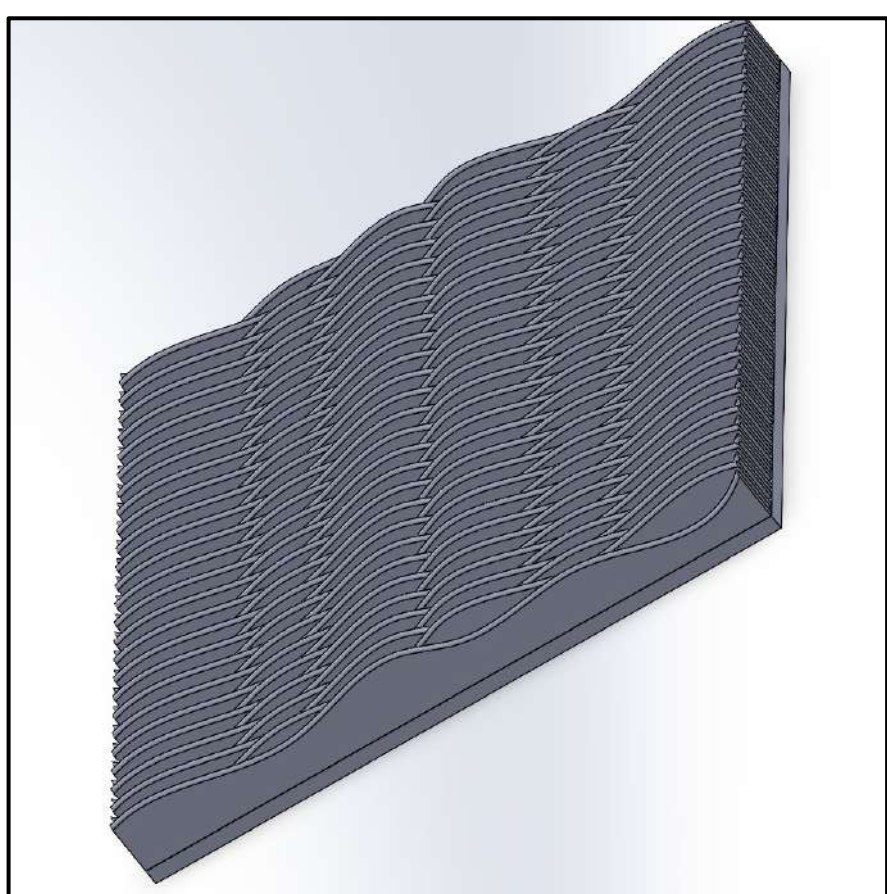


Early Design Concepts:

