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Education

- **Ph.D.** Mechanical Engineering **University of California, Irvine, 1996**
Dissertation: *Global Properties of Constraint Manifolds in the Kinematic Synthesis of Closed Chains*
Advisor: J. Michael McCarthy
- **M.S.** Mechanical Engineering **University of California, Irvine, 1993**
Thesis: *The Central Axis and Circling Axis Congruences as Projections of the Constraint Manifold of the Complementary Screw Quadrilateral*
Advisor: J. Michael McCarthy
- **B.S.** Mechanical Engineering **Rose-Hulman Institute of Technology, 1989**

Professional Experience

- **Professor**, Aug. 2011-present, **Graduate Program Director**, Jul. 2023-present, **Associate Professor**, Aug. 2003-Aug. 2011, **Assistant Professor**, Jan. 1997-Aug. 2003
University of Dayton, Dayton, OH
Department of Mechanical & Aerospace Engineering
- **Associate Director**, Aug. 2007-Jul. 2011
University of Dayton, Dayton, OH
University Honors Program
- **Visiting Researcher**, May-Dec. 2022, Jun.-Dec. 2014, Sep. 2006-Jun. 2007, **Postdoctoral Fellow**, Sep. 1996-Aug. 1997
Université de Montpellier, Montpellier, France
Laboratoire d'Informatique, de Robotique et de Micro-electronique de Montpellier
- **Visiting Faculty**, Air Vehicles Directorate, May-Aug. 2003, May-Aug. 2002, Information Directorate, May-Aug. 2000
Wright Patterson Air Force Base, Fairborn, OH
Air Force Research Laboratory
- **Graduate Research and Teaching Assistant**, Sep. 1990-Aug. 1996
University of California, Irvine, Irvine, CA
Robotics and Automation Laboratory

Journal Publications

- Li, Y., Myszka, D., and **Murray, A.**, "The Kinematics of Constant Curvature Continuum Robots through Three Segments", *IEEE Robotics and Automation Letters*, vol. 8, no. 11, 2023, DOI: [10.1109/LRA.2023.3320946](https://doi.org/10.1109/LRA.2023.3320946)
- Myszka, D., Joo, J., and **Murray, A.**, "A Multi-Objective Optimization for Controlling an Aircraft Using a Bio-Inspired Empennage", *ASME Journal of Mechanisms and Robotics*, vol. 14, no. 4, 2022, pp. 045003:1-8, DOI: [10.1115/1.4053820](https://doi.org/10.1115/1.4053820)
- Lanese, N., Myszka, D., Bazler, A., and **Murray, A.**, "Six-Bar Linkage Models of a Recumbent Tricycle Mechanism to Increase Power Throughput in FES Cycling", *MDPI Robotics*, vol. 11, no. 26, 2022, DOI: [10.3390/robotics11010026](https://doi.org/10.3390/robotics11010026).
- Li, B., Zhou, S., **Murray, A.**, and Subsol, G., "Shape-changing chains for morphometric Analysis of 2D and 3D, open or closed outlines", *Scientific Reports*, vol. 11, 21479, 2021, DOI: [10.1038/s41598-021-00911-5](https://doi.org/10.1038/s41598-021-00911-5).
- **Murray, A.**, McCarthy, J.M., "Computing the developable forms of planar and spherical four-bar linkages", *International Journal of Mechanisms and Robotic Systems*, 2021, vol. 5, No. 1/2, pp. 22-38, DOI: [10.1504/IJMRS.2021.115153](https://doi.org/10.1504/IJMRS.2021.115153)
- Li, Y., **Murray, A.**, and Myszka, D., "Synthesizing Mechanical Chains for Morphing Between Spatial Curves", *ASME Journal of Mechanisms and Robotics*, vol. 12, no. 2, 2020, pp. 021105:1-10.
- Alkestiri, S., **Murray, A.**, and Myszka, D., "Special Unitary Matrices in the Analysis and Synthesis of Spherical Linkages", *ASME Journal of Mechanisms and Robotics*, vol. 11, no. 1, 2019, pp. 014503:1-4.
- Mueller, A., **Murray, A.**, and Krovi, V., "Special Issue: Selected Papers from IDETC 2017", guest editorial, *ASME Journal of Mechanisms and Robotics*, vol. 10, no. 2, 2018, pp. 020201.

