

# MELIH CAN YESILLI

Department of Mechanical Engineering, 474 S Shaw Ln, East Lansing, MI 48824

yesillim@egr.msu.edu

## EDUCATION

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**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

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**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.

**Intern**

June 2017 - July 2017

*Roketsan Missiles Inc.*

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

**Intern**

July 2016 - August 2016

*TEI -TUSAS Engine Industries, Inc.*

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

## PUBLICATIONS

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### 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 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

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### 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

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**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

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|   |                |
|---|----------------|
| <b>Measurement</b><br><i>Reviewer</i>   | June 2020      |
| <b>Journal of Ambient Intelligence and Humanized Computing</b><br><i>Reviewer</i> | September 2020 |

## PROFESSIONAL AFFILIATIONS & ORGANIZATIONS

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|---|-------------------------|
| <b>American Society of Mechanical Engineers (ASME)</b><br><i>Member</i>                   | October 2019 - present  |
| <b>Michigan State University Turkish Student Association(MSU-TSA)</b><br><i>Treasurer</i> | April 2019 - present    |
| <b>Society for Industrial and Applied Mathematics (SIAM)</b><br><i>Member</i>             | November 2018 - present |

## HONORS AND AWARDS

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|---------------------------------------|---------------|
| <b>MSU Graduate Office Fellowship</b> | February 2020 |
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## CODE AND DATA REPOSITORIES

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- 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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|                              |   |
|------------------------------|---|
| <b>Modeling and Analysis</b> | Solidworks, Matlab  |
| <b>Software &amp; Tools</b>  | L <sup>A</sup> T <sub>E</sub> X, MathCad, Python, Sphinx, Inkscape, Parallel Computing, C/C++ |