XIAO **SHANG**, **MASc, EIT**

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Education

University of Toronto — Toronto, ON, Canada

Doctor of Philosophy - Materials Science and Engineering (GPA 4.0/4.0) — *May 2021 - Present*

McGill University — Montréal, QC, Canada

Master of Science – Mechanical Engineering (GPA 4.0/4.0) — *Sep. 2015 – Sep. 2017*

South China University of Technology — Guangzhou, *China*

Bachelor of Engineering – Mechanical Engineering (GPA 3.8/4.0) — *Sep. 2011 - June 2015*

Research Experience

Lab for extreme mechanics & additive manufacturing, University of Toronto — Toronto, ON, Canada

Graduate Research Assistant (Supervised by Dr. Yu Zou)

Design and additive manufacture of high performing metallic functionally graded materials via microstructure modification — *May 2021 - Present*

- Project 1: designed and built a full directed energy deposition (DED) system.
- Project 2: created a deep-learning and genetic algorithm framework that can tailor the mechanical properties of 3D material microstructures.
- Project 3: predict the cross sections of resultant melt track, surface, and bulk material shapes via machine-learning methods to realize DED printing parameter optimization.
- Project 4: design and manufacture metallic functionally graded materials by the addition of external magnetic and/or ultrasonic vibration fields.

Architected materials and advanced structures group, McGill University — Montréal, QC, Canada

Graduate Research Assistant (Supervised by Dr. Damiano Pasini)

Durable bistable auxetics made of rigid solids — *Sep. 2015 – Sep. 2017*

- Designed a novel metamaterial, the rigid bistable auxetic metamaterials (BAM).
- Performed static and fatigue tensile tests on BAM.
- Investigated BAM properties with various material characterization techniques.

Micro engineering, dynamics and automation lab, University of Calgary — Calgary, Canada

Mitacs Globalink research intern (Supervised by Dr. Simon Park) — *June 2014 – Oct. 2014*

- Studied the effects different sand-blasted patterns have on the performance of sapphire cutting tools experimentally on a CNC machine center.

Publications and Awards

Selected publications (3 of 6**)**

Adhikari G.,…, Shang X., et al. (2021). nEXO: neutrinoless double beta decay search beyond 10^{28} year half-life sensitivity. *Journal of Physics G: Nuclear and Particle Physics*, 49(1), 015104. *2021*

Yin, Z., ... Shang. X., et al. (2021). Young martlets: Exploring the world of academia and beyond. *Matter*, 4(5), 1434-1436. *2021*

Shang, X., Liu, L., Rafsanjani, A., & Pasini, D. (2018). Durable bistable auxetics made of rigid solids. *Journal of Materials Research, 33*(3), 300-308. *2018*

Selected Patents

"Bistable Auxetics" (US20170362414). U.S. Patent and Trademark Office. *2020*

Selected Awards

***NSERC Canada Graduate Scholarships – Doctoral (CGS D)**, national award* *2023*

***Ontario Graduate Scholarship**, provincial award* *2021 and 2022*

***MITACS Globalink Graduate Fellowship**, international award* *2015*

***MITACS Globalink Research Intern Scholarship**, international award* *2014*

***Chinese National Scholarship**, national award* *2013*

Teaching Experience

MSE403 – Data Sciences and Analytics for Materials Engineers *Winter 2023*
University of Toronto | Teaching Assistant

MSE1065 – Application of Artificial Intelligence in Materials Design *Winter 2021 and Fall 2022*
University of Toronto | Teaching Assistant

Subatomic Physics Summer Lecture Series *2020-2022*
McGill University **|** Guest Lecturer

Work Experience

McGill University Montréal, QC, Canada

Research Engineer (Supervised by Dr. Thomas Brunner) *July. 2018 – May 2021*

- Designed a $150k vacuum cryogenic photon sensor testing setup to support the next- Enriched Xenon Observatory (nEXO) experiment.
- Worked intensively with 3D printing technologies including FDM, SLA, and SLM for testing and prototyping.

Lumenwerx Inc. Montréal, QC, Canada

Mechanical Engineer *Sept. 2017 – June 2018*

Extracurricular Experience

Materials Science and Engineering Graduate Students' Association

University of Toronto | President *2021 – 2022*

- Responsible for the direction and actions of the association and represent our graduate students at the Department, Faculty, and University level Councils.
- Coordinate and supervise the other members of the Executive Board within the association.

The Martlets Society

Website | Organizer and Editor-in-chief *2020 - Present*

- Work as the editor and event organizer for the Martlets Society, a non-profit academical organization. Our guest speakers are mainly professors and researchers from top Universities such as MIT, Oxford University, U of T etc.

Skills and Hobbies

Skills and software

- FEA, Mechanical design, Mechanics of materials, 3D printing, Conventional and advanced machining.
- Abaqus, COMSOL Multiphysics, Altair Inspire, Ansys, SolidWorks, AutoCAD.
- Python, Jupyter Notebook, MATLAB, C, C++, Tensorflow, Keras, Scikit-learn, Pytorch, Spyder.

Hobbies

- DIY projects, building and improving 3D printers, CNC machines and laser cutters.
- Snowboarding, hiking, music, and basketball.

Languages

- English, French, Mandarin.