- Li, B., Myszka, D., and **Murray**, A., "Design and Experimental Assessment of Variable-Geometry Dies for Polymer Extrusion", *ASME Journal of Mechanical Design*, vol. 140, no. 1, 2018, pp. 011701:1-12.
- Ali, H., **Murray**, A., and Myszka, D., "The Synthesis of Function Generating Mechanisms for Periodic Curves Using Large Numbers of Double-Crank Linkages", *ASME Journal of Mechanisms and Robotics*, vol. 9, no. 3, 2017, pp. 031002:1-8.
- Brake, D., Hauenstein J., **Murray**, A., Myszka, D., and Wampler, C., "The Complete Solution of Alt-Burmester Synthesis Problems for Four-Bar Linkages", *ASME Journal of Mechanisms and Robotics*, vol. 8, no. 10, 2016, pp. 041008:1-8.
- Alkestiri, S., **Murray**, A., Myszka, D., and Wampler, C., "Singularity Traces of Single Degree-of-Freedom Planar Linkages that Include Prismatic and Revolute Joints", *ASME Journal of Mechanisms and Robotics*, vol. 8, no. 5, 2016, 051003:1-3.
- Krovi, V., **Murray**, A., and Schmiedeler, J., "Special Issue: Selected Papers from IDETC 2015", guest editorial, *ASME Journal of Mechanisms and Robotics*, vol. 8, no. 5, 2016, pp. 050301:1-2
- Almandeel, A., **Murray**, A., Myszka, D., and Stumph, H., "A Function Generation Synthesis Methodology for All Defect-Free, Slider-Crank Solutions for Four Precision Points", *ASME Journal of Mechanisms and Robotics*, vol. 7, no. 3, 2015, pp. 031020:1-10
- Myszka, D., **Murray**, A., Giaier, K., Jayaprakash, V., and Gillum, C., "A Mechanical Regenerative Brake and Launch Assist Using an Open Differential and Elastic Energy Storage", *SAE International Journal of Alternative Powertrains*, vol. 4, no. 1, 2015, pp. 199-208
- Li, B., **Murray**, A., and Myszka, D., "Improving Techniques in Statically Equivalent Serial Chain Modeling for Center of Mass Estimation", *ASME Journal of Mechanisms and Robotics*, vol. 7, no. 1, 2015, pp. 011013:1-10
- Myszka, D., Lauden, J., Joyce, P., **Murray**, A., and Gillum C., "Development of a Spring-Based Automotive Starter", *SAE International Journal of Commercial Vehicles*, vol. 7, no. 1, 2014, pp. 286-294
- Myszka, D., **Murray**, A., and Wampler, C., "Computing the Branches, Singularity Trace, and Critical Points of Single Degree-of-Freedom, Closed-Loop Linkages," *ASME Journal of Mechanisms and Robotics*, vol. 6, no. 1, 2014, pp. 011006:1-10
- Shamsudin, S., **Murray**, A., Myszka, D., and Schmiedeler, J., "Kinematic Synthesis of Planar, Shape-Changing Rigid Body Mechanisms for Design Profiles with Significant Differences in Arc Length," *IFTOMM Mechanism and Machine Theory*, vol. 70, no. 12, 2013, pp. 425-440
- Shamsudin, S., and **Murray**, A., "A Closed-Form Solution for the Similarity Transformation Parameters of Two Planar Point Sets," *Journal of Mechanical Engineering Technology*, vol. 5, no. 1, 2013, pp. 59-68
- Zhao, K., Schmiedeler, J.P., and **Murray**, A.P., "Design of planar, shape-changing rigid-body mechanisms for morphing aircraft wings," *ASME Journal of Mechanisms and Robotics*, vol. 4, no. 4, 2012, pp. 041007:1-10
- Perkins, D., and **Murray**, A., "Singularity Free RPR and SPS Chains for Actuating Planar and Spherical Single Degree of Freedom Mechanisms", *ASME Journal of Mechanisms and Robotics*, vol. 4, no. 1, 2012, pp. 011007:1-6
- Cotton, S., Vanoncini, M., Fraisse, P., Ramdani, N., Demircan, E., **Murray**, A.P., and Keller, T., "Estimation of the Centre of Mass from Motion Capture and Force Plate Recordings: A Study on the Elderly", *Applied Bionics and Biomechanics*, vol. 8, 2011, pp. 67-84
- Myszka, D., and **Murray**, A., "Pole Arrangements that Introduce Prismatic Joints into the Design Space of Four- and Five-Position Rigid-Body Synthesis", *IFTOMM Mechanism and Machine Theory*, vol. 45, no. 9, 2010, pp. 1314-25
- Myszka, D., and **Murray**, A., "Slider Cranks as Compatibility Linkages for Parameterizing Center Point Curves", *ASME Journal of Mechanisms and Robotics*, vol. 2, no. 2, 2010, pp. 021007:1-7
- Cotton, S., **Murray**, A., and Fraisse, P., "Estimation of the Center of Mass: From Humanoid Robots to Human Beings", *IEEE/ASME Transactions on Mechatronics*, vol. 14, no. 6, 2009, pp. 707-12
- Persinger, J.A., Schmiedeler, J.P., and **Murray**, A.P., "Synthesis of Planar Rigid-Body Mechanisms Approximating Shape Changes Defined by Closed Curves", *ASME Journal of Mechanical Design*, vol. 131, no. 7, 2009, pp. 071006:1-7
- Myszka, D.H., **Murray**, A.P., and Schmiedeler, J.P., "Singularity Analysis of an Extensible Kinematic Architecture: Assur Class N, Order N-1", *ASME Journal of Mechanisms and Robotics*, vol. 1, no. 1, 2009, pp. 011009:1-7
- Myszka, D.H., **Murray**, A.P., and Schmiedeler, J.P., "Assessing Position Order in Rigid Body Guidance: An Intuitive Approach to Fixed Pivot Selection", *ASME Journal of Mechanical Design*, vol. 131, no. 1, 2009, pp. 014502:1-5
- Frank, G.J., Joo, J.J., Sanders, B., Garner, D.M., and **Murray**, A.P., "Mechanization of a High Aspect Ratio Wing for Aerodynamic Control", *Journal of Intelligent Material Systems and Structures*, vol. 19, September, 2008, pp. 1101-12
- **Murray**, A.P., Schmiedeler, J.P., and Korte, B.M., "Synthesis of Planar, Shape-Changing Rigid-Body Mechanisms", *ASME Journal of Mechanical Design*, vol. 130, no. 3, 2008, pp. 032302:1-10
- **Murray**, A.P., Turner, M.L., and Martin, D.T., "Synthesizing Single DOF Linkages via Transition Linkage Identification", accepted for publication in *ASME Journal of Mechanical Design*, vol. 130, no. 2, 2008, pp. 022301:1-8

