Tyler N. **Morrison**

Graduate Research Assistant | PhD Student

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Education

The Ohio State University — *Columbus, OH, USA*

Ph.D. Mechanical Engineering – Year 2 — *Aug. 2017 — May 2022 (est.)*

- GPA: 4.00/4.00
- Distinguished University Fellow
- Department of Mechanical Engineering Supplementary Award

The University of Tulsa — *Tulsa, OK, USA*

B.S. Mechanical Engineering — *Aug. 2013 — May 2017*

- GPA: 4.00/4.00
- Chapman Presidential Scholar
- Vision Scholar

Experience

Design, Innovation and Simulation Lab (DISL) — *The Ohio State University, Columbus, OH*

Graduate Research Assistant — *August 2017 — Present*

- Modeled, tested, and analyzed variable stiffness robotic arm links for use in physical human-robot interaction.
- Developed software for, planned, and conducted experiments for interdisciplinary research on attention to preview in human drivers.
- Mentored high school, undergraduate, and MS student research projects.
- Administered and maintained lab server and rapid-prototyping equipment.

NSF Interfaces and Surfaces REU — *Clemson University, Clemson, SC*

REU Research Assistant — *May 2016 — August 2016*

- Conducted numerical simulations of hydrogel membranes under illumination.
- Modeled and implemented code for numerical simulation of magnetically heated gels with cooling effects.
- Mentored incoming MS student on simulation software and high-performance-computing.

Biological Robotics at Tulsa Lab (BRAT Lab) — *The University of Tulsa, Tulsa, OK*

Undergraduate Research Assistant — *May 2015 — July 2017*

- Pursued independent research on grasping and manipulation with quadruped robots.
- Developed optimal foot-shuffle algorithm for quadruped stabilization under disturbances and body-position constraints.
- Developed interactive software to model quadruped kinematics and tip-over stability.

The Tulsa Children's Museum — *Tulsa, OK*

Mechanical Engineering Senior Project — *October 2016 — May 2017*

- Team designed and built a 15 foot steel auger ball-lift system for an exhibit at the children's museum.
- Elected project MVP. Our project was voted second best by our class.
- Video of the project before it was installed in the museum: https://youtu.be/jlq1ikz-zHM

Mechanical Department, Aviation and Federal Division, Burns and McDonnell — *Kansas City, MO*

Mechanical Engineering Intern — *Summer 2015*

- Assisted in designing HVAC and plumbing systems at Tinker Air Force Base, Portland International Airport, the Sampson School at Guantanamo Bay Naval Base, and the Kansas City National Security Campus.

Peer-Reviewed Journal Articles

Richard Jagacinski, Emanuele Rizzi, Benjamin Bloom, Omer Turkkan, **Tyler Morrison**, Hai-Jun Su, Junmin Wang. *Drivers' Attentional Instability on a Winding Roadway*. IEEE Transactions on Human-Machine Systems. 2019. «Published». DOI: 10.1109/THMS.2019.2906612

Oksana Savchak, Konstantin Kornev, **Tyler Morrison**, Olga Kuksenok. *Controlling Deformations of Gel-based Composites by Electromagnetic Signals within GHz Frequency Range*. Soft Matter. 2018. «Published». DOI: 10.1039/C8SM01207E

Conference Papers

Tyler Morrison, Chunhui Li, Xu Pei, Hai-Jun Su. *A Novel Rotating Beam Link for Variable Stiffness Robotics Arms*. IEEE International Conference on Robotics and Automation. *Montreal, CA*. May 2019. «In Press».

Other Selected Research Presentations

Tyler Morrison, Joshua Schultz. *Optimal shuffles to prevent quadruped tipover during cooperation*. Robotics: Science and Systems Workshop on Design and Control of Small Legged Robots. *Pittsburgh, PA, USA*. June 2018. «Poster + Oral».

Tyler Morrison, Olga Kuksenok. *Numerical Simulations of NIPA Gel Membranes Exposed to Heat and Light*. Clemson Undergraduate Research Symposium. *Clemson, SC, USA*. July 2016. «Poster».

Selected Honors & Awards

Graduate

2017 **Distinguished University Fellow**, The Ohio State University — *Columbus, OH, USA*
2017 **Department Supplementary Fellowship Award**, The Ohio State University — *Columbus, OH, USA*

Undergraduate

2017 **College of Engineering and Natural Sciences Steven J. Bellovich Medal**, The University of Tulsa — *Tulsa, OK, USA*
2017 **Sidney Born Award in Mechanical Engineering**, The University of Tulsa — *Tulsa, OK, USA*
2017 **Senior Project – Most Valuable Team Member**, The University of Tulsa, Mechanical Engineering Dept. — *Tulsa, OK, USA*
2017 **Nominee for National Barry Goldwater Scholarship**, The University of Tulsa — *Tulsa, OK, USA*

Graduate Coursework

Design Advanced Kinematics and Mechanisms, Optimal Design of Structures, Form Synthesis and Analysis
Control Lumped Parameter Systems, Digital Control Engineering, Design and Control of Mechatronic Systems
Analysis Intermediate Numerical Methods
Robotics Mechanical Control of Robotics, Design of Smart Products

Skills and Experience

Programming Mathematica, MATLAB, Python, Java, C/C++, LaTeX
Modeling and Design Software Solidworks, Revit, AutoCAD, Adobe Illustrator
Simulation ANSYS, ABAQUS, Solidworks Simulation
Hardware Arduino, Raspberry Pi
Rapid Prototyping 3D-Printing, Laser Cutting, Plasma Cutting

Extracurricular Activity

Tau Beta Pi — *Tulsa, OK, USA*
Involved Member of Oklahoma Beta Chapter — *2015 — 2017*
- Helped lead initiation of new members and organize induction ceremonies and fellowship activities.

Mathematical Association of America Putnam Competition — *Tulsa, OK, USA*
University of Tulsa Team Member and Individual Competitor — *2014, 2015*
- Personal best score of 11, ranks in top 21% of mathematicians in North America. (World-wide median score is zero points).

Boy Scouts of America — *Kansas City, KS, USA*
Eagle Scout — *2001 — 2013*
- Eagle Scout service project: leading and organizing a project to build bookshelves for a library system at a home for troubled children.
- Member of U.S. BSA delegation to the 2011 World Scout Jamboree in Sweden.