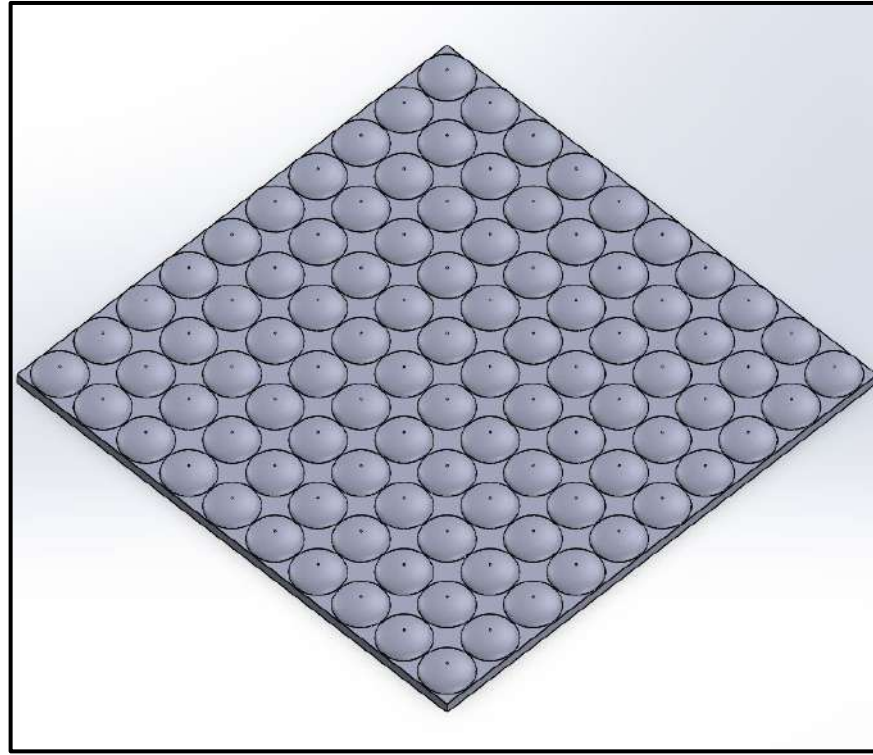
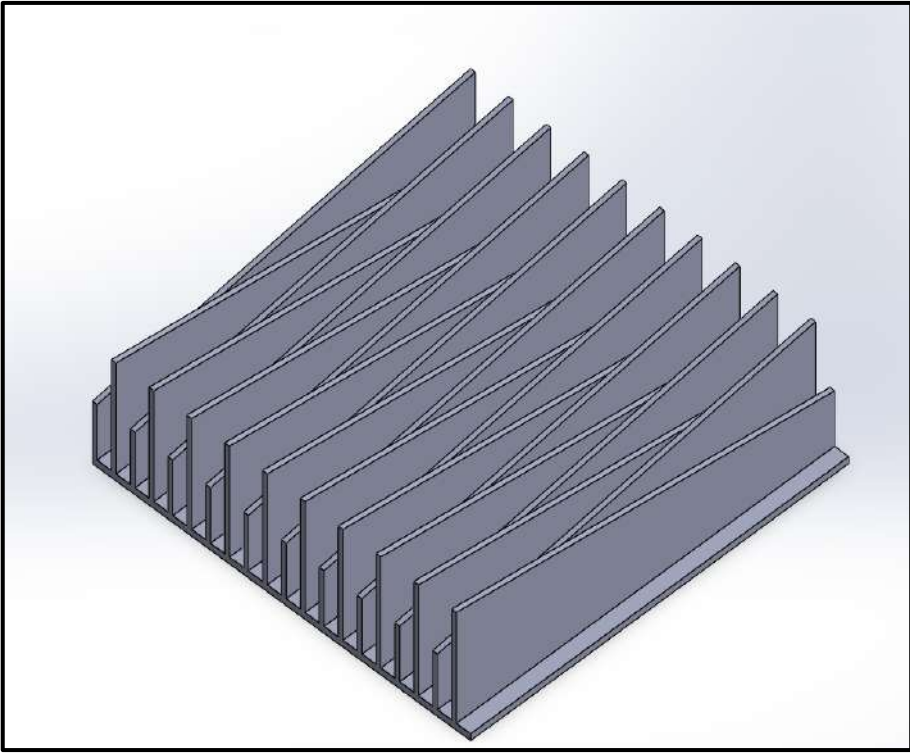