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- **Murray**, A. P., and McCarthy, J. M., “Burmester Lines of Spatial Five Position Synthesis from the Analysis of a 3-CPC Platform”, *ASME Journal of Mechanical Design*, vol. 121, no. 1, 1999, pp. 45-49
- **Murray**, A. P., Pierrot, F., Dauchez, P., and McCarthy, J. M., “A Planar Quaternion Approach to the Kinematic Synthesis of a Parallel Manipulator”, *IFR Robotica*, vol.15, Part 4, 1997, pp. 361-365
- **Murray**, A. P., and McCarthy, J. M., “Center-Point Curves Through Six Arbitrary Points”, *ASME Journal of Mechanical Design*, vol. 119, no. 1, 1997, pp. 36-39
- **Murray**, A. P., and McCarthy, J. M., “Passing a Central Axis Congruence Through Six Arbitrary Lines in Space”, *ASME Journal of Mechanical Design*, vol. 118, no. 4, 1996, pp. 515-519
- **Murray**, A. P., and McCarthy, J. M., “Determining Burmester Points from the Analysis of a Planar Platform”, *ASME Journal of Mechanical Design*, vol. 117, no. 2(A), 1995, pp. 303-307

Refereed Conference Publications*

- Liu, J., Khan, M., Myszkka, D., **Murray**, A., “The Synthesis of P-Drivable Single Degree of Freedom Spatial Mechanisms”, *Proc. of the 2023 International Design Engineering Technical Conference*, ASME, 2023.
- Trotobas, C., Azevedo, C., **Murray**, A., “The Kinematic Synthesis of a Spherical Mechanism for Assisting in Wrist Pronation and Supination”, *Proc. of the 2023 International Design Engineering Technical Conference*, ASME, 2023.
- Xu, T., Myszkka, D., **Murray**, A., “Approximate Motion Synthesis of Four-Bar Linkages: A Bi-Invariant Approach”, *Proc. of the 2023 International Design Engineering Technical Conference*, ASME, 2023.
- Li, Y., Myszkka, D., **Murray**, A., “A Backbone-Driven Approach for Positioning of Continuum Robots”, *Proc. of the 2023 International Design Engineering Technical Conference*, ASME, 2023.
- Bazler, A., Myszkka, D., **Murray**, A., “The Redesign of a Recumbent Tricycle using a Crank Rocker Mechanism to Increase Power Throughput in FES Cycling”, *Proc. of the 2021 International Design Engineering Technical Conference*, ASME, 2021.
- Myszkka, D., Joo, J., **Murray**, A., “A Pareto Front Mechanism Optimization for Controlling an Aircraft using a Bio-Inspired Rotating Empennage”, *Proc. of the 2021 International Design Engineering Technical Conference*, ASME, 2021.
- Yang, Q., **Murray**, A., Myszkka, D., and Li. S., “Structure Synthesis of Multi-DOF Planar Metamorphic Mechanisms with a Single Driver”, *Proceedings of the 2020 ASME International Design Engineering Technical Conference*, St. Louis, MO, Aug. 16-19, 2020.
- Murray, A., and McCarthy, J.M., “Computation of the Developable Form of a Planar Four-bar Linkage”, *Proceedings of the 2020 USCToMM Symposium on Mechanical Systems and Robotics*, Rapid City, SD, May 13-16, 2020 (cancelled due to Covid-19), Eds. P. Larochelle and J.M. McCarthy, Springer Nature Switzerland AG, Cham, Switzerland, 2020.
- Mills, A., Myszkka, D., Woods, D., Joo, J., **Murray**, A., “The Structural Suitability of Tensegrity Aircraft Wings”, *Proc. of the AIAA Scitech 2020 Forum*, Orlando, Florida, Jan. 6-10, 2020
- Li, Y., **Murray**, A., and Myszkka, D., “Synthesizing Mechanical Chains for Morphing Between Spatial Curves”, *Proceedings of the 2019 ASME International Design Engineering Technical Conference*, Anaheim, CA, Aug. 18-21, 2019.
- Myszkka, D., Joo, J., Woods, D., and **Murray**, A., “Topology Optimization of Cable-Actuated, Shape-Changing, Tensegrity Systems for Path Generation”, *Proceedings of the 2019 ASME International Design Engineering Technical Conference*, Anaheim, CA, Aug. 18-21, 2019.
- Myszkka, D., **Murray**, A., Armstrong, A., and Ali, H., “Mechanical Presses Driven by a Geared Five-Bar with Sliding Output to Produce Prolonged Dwell”, *Proceedings of the 15th IFToMM World Congress*, Krakow, Poland, Jun. 30-July 4, 2019.
- Rolfe, T., **Murray**, A., and Myszkka, D., “Design and Prototyping a Shape-Changing Rigid-Body Human Foot in Gait”, *Proceedings of the 2018 ASME International Design Engineering Technical Conference*, Quebec City, Canada, Aug. 26-29, 2018.
- Myszkka, D., Fischer, A., and **Murray**, A., “A Study on the Influence of Planar Mechanism Design on Energy Use During Controlled Movements”, *Proceedings of the 2018 ASME International Design Engineering Technical Conference*, Quebec City, Canada, Aug. 26-29, 2018.
- Almestiri, S., **Murray**, A., and Myszkka, D., “Spherical Linkages Analysis and Synthesis by Special Unitary Matrices for Solution via Numerical Algebraic Geometry”, *Proceedings of the 2017 ASME International Design Engineering Technical Conference*, Cleveland, OH, Aug. 6-9, 2017.
- Li, B., **Murray**, A., Myszkka, D., “Synthesizing Planar Rigid-Body Chains for Morphometric Applications”, *Proceedings of the 2016 ASME International Design Engineering Technical Conference*, Charlotte, NC, Aug. 21-24, 2016.

