# MELIH CAN YESILLI

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## EDUCATION

**Michigan State University, MI, US** August 2018 - present
PhD Student, Department of Mechanical Engineering

**Middle East Technical University, Turkey** September 2013 - June 2018
Bachelor of Science, Department of Mechanical Engineering

## WORK EXPERIENCE

**Teaching Assistant** January 2019 - present
*Michigan State University*

- ME451L - Control Systems Laboratory (Spring 2019, Spring 2020)
- ME461 - Mechanical Vibrations (Fall 2020)

**Research Assistant** August 2018 - present
*Michigan State University* *Advisor: Dr.Firas Khasawneh*

- Studying data-driven analysis of complex dynamical systems and combining machine learning with tools from Topological Data Analysis to create new investigative methods to study dynamical systems.
- Investigating transfer learning performance of learned models

**Engineering Trainee** November 2017 - April 2018
*Roketsan Missiles Inc.*

- Worked in Advanced Technologies and Systems department and focused on navigation of rocket and missiles.

**Internship** June 2017 - July 2017
*Roketsan Missiles Inc.*

- Designed filters for Attitude and Heading Reference System (AHRS) and tested them on experimental data

**Internship** July 2016 - August 2016
*TEI -TUSAS Engine Industries, Inc.*

- Worked in Engine Assembly and Testing department and participated in testing of aircraft engines.

## PUBLICATIONS

### Journal Papers

- **M. C. Yesilli**, F. A. Khasawneh, and A. Otto, "On transfer learning for chatter detection in turning using wavelet packet transform and ensemble empirical mode decomposition," *CIRP Journal of Manufacturing Science and Technology,* 2019, https://doi.org/10.1016/j.cirpj.2019.11.003
- **M. C. Yesilli**, F. A. Khasawneh, and A. Otto, "Chatter Detection in Turning Using Machine Learning and Similarity Measures of Time Series via Dynamic Time Warping," *arXiv preprint:1908.01678*, 2019.(*Under review*)

- **M. C. Yesilli**, F. A. Khasawneh, and A. Otto,"Topological feature vectors for chatter detection in turning processes", *arXiv preprint: 1905.08671*, 2019. (*Under review*)

**Conference Papers**

- **M.C., Yesilli**, F. A. Khasawneh, "Data Driven Model Identification for a Chaotic Pendulum with Variable Interaction Potential". IDETC 2020, https://doi.org/10.1115/DETC2020-22597
- **M. C. Yesilli**, F. A. Khasawneh, "On Transfer Learning of Traditional Frequency and Time Domain Features In Turning," *15th International Manufacturing Science and Engineering Conference,* MSEC 2020. (*Accepted*)
- **M. C. Yesilli**, S. Tymochko, F. A. Khasawneh, E. Munch, "Chatter Diagnosis Using Topological Data Analysis in Milling Process," In 2019 *18th IEEE International Conference on Machine Learning and Applications,* IEEE, https://doi.org/10.1109/ICMLA.2019.00200
- J. R. Tempelman, A. Myers, **M. C. Yesilli**, "Experimental Investigations Into Broadband Vibration of Metastructures with Lattice Designs," In *Proceedings of the ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference,* IDETC2019, https://doi.org/10.1115/DETC2019-97673

## PRESENTED WORK

**Contributed Talks**

- **On Transfer Learning of Traditional Frequency and Time Domain Features In Turning**, MSEC2020 (Virtual Conference), September 2020
- **Data Driven Model Identification for a Chaotic Pendulum with Variable Interaction Potential**, IDETC/MSNDC (Virtual Conference), August 2020
- **Chatter Classification and Transfer Learning in Turning Using Topological Data Analysis and Dynamic Time Warping**, MSU TDA Seminar, April 2020
- **Topological Feature Vectors for Chatter Detection in Turning Processes**, The 1st Midwest Graduate Student Conference: Geometry and Topology meet Data Analysis and Machine Learning, June 2019
- **Topological Feature Vectors for Chatter Detection in Turning Processes**, SIAM Conference on Applications of Dynamical Systems, May 2019
- **Chatter diagnosis in turning using Topological Data Analysis**, SIAM Great Lakes Section Meeting, April 2019

**Poster**

- A.D. Myers, **M.C. Yesilli**, S. Tymochko, F. Khasawneh and E. Munch, "Teaspoon: A comprehensive python package for topological signal processing." *Topological Data Analysis and Beyond Workshop at NeurIPS 2020.*

## CONFERENCE ACTIVITIES

**Mini-symposium Co-organizer**, *Topological Time Series Analysis,* SIAM Conference on Mathematics of Data Science, May 2020. *(canceled due to COVID-19)*

**Session Chair**, SIAM Conference on Applications of Dynamical Systems, May 2019

## SERVICE

**Measurement** June 2020
*Reviewer*

**Journal of Ambient Intelligence and Humanized Computing** September 2020
*Reviewer*

## PROFESSIONAL AFFILIATIONS & ORGANIZATIONS

**American Society of Mechanical Engineers (ASME)** October 2019 - present
*Member*

**Michigan State University Turkish Student Association(MSU-TSA)** April 2019 - present
*Treasurer*

**Society for Industrial and Applied Mathematics (SIAM)** November 2018 - present
*Member*

## HONORS AND AWARDS

**MSU Graduate Office Fellowship** February 2020

## CODE AND DATA REPOSITORIES

A. Myers, **M. C. Yesilli**, S. Tymochko, F. A. Khasawneh and E. Munch, (2020), Teaspoon: A Topological Signal Processing Package, pypi/teaspoon.

N. Mork, **M. C. Yesilli**, F. A. Khasawneh, (2020). Design of chaotic pendulum with a variable interaction potential, Zenodo, DOI: 10.5281/zenodo.3784897

F. A. Khasawneh, A. Otto and **M. C. Yesilli**, (2019), "Turning Dataset for Chatter Diagnosis Using Machine Learning", Mendeley Data, v1, http://dx.doi.org/10.17632/hvm4wh3jzx.1

**M. C. Yesilli**, F. A. Khasawneh, and A. Otto, (2019), "Machine learning toolbox for Wavelet Packet Transform (WPT) and Ensemble Empirical Mode Decomposition (EEMD)", Github repository.

## TECHNICAL STRENGTHS

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|---|---|
| **Modeling and Analysis** | Solidworks, Matlab |
| **Software & Tools** | LaTeX, MathCad, Python, Sphinx, Inkscape, Parallel Computing, C/C++ |