

Opportunity:

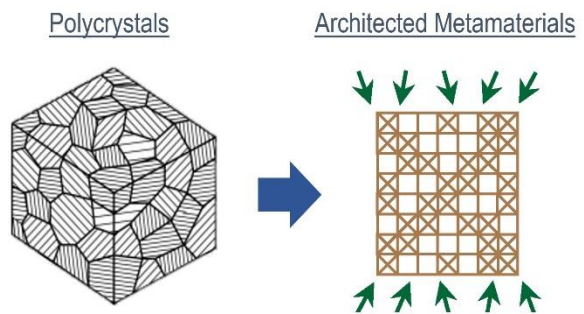
MASc Student in Mechanical Engineering

Project title: Development of Parametrized CAD Design Software for Nature-Inspired Architected Metamaterials in Additive Manufacturing

Professor Dr. Bosco Yu at the Department of Mechanical Engineering at the University of Victoria (UVic), is seeking to hire a **MASc student** to support a project on computational simulation and parameterized CAD design of 3D printable architected metamaterials. This will be a collaboration between University of Victoria’s Hybrid 3D research lab (H3D), Dr. Antony Orth at the National Research Council (NRC), and Dr Michael Greenwood at the Natural Resources Canada (NRCan).

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 architected metamaterials with geometry mimicking natural structures such as the lattice unit cell seen in polycrystalline materials can have unique strengthening effects.



Together, Dr. Bosco Yu at UVic and his collaborators at NRC and NRCan will supervise a MASc candidate to develop parameterizable CAD algorithms for the design of 2D and 3D architected metamaterials. The project may involve utilizing crystal growth simulation to generate a spectrum of nature-inspired architected materials with different internal architectures followed by optimization for mechanical performance.

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 CAD design & software development.

Technical Skills	Non-Technical Skills
<p><u>What is required:</u></p> <ul style="list-style-type: none"> • Demonstrated experienced background in Python coding • Demonstrated experience in CAD design and software utilization 	<p><u>What is required:</u></p> <ul style="list-style-type: none"> • Fluent in English. • Strong communication skills, both oral and written.

What is desired:

- Familiarity in C/C++ coding and compiling
- Demonstrated experience in computational geometry
- Strong mathematical background
- Interest in topology optimization
- Interest in linking and automating software

- 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 a highly qualified professor at UVic. The position is funded at a level comparable with NSERC scholarships, and top-up funding is available to those with scholarships. The research work is related to additive manufacturing and Industry 4.0. You will have exciting opportunities to apply your research to a real-world problem and collaborate with industry partners. In this project, you will be closely collaborating with and building connections with scientists in two of Canada's largest government research organizations (NRC and NRCan). Finally, the Hybrid 3D research group is located in Victoria on the traditional territory of the Lək'wəŋən and W̱SÁNEĆ 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-for-a-research-position>

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