- Almandeel, A., Myszka, D., Gonzalez, A., Fraise, P., and **Murray, A.**, “Rapidly Locating and Accurately Tracking the Center of Mass Using Statically Equivalent Serial Chains”, *Proceedings of the 2015 IEEE International Conference on Humanoid Robots*, Seoul, Korea, Nov. 3-5, 2015.
- Li, B., **Murray, A.**, and Myszka, D., “Designing Variable-Geometry Extrusion Dies that Utilize Planar Shape-Changing Rigid-Body Linkages”, *Proceedings of the 2015 ASME International Design Engineering Technical Conference*, Boston, MA, Aug. 2-5, 2015.
- Almestiri, S., **Murray, A.**, Myszka, D., and Wampler, C., “Singularity Traces of Planar Linkages that Include Prismatic and Revolute Joints”, *Proceedings of the 2015 ASME International Design Engineering Technical Conference*, Boston, MA, Aug. 2-5, 2015.
- Ali, H., **Murray, A.**, and Myszka, D., “Reducing Structural Error in Function Generating Mechanisms Via the Addition of Large Numbers of Four Bar Mechanisms”, *Proceedings of the 2015 ASME International Design Engineering Technical Conference*, Boston, MA, Aug. 2-5, 2015.
- Myszka, D., **Murray, A.**, Giaier, K., Jayaprakash, V., and Gillum, C., “A Mechanical Regenerative Brake and Launch Assist using an Open Differential and Elastic Energy Storage”, *Proceedings of the 2015 SAE World Congress and Exhibition*, SAE Technical Paper 15SDP-0051, Detroit, MI, Apr. 21-23, 2015.
- Giaier, K.S., Myszka, D.H., Kramer, W.P., and **Murray, A.P.**, “Variable Geometry Dies for Polymer Extrusion”, *Proceedings of the ASME 2014 International Mechanical Engineering Congress and Exposition*, Montreal, Canada, Nov. 14-20, 2014
- Giaier, K., **Murray, A.**, and Myszka, D., “Serial Chains of Spherical Four-Bar Mechanisms to Achieve Design Helices”, *Proceedings of the 2014 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Buffalo, NY, Aug. 17-20, 2014
- Nieman, J., Myszka, D., and **Murray, A.**, “A Novel, Elastically-Based, Regenerative Brake and Launch Assist Mechanism”, *Proceedings of the 2014 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Buffalo, NY, Aug. 17-20, 2014
- Li, B., **Murray, A.**, Myszka, D., “Improving Techniques in Statically Equivalent Serial Chain Modeling for Center of Mass Estimation”, *Proceedings of the 2014 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Buffalo, NY, Aug. 17-20, 2014
- Myszka, D.H., Guan, C., Murray, A.P., and Hodapp, T.R., “A Semi-Empirical Prediction Model for the Discharge Line Temperature of Hermetic Compressors”, *Proceedings of the 2014 International Compressor Engineering Conference*, West Lafayette, IN, Jul. 14-17, 2014
- Myszka, D., Lauden, J., Joyce, P., **Murray, A.**, and Gillum, C., “Development of a Spring-Based Automotive Starter”, *Proceedings of the SAE World Congress & Exhibition*, SAE Technical Paper 14SDP-0053, Detroit, MI, Apr. 8-10, 2014
- Tong, Y., Myszka, D., and **Murray, A.**, “Four-Bar Linkage Synthesis for a Combination of Motion and Path-Point Generation,” *Proceedings of the 2013 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Portland, OR, Aug. 4-7, 2013
- Li, L., Myszka, D., **Murray, A.**, and Wampler, C., “Using the Singularity Trace to Understand Linkage Motion Characteristics,” *Proceedings of the 2013 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Portland, OR, Aug. 4-7, 2013
- Li, B., **Murray, A.**, and Myszka, D., “Improving Techniques for Center of Mass Estimation Using Statically Equivalent Serial Chain Modeling,” *Proceedings of the 2013 Canadian Congress of Applied Mechanics*, Saskatoon, Saskatchewan, Canada, Jun. 2-5, 2013
- Myszka, D., **Murray, A.**, and Wampler, C., “Mechanism Branches, Turning Curves, and Critical Points”, *Proceedings of the 2012 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Chicago, IL, Aug. 12-15, 2012
- Zhao, K., Schmiedeler, J.P., and **Murray, A.P.**, “Synthesis of planar, shape-changing compliant mechanisms using pseudo-rigid-body models,” *Proceedings of the 2012 ASME International Design Engineering Technical Conferences and Computers & Information in Engineering Conference*, Chicago, IL, August 12-15, 2012
- Shamsudin, S., **Murray, A.**, Myszka, D., and Schmiedeler, J., “Kinematic Synthesis of Planar, Shape-Changing Rigid Body Mechanisms for Design Profiles With Significant Differences in Arc Length”, *Proceedings of the 2011 ASME International Design and Engineering Technical Conferences*, Washington, DC, Aug. 28-31, 2011
- Perkins, D., and **Murray, A.**, “Synthesis of Coupler-Drivers for Four Position Planar Synthesis Tasks”, *Proceedings of the 2011 ASME International Design and Engineering Technical Conferences*, Washington, DC, Aug. 28-Aug. 31, 2011
- Zhao, K., Schmiedeler, J., and **Murray, A.**, “Kinematic Synthesis of Planar, Shape-Changing Rigid Body Mechanisms with Prismatic Joints”, *Proceedings of the 2011 ASME International Design and Engineering Technical Conferences*, Washington, DC, Aug. 28-Aug. 31, 2011

