

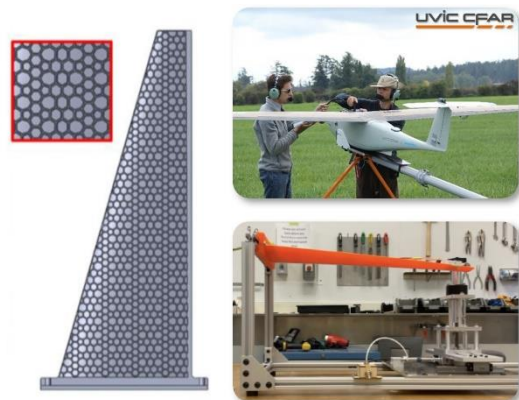
Opportunity: MASC Student in Mechanical Engineering

Experimental and Computational Mechanics of Additively-Manufactured Architected Materials for Lightweight Airplane Wing Design

Professors Dr. Bosco Yu and Dr. Afzal Suleman, at the Department of Mechanical Engineering at the University of Victoria (UVic), are seeking to hire a **MASC student** to support a project on the experimental and computational mechanics of architected materials for lightweight airplane wing design. This will be a collaboration between the University of Victoria’s Hybrid 3D research lab (H3D) and the Centre for Aerospace Research (CfAR).

Project context:

The recent emergence of additive manufacturing (AM), Industry 4.0, and rapid prototyping has caused a paradigm shift in the design philosophy in engineering. Rapid prototyping processes allow for the development of porous architected materials with tunable internal architecture that can be customized for a specific engineering application. Dr. Yu’s Hybrid 3D research group has been designing lightweight architected materials for many years. Our recent research demonstrates that some unique designs of 3D-printed honeycomb panels (a type of architected materials) can lead to substantial improvement in strength and damage tolerance without a weight penalty.



This improved performance and weight reduction is especially attractive for aircraft structures, particularly in airplane wing design. Meanwhile, Dr. Suleman’s group (CfAR) has been collaborating with industry and government research centers on researching the topology optimization of aerospace structures for the last 20 years, e.g. optimizing wing aerodynamics and structure. Together, Dr. Yu and Dr. Suleman will supervise a MASC candidate to utilize the design in architected materials to develop a high-stiffness lightweight wing design to reduce fuel consumption and minimize wing vibration.

Skills and Background of Candidate:

You are an individual who can work independently and has the ability to adapt and overcome the challenges and uncertainties that are typically associated with research & development. You are passionate about materials development, solid mechanics, and aircraft design.

Technical Skills	Non-Technical Skills
<p><u>What is required:</u></p> <ul style="list-style-type: none"> • Have research/extracurricular/work experience related to aircraft design. • Demonstrated background in Finite Element Modeling (FEM). 	<p><u>What is required:</u></p> <ul style="list-style-type: none"> • Fluent in English. • Strong communication skills, both oral and written.

- Demonstrated experience in CAD and designing mechanical systems.
- Strong understanding of solid mechanics.

What is desired:

- Demonstrated experience in using engineering standards to perform mechanical testing.
- Interest in topology optimization.
- Interest in Aerospace Engineering.

- Evidence of commitment and openness to training, learning and discussion.
- Evidence of strong work ethic (e.g. exceeding expectations, going above and beyond assigned duties, demonstrating initiative).
- Demonstrated ability to work independently and as part of a team.

What is desired:

- Demonstrated professional communication with supervisor and collaborators.
- Have published research papers or authored technical reports.

Why you should join us:

You will have the opportunity to further your academic experience and qualifications, and to learn from two highly qualified professors at UVic. The research work is related to green technology in the aviation sector. The position is funded at a level comparable with NSERC scholarships, and top-up funding is available to those with scholarships. You will have exciting opportunities to apply your research to a real-world problem and collaborate with industry partners. The Hybrid 3D research group and CfAR are located in Victoria on the traditional territory of the Lək̓ʷəŋən and WSÁNEĆ peoples, among the beautiful landscapes of British Columbia; a wonderful place to live and learn!

How to apply?

Fill in the following form (not by email): <https://www.hybrid3dlab.com/apply>

Closing Date: The search will continue until the position is filled (at which time the above form will be closed)

Expected Start Date: September 1st, 2024