Max M. Chumley

CONTACT

Max M. Chumley
Mechanical Engineering Ph.D. Student
College of Engineering
Michigan State University
428 S Shaw Lane,
East Lansing, MI 48824

E-mail: chumleym@msu.edu

EDUCATION

Michigan State University, East Lansing, MI — *Jan 2022 - present*
Ph.D., Mechanical Engineering (*in-progress*)
Advisor: Dr. Firas Khasawneh
GPA: 4.0/4.0

Grand Valley State University, Allendale, MI — *Aug 2016 - Aug 2021*
B.S.E, Mechanical Engineering
Minor: Mathematics
GPA: 3.96/4.0
Awarded excellence in a discipline in Mechanical Engineering.

RESEARCH/ INDUSTRY EXPERIENCE

Michigan State University, East Lansing, MI
Graduate Assistant — *Jan 2022 - present*
- Working as a research assistant to study nonlinear dynamical systems and chaos through applications of topological data analysis.

Grand Valley State University, Allendale, MI
Graduate Assistant — *Aug 2021 - Dec 2021*
- Studied imposter syndrome in engineering students and how a students achievements can improve this feeling.
- Provided mentorship for low income students as part of a combined degree scholarship program to provide advice and help in their courses.
- Advised groups of students working on independent design and build projects.

Teaching Assistant — *Aug 2021 - Dec 2021*
- Lead exam study sessions for an introduction to c programming course.
- Graded assignments for an introduction to c programming course.

Mechanical Engineering Co-op — *May 2019 - Dec 2020*
JR Automation - Holland, MI
- Three rotations working in different departments of the company.
- Experience running quoting meetings with engineering managers to develop pricing of automation equipment
- Detailed and checked mechanical drawing packages.
- Designed and developed concepts of factory automation machines.

Mechanical Engineering Internship — *May 2018 - Aug 2018*
inFORM Studio - Northville, MI
- Designed HVAC, and plumbing systems for buildings.
- Performed mechanical load calculations and used Autodesk Revit for design.
- Communicated with architects to effectively integrate mechanical systems into architectural models.

Mathematics Tutor — *Nov 2016 - Aug 2020*
Grand Valley State University Math Center - Allendale, MI
- Tutored students in courses ranging from beginning algebra through differential equations.

COMPUTING SKILLS

Software: MATLAB, Python, R, Julia, c, git, Slurm Parallel Computing (MPI, OpenMP), LaTeX, Inkscape, SolidWorks, Ansys Structural

Operating Systems: MacOS, Windows

PUBLICATIONS

Published Journal Articles

Myers, Audun. D., **Chumley, Max M.**, Khasawneh, Firas. A., & Munch, Elizabeth. (2023). Persistent homology of coarse-grained state-space networks. Physical Review E, 107(3), 034303.

Chumley, Max M., Yesilli, M.C., Chen, J., Khasawneh, F.A., and Guo, Y., "Pattern characterization using topological data analysis: Application to piezo vibration striking treatment." Precision Engineering 83 (2023): 42-57.

Preprint Articles

Chumley, Max M., Khasawneh, F.A., Otto, A., Gedeon, T., "A Nonlinear Delay Model for Metabolic Oscillations in Yeast Cells." arXiv preprint arXiv:2305.07643 (2023).

CONFERENCE ARTICLES

Peer Reviewed

Yesilli, M.C., **Chumley, Max M.**, Chen, J., Khasawneh, F.A., and Guo, Y., "Exploring Surface Texture Quantification in Piezo Vibration Striking Treatment (PVST) Using Topological Measures," MSEC2022-86659, Proceedings of the ASME Manufacturing Science & Engineering Conference (MSEC2022), 2022. Accepted.

PRESENTATIONS

Myers, A. D., **Chumley, Max M.**, Khasawneh, F.A., and Munch, E. (2023). "Persistent homology of coarse-grained state-space networks," SIAM-GL 2023, Michigan State University, 14 October 2023.

Khasawneh, F.A., Munch, E., **Chumley, Max M.**, Barnes, D., and Tanweer, S., "Topological Signal Processing for Dynamical Systems," SIAM-DS 2023, Portland Oregon, 15 May 2023.

Chumley, Max M., Yesilli, M.C., Chen, J., Khasawneh, F.A., and Guo, Y., "Quantifying Surface Patterns Using Persistent Homology With Application to Vibration Striking Treatment," Michigan State University Topological Data Analysis (TDA) Seminar, 30 November, 2022.

Chumley, Max M., Yesilli, M.C., Chen, J., Khasawneh.F.A., and Guo, Y., "Pattern Depth Characterization Using Topological Data Analysis: Application to Piezo Vibration Striking Treatment (PVST)," Michigan State University CMSE Data Science Student Conference (DISC), 11 November, 2022.

Yesilli, M.C., **Chumley, Max M.**, Chen, J., Khasawneh.F.A., and Guo, Y., "Exploring Surface Texture Quantification in Piezo Vibration Striking Treatment (PVST) Using Topological Measures," MSEC 2022, Purdue University, June 27 - July 1, 2022.

SERVICE/ INVOLVEMENT

- Helped build houses with Habitat for Humanity.
- Participated in Juvenile Diabetes Research Foundation (JDRF) One walk to raise awareness of type one diabetes.
- Volunteered at Light the Night for the Leukemia and Lymphoma Society.
- Member of Tau Beta Pi Engineering Honors Society.
- Former treasurer of Delta Tau Delta Iota Upsilon fraternity.