- Perkins, D., and **Murray**, A., "Singularity-Free RPR and SPS Chains for Actuating Single Degree of Freedom Planar and Spherical Mechanisms", *Proceedings of the 2010 ASME International Design and Engineering Technical Conferences*, Montreal, Can, Aug. 15-Aug. 18, 2010
- Myszka, D., **Murray**, A., and Schmiedeler, J., "Using a Singularity Locus to Exhibit the Number of Geometric Inversions, Transitions and Circuits of a Linkage", *Proceedings of the 2010 ASME International Design and Engineering Technical Conferences*, Montreal, Can, Aug. 15-Aug. 18, 2010
- Cotton, S., Fraisse, P., and **Murray**, A., "On the Manipulability of the Center of Mass of Humanoid Robots, Application to Design", *Proceedings of the 2010 ASME International Design and Engineering Technical Conferences*, Montreal, Can, Aug. 15-Aug. 18, 2010
- Myszka, D., and **Murray**, A., "Slider Cranks as Compatibility Linkages for Parameterizing Center Point Curves", *Proceedings of the 2009 ASME International Design and Engineering Technical Conferences*, San Diego, CA, Aug. 30-Sep. 2, 2009
- Myszka, D., and **Murray**, A., "Identifying Sets of Four and Five Positions That Generate Distinctive Center-Point Curves", *Proceedings of the 2009 ASME International Design and Engineering Technical Conferences*, San Diego, CA, Aug. 30-Sep. 2, 2009
- Perkins, D., and **Murray**, A., "Comparison of Torque and Coupler-Driven Four-Bar Mechanisms As Solutions to Planar Four Position and Spherical Four Orientation Tasks", *Proceedings of the 2009 ASME International Design and Engineering Technical Conferences*, San Diego, CA, Aug. 30-Sep. 2, 2009
- Cotton, S., **Murray**, A., and Fraisse, P., "Estimation of the Center of Mass Using Statically Equivalent Serial Chains", *Proceedings of the 2009 ASME International Design Engineering Technical Conferences*, San Diego, CA, Aug. 30-Sep. 2, 2009
- Cotton, S., **Murray**, A., and Fraisse, P., "Statically Equivalent Serial Chains for Modeling the Center of Mass of Humanoid Robots", *Proceedings of the 2008 IEEE-RAS International Conference on Human Robotics*, Daejeon, Korea, Dec. 1-3, 2008
- Myszka, D.H., **Murray**, A.P., and Schmiedeler, J.P., "Singularity Analysis of Rigid-Body, Closed-Loop, Shape Changing Mechanisms", *Proceedings of the 2008 ASME International Design Engineering Technical Conferences*, New York, Aug. 3-6, 2008
- Persinger, J., Schmiedeler, J., and **Murray**, A., "Synthesis of Planar Shape-Changing Rigid-Body Mechanisms Approximating Closed Curves", *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Las Vegas, Sept. 4-7, 2007
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- Grimm, E., **Murray**, A., and Turner, M., "Software for the Kinematic Synthesis of Coupler-Driven Spherical Four-Bar Mechanisms", *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Las Vegas, Sept. 4-7, 2007
- Perkins, D., Turner, M., and **Murray**, A., "Static Analysis of Torque and Coupler Driven Spherical Four-bar Mechanisms with an Applied Load", *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Las Vegas, Sept. 4-7, 2007
- **Murray**, A., and Pierrot, F., "Design of a High-Speed Spherical Four-bar Mechanism for use in a Motion Common in Assembly Processes", *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Las Vegas, Sept. 4-7, 2007
- Turner, M., Grimm, E., Debrosse, D., Kosmac, K., and **Murray**, A., "Software for Investigating the Kinematics, Statics and Dynamics of Coupler-Driven Four-Bars for Two Position Synthesis", *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Las Vegas, Sept. 4-7, 2007
- Korte, B., **Murray**, A. and Schmiedeler, J., "Synthesis of Planar, Shape-Changing Rigid Body Mechanisms", *Proceedings of the 2006 ASME International Design Engineering Technical Conferences*, Philadelphia, Pennsylvania. Paper # DETC2006-99431. ASME Press. September 10 - 13, 2006
- **Murray**, A., Korte, B. and Schmiedeler, J., "Approximation Planar, Morphing Curves with Rigid Body Linkages", *Proceedings of the 10th International Symposium on Advances in Robot Kinematics (ARK)*, Ljubljana, Slovenia, June 25-29, 2006
- Turner, M., **Murray**, A., Perkins, D. and Larochelle, P., "Systematic Process for Constructing Spherical Four Bar Mechanisms", *Proceedings of the 2005 ASME International Mechanical Engineering Congress and Exposition*, Orlando, Florida. Paper # IMECE2005-80058. ASME Press. November 5 - 11, 2005

