

# Melih Can Yesilli

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## EDUCATION

**Michigan State University**, East Lansing, MI  
*PhD Candidate, Department of Mechanical Engineering*

August 2018–May 2022 (expected)  
GPA: 3.81/4.0

**Middle East Technical University**, Ankara, Turkey  
*Bachelor of Science, Department of Mechanical Engineering*

September 2013–June 2018  
GPA: 3.47/4.0

## WORK EXPERIENCE

**Michigan State University**  
*Graduate Research Assistant*

East Lansing, MI  
August, 2018 – present

- Focuses on data-driven analysis of complex dynamical systems
- Combines machine learning with tools from Topological Data Analysis to create new investigative methods to study dynamical systems

**Roketsan**

*Engineering Trainee*

Ankara, Turkey  
November, 2017 – April, 2018

- Worked in Advanced Technologies and Systems department and focused on navigation of aerial vehicles

*Intern*

June, 2017 – July, 2017

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

**TEI -TUSAS Engine Industries**

*Intern*

Eskisehir, Turkey  
July, 2016 – August, 2016

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

## TEACHING EXPERIENCE

**Michigan State University**  
*Graduate Teaching Assistant*

East Lansing, MI  
January 2019 – January 2021

- ME461 - Mechanical Vibrations (Fall 2020)
- ME451L - Control Systems Laboratory (Spring 2019, Spring 2020)
- ME422 - Introduction to Combustion - (Fall 2019)
- ME416 - Computer Assisted Design of Thermal Systems - (Fall 2019)

## 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>

### **Preprints**

- **M. C. Yesilli**, F. A. Khasawneh, B. P. Mann, “Transfer Learning for Autonomous Chatter Detection in Machining,” 2021. (*Under review*)
- **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. <https://doi.org/10.1115/MSEC2020-8274>
- **M. C. Yesilli**, S. Tymochko, F. A. Khasawneh, E. Munch, “Chatter Diagnosis in Milling Using Supervised Learning and Topological Features Vector,” 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

- **Chatter Detection in Turning Using Dynamic Time Warping and Approximate and Eliminate Search Algorithm**, SIAM Conference on Applications of Dynamical Systems, May 2021
- **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*.

## 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.

## CONFERENCE ACTIVITIES

- **Minisymposium Co-organizer**, *Topological Signal Processing*, SIAM Conference on Applications of Dynamical Systems, May 2021
- **Minisymposium 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 2021
- **Session Chair**, SIAM Conference on Applications of Dynamical Systems, May 2019

## SERVICE

- **Reviewer**, Journal of Intelligent Manufacturing July 2021
- **Reviewer**, Journal of Intelligent Manufacturing May 2021
- **Reviewer**, SoftwareX February 2021
- **Reviewer**, Journal of Ambient Intelligence and Humanized Computing September 2020
- **Reviewer**, Measurement June 2020

## PROFESSIONAL AFFILIATIONS & ORGANIZATIONS

- **Member**, Association for Computing Machinery (ACM) March 2021 – present
- **Member**, American Society of Mechanical Engineers (ASME) October 2019 – present
- **Event Coordinator**, Michigan State University Turkish Student Association (MSU-TSA) June 2021 – present
- **Treasurer**, Michigan State University Turkish Student Association (MSU-TSA) April 2019 – June 2021
- **Member**, Society for Industrial and Applied Mathematics (SIAM) November 2018 – present

## LEADERSHIP

- *Graduate Student Mentor for ACRES-REU* June, 2021 – present
- Mentoring two undergraduate students who participate in Advanced Computational Research Experience for Undergraduates (ACRES-REU)
- Meeting with students once a week, providing them with guidance on their research, and answering their questions whenever needed

## **AWARDS**

- MSU Graduate Office Fellowship

February 2020

## **TECHNICAL STRENGTHS**

**Programming:** Python, MATLAB, Julia, C/C++, OpenMP, MPI

**Softwares & Tools:** Sphinx, L<sup>A</sup>T<sub>E</sub>X, Solidworks, Inkscape, Arduino