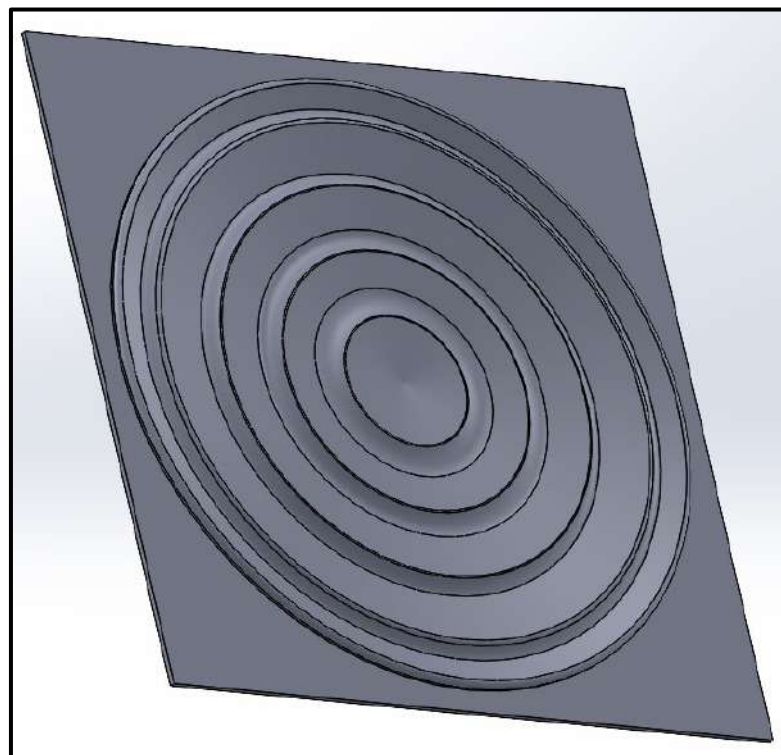
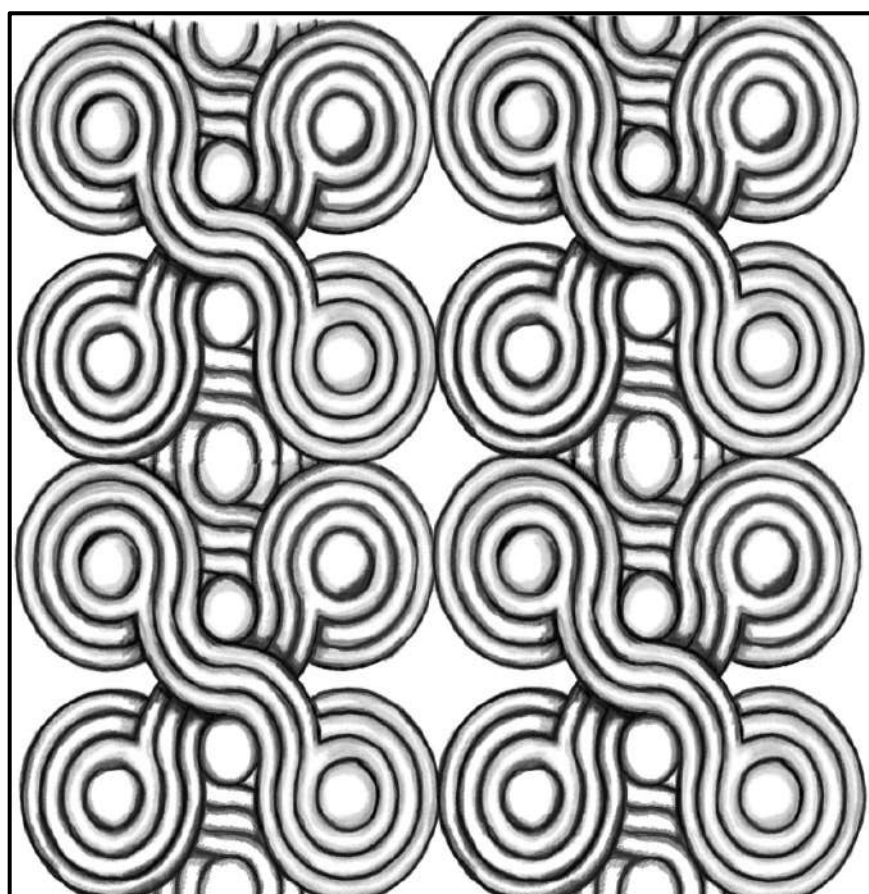
Focusing:



Dampening:



Diffusing:



Simulation testing:

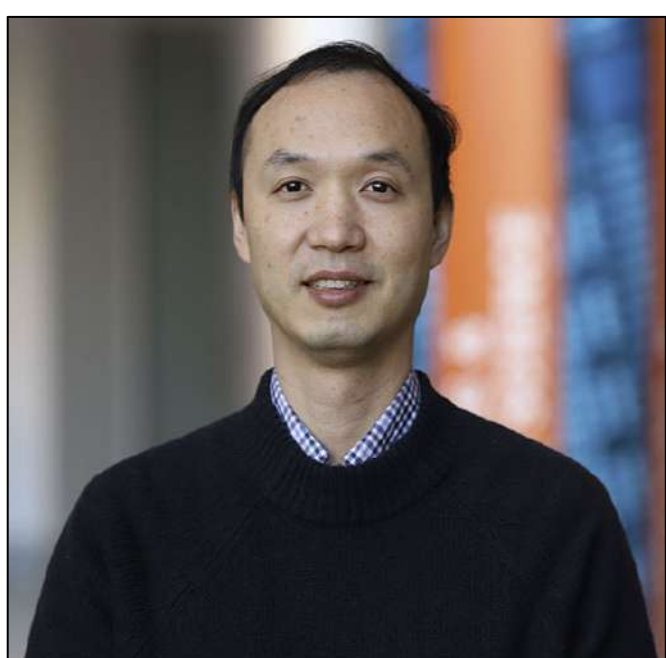
To test our early design concepts, we will use ANSYS and ODEON acoustic simulations. By integrating our CAD models, we can measure key acoustic parameters such as noise reduction coefficient (NRC), sound absorption coefficient, and sound transmission loss (STL). These simulations will reveal how each design focuses, diffuses, or dampens sound, helping us refine geometries and select the best candidates for prototyping based on their acoustic performance in various environments.

Real-World Testing:

We plan to refine our designs using Syracuse University's anechoic chamber, where we can test prototypes by arranging panels in a controlled space and converting reflected sound waves into electrical signals. Additionally, we will mount panels on a wall and direct sound toward them, using an array of microphones to capture real-time data on how effectively the panels focus, diffuse, or dampen sound. This will help us evaluate the panels' overall performance in achieving the desired acoustic outcomes.

Project Deliverables:

1. Identify building codes related to sound control, summarize testing methods, and provide performance ratings
2. Fully characterize the Corian® Solid Surface acoustic properties (such as Sound Absorption Coefficient and reflection)
3. Completing the designs that integrate Corian® Solid Surface properties to control sound
4. Build three prototypes as well as testing them in relevant industry methods
5. Document the design fundamentals along the way, to better control acoustics with the Corian® Solid Surface panels.



Faculty Mentor:
Dr. Thang Zang



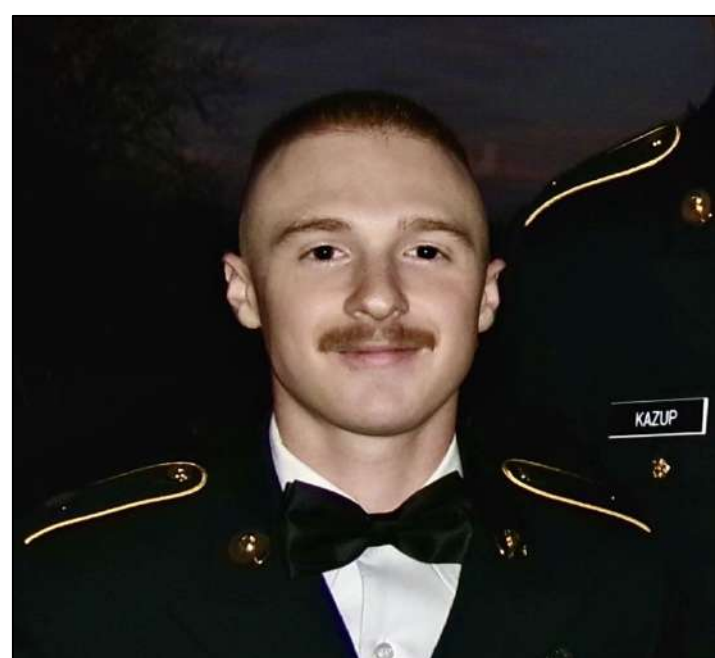
Winston Chilson



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Mirnes Osmanovic



Jackson Wicks