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- Perry, L., and **Murray**, A. "Suggesting Joint Limitations and Physical Parameters for Motion Generating 3 DOF Planar Chains," *Proceedings of the 2003 ASME Design Engineering Technical Conference*, Chicago, Sept., 2003
- Martin, D., and **Murray**, A. "Developing Classifications for Synthesizing, Refining, and Animating Planar Mechanisms," *Proceedings of the 2002 ASME Design Engineering Technical Conference*, Montreal, Sept., 2002
- Perry, L., Turner M. and **Murray**, A. "Two Position, Two Velocity Synthesis of a Spherical Mechanism with Translating Center," *Proceedings of the 2002 ASME Design Engineering Technical Conference*, Montreal, Sept., 2002
- **Murray**, A., Stevens, J., Smari, W., Kremer, G. and Marquart, J. "Early Lessons in Executing Distributed Collaborative Student Design Projects," *Proceedings of the 2001 ASME Design Engineering Technical Conference*, Baltimore, Sept., 2001
- Doepker, P. and **Murray**, A., "Experiences in Integrating the Product Realization Process into the Design Curriculum," *Proceedings of the 2001 ASME Design Engineering Technical Conference*, Baltimore, Sept., 2001
- **Murray** A., Stevens, J. and Smari, W., "Learning the Tools and Techniques of Geographically Dispersed Collaborative Design Via a Brief Student Project," *Proceedings of the 2001 ASEE Annual Conference and Exposition*, Albuquerque, NM, July, 2001
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- Hanchak, M. S. and **Murray**, A. P., "Kinematic Synthesis of Binary Actuated Mechanisms for Rigid Body Guidance," *Proceedings of the 2000 ASME Design Engineering Technical Conference*, Baltimore, MD, Sept., 2000
- Stumph, H. E. and **Murray**, A. P., "SDAMP: Software for the Design and Analysis of Mechanical Presses," *Proceedings of the 2000 ASME Design Engineering Technical Conference*, Baltimore, MD, Sept., 2000
- Stumph, H. E. and **Murray**, A. P., "Defect-free Slider-crank Function Generation for 4.5 Precision Points," *Proceedings of the 2000 ASME Design Engineering Technical Conference*, Baltimore, MD, Sept., 2000
- **Murray**, A. P. and Hanchak, M., "Kinematic Synthesis of Planar Platforms with RPR, PRR and RRR Chains", *Advances in Robot Kinematics*, Ed. J. Lenarcic and M. Stanisic, Academic Publishers, Boston, MA, June, 2000
- **Murray**, A. P. and Pierrot, F., "N-Position Synthesis of Parallel Planar Platforms", *Advances in Kinematics: Robotics and Control*, Ed. J. Lenarcic and M. Husty, Academic Publishers, Boston, MA, June, 1998, pp. 69-78
- **Murray**, A. P. and Larochelle, P. M., "A Classification Scheme for Planar 4R, Spherical 4R and Spatial RCCC Linkages to Facilitate Computer Animation", *Proceedings of the 1998 ASME Design Engineering Technical Conferences: Mechanisms Conference*, Atlanta, Georgia, 1998
- **Murray**, A. P. and McCarthy, J. M., "Constraint Manifold Synthesis of Planar Linkages", *Proceedings of the 1996 ASME Design Engineering Technical Conferences: Mechanisms Conference*, Irvine, CA, August, 1996
- **Murray**, A. P., Pierrot, F., Dauchez, P. and McCarthy, J. M., "On the Design of Parallel Manipulators for a Prescribed Workspace: a Planar Quaternion Approach", *5th International Symposium on Advances in Robot Kinematics*, Ed. J. Lenarcic and V. Parenti-Castelli, Kluwer Academic Publishers, Boston, MA, June, 1996, pp. 349-357
- **Murray**, A. P. and McCarthy, J. M., "A Linkage Type Map for Spherical 4 Position Synthesis", *Proceedings of the 1995 ASME Design Engineering Technical Conferences*, Boston, MA, Sept., 1995
- **Murray**, A. and McCarthy, J., "Five Position Synthesis of Spatial CC Dyads", *Proceedings of the 1994 ASME Design Engineering Technical Conferences: Mechanisms Conference*, DE-Vol. 70, Minneapolis, MN, Sept., 1994
- **Murray**, A. and McCarthy, J., "Characterizing the Workspace of the Spherical Image of Cooperating Robots", *Advances in Robot Kinematics and Computational Geometry*, Ed. J. Lenarcic and B. Ravani, Kluwer, Academic Publishers, Boston, MA, 1994.
- Larochelle, P., Dooley, J., **Murray**, A. and McCarthy, J., "SPHINX: Software for Synthesizing Spherical 4R Mechanisms", *Proceedings of the NSF Design and Manufacturing Systems Conference*, University of North Carolina at Charlotte, NC, Jan., 1993, pp. 607-611

- Park, F., **Murray**, A. and McCarthy, J., “Designing Mechanisms for Workspace Fit”, *Computational Kinematics: Proceedings of the Computational Kinematics Workshop*, Dahgstuhl, Germany, Ed. J. Angeles, G. Hommel and P. Kovacs, Kluwer Academic Publishers, Boston, MA, 1993, pp. 295-306
- Bodduluri, R. M. C., **Murray**, A. and McCarthy, J. M., “The Opposite Pole Quadrilateral Parameterization of Planar and Spherical Center Point and Circling Point Curves”, *Proceedings of the Applied Mechanisms and Robotics Conference*, Cincinnati, OH, Nov., 1991

* Non-refereed Conference Publications not listed

Encyclopedia Entry

- Murray, A., McCarthy, J.M., entry on “Kinematics”, *Encyclopedia of Robotics*, Eds. Ang, M., Khatib, O., Siciliano, B., for the chapter “Kinematics”, Ed. McCarthy, J.M., Springer. DOI: [10.1007/978-3-642-41610-1](https://doi.org/10.1007/978-3-642-41610-1), 121-1.

Awards and Honors

- A.T. Yang Memorial Award in Kinematics, to the authors of the best theoretical kinematics paper at the Mechanisms & Robotics Conference, for “The Synthesis of P-Drivable Single Degree of Freedom Spatial Mechanisms”, 2023
- Presenter at Spotlight on Technology, Arts, Research and Scholarship (STARS), University of Dayton, 2015
- ASME Fellow, elected 2014
- Alumni Award for Faculty Teaching, University of Dayton’s highest teaching award, 2013
- Award for Faculty Excellence in Teaching, Southwestern Ohio Council for Higher Education, 2011
- Top Engineering Professor, Univ. of Dayton chapter of Society of Women Engineers, 2011
- Professor of the Year, Univ. of Dayton chapter of Epsilon Delta Tau Fraternity, 2009
- Award for Educational Excellence, Univ. of Dayton chapter of Alpha Nu Omega Fraternity, 2009
- Best Paper Award, 30th ASME Mechanisms and Robotics Conference, 2006
- University of Dayton Humanities Fellows recipient, 2005-2007
- Co-Chair of the 18th Annual University of Dayton Stander Symposium, 2006
- Selected for the “Engineering and a Catholic University” seminar and planning team, University of Dayton, 2004-2005
- University of Dayton School of Engineering Award for Excellence in Teaching, 2001
- Professor of the Year, Univ. of Dayton chapter of Pi Tau Sigma 2001
- MDI Mechanical Simulation Software Award, 26th ASME Mechanisms and Robotics Conference, 2000
- University of Dayton Teaching Fellow, 1998-1999
- Bourses Chateaubriand fellowship supporting a year of study in France, 1996-1997

External Research Funding

- “Robotic Source Capsule Loading, Welding and Inspection”
VEGA Americas
1-year (2015-2016) \$37,962 as PI, +\$9,045 in UD GAA tuition supplements
- “Collaborative Research: Variable-Geometry Dies for Polymer Extrusion”
National Science Foundation
3-year (2012-2015) \$318,830 as PI, +\$33,970 in NSF REU supplements, +\$13,316 in UD GAA tuition supplements
- “Novel Concepts for Spring-Based Mechanical Energy Storage in Motor Vehicles”
General Motors Global Research and Development
2-year (2010-2012), \$140,000 as PI
- “Flow Field Modification for Aero-Optics Applications Using Shape Change”
AFRL/DAGSI Ohio Student-Faculty Research Fellowship Program
1-year (2006-2007), \$63,060 with PI J. Schmiedeler, The Ohio State University, 0% to Univ. of Dayton
- “PODS: Novel Devices for Spatial Assembly Tasks”
National Science Foundation
3-year (2004-2007), \$275,000 as PI (plus \$25,000 in supplemental awards)
- “Software for the Kinematic Synthesis and Optimization of Balancing Mechanisms”
OPW Engineered Systems, Lebanon, OH
1-year (2003-2004), \$13,000 as PI
- “Design of a Tensegrity-Based Deformable Wing”
Air Force Research Laboratory, Air Vehicles Directorate
1-year (2002-2003), \$45,000 as PI (UDRI sub-contract with PI Robert Brockman)

- “SDAMP: Software for the Design and Analysis of Mechanical Presses”
The Minster Machine Company, Minster, OH
1-year (2000-2001), \$9,600 as PI

Internal Funding for Research and Teaching

- “EGR 351 – By Design”, KEEN Fellow Co-hort 2
KEEN Foundation via the UD Visioneering Center
1-year (2016) \$17,724 as PI
- “Inventive Design”
University of Dayton New Engineering Program
1-year (2004) \$4,500 as PI
- “Novel, Low Cost, Robotic Manipulation in Lean Manufacturing”
University of Dayton Research Council Seed Grant
1-year (2000) \$7,600 as PI
- “Experiential Learning to Prepare Students for Geographically Disperse Collaborative Engineering Environments”
University of Dayton Fund for Educational Development
1-year (2000) \$4,000 as PI
- “Novel, Low Cost, Robotic Manipulation in Lean Manufacturing”
Ohio Board of Regents Challenge Grant Program
1-year (1999-2000) \$40,000 as PI
- “A Methodology for Designing Machine Tools with Novel Closed Chain Topologies”
University of Dayton Research Council Seed Grant
1-year (1998) \$4,000 as PI
- “Interactive Software to Enhance the Learning of New Techniques in the Design of Mechanical Systems”
University of Dayton Fund for Educational Development
1-year (1998) \$4,000 as PI

University of Dayton Teaching Activities

- Undergraduate
Course title, typical year of enrolled students, course taught or developed by Murray, brief description
“Mechanical Reasoning”, 2nd, developed, graphical reasoning including pos. & vel. analysis, statics, mech. adv.
“Computational Methods”, 2nd, developed, introduction to MATLAB and programming
“Theory of Machines”, 3rd, taught, gear, cam, linkage analysis and design
“Mechanical Design Laboratory”, 4th, taught, capstone design
“Feedback Control Systems”, 4th, taught, basics of SISO systems
“Engineering Analysis”, 4th, taught, modeling physical systems, selecting solution techniques
“Robot Modeling”, 4th and grad, developed, forward & inverse kinematics, Jacobians, singularities
“Inventive Design”, 4th and grad, developed, project-based toy design in teams
“By Design”, 4th, developed, team taught w/ Rel. Studies faculty on design as a practice, non-technical
- Graduate
“Kinematic Principles in Design”, grad, developed, kinematic synthesis techniques
“Theoretical Kinematics”, grad, taught, homogeneous transforms, dual quaternions & screw theory
“Geometric Methods in Kinematics”, grad, developed, instantaneous methods in kinematics
“Computational Methods for Design”, grad, developed, design & optimization using MATLAB
- Recent evaluations from all sections of 12 or more students. Students asked:
Q1: “I learned a great deal from this course”, Q2: “I would recommend this instructor to other students”
Responses on a 5.0-point scale, 5.0 = “strongly agree”, 1.0 = “strongly disagree”.
Term, course number & section, enrollment, Q1 average Murray score, Q2 average Murray score

Fa 23, MEE 321 01, 36, Q1 4.8, Q2 4.9	Fa 23, MEE 321 02, 33, Q1 4.8, Q2 4.8
Fa 23, MEE 321 03, 21, Q1 4.7, Q2 4.9	Sp 23, MEE 421 01, 10, Q1 4.8, Q2 5.0
Sp 23, MEE 321 01, 41, Q1 4.6, Q2 4.6	Sp 23, MEE 321 02, 34, Q1 4.5, Q2 4.6
Sp 22, MEE 321 01, 42, Q1 4.5, Q2 4.6	Sp 22, MEE 321 02, 23, Q1 4.6, Q2 4.6
Sp 22, MEE 590 P1, 19, Q1 4.7, Q2 4.7	Fa 21, MEE 321 01, 35, Q1 4.8, Q2 4.8
Fa 21, MEE 321 02, 32, Q1 4.7, Q2 4.7	Fa 21, MEE 321 03, 13, Q1 4.8, Q2 4.7
Sp 21, MEE 321 01, 32, Q1 4.3, Q2 4.1	Sp 21, MEE 321 02, 23, Q1 4.7, Q2 4.8

Sp 21, MEE 321 03, 35, Q1 4.4, Q2 4.4
Fa 20, MEE 321 02, 34, Q1 4.4, Q2 4.3
Sp 20, MEE 321 01, 34, Q1 5.0, Q2 4.9
Sp 20, MEE 321 03, 32, Q1 4.8, Q2 4.9
Fa 19, MEE 321 02, 36, Q1 4.7, Q2 4.6
Sp 19, MEE 321 01, 56, Q1 4.6, Q2 4.7
Sp 19, EGR 351 01, 23, Q1 4.4, Q2 4.3
Fa 18, MEE 321 02, 36, Q1 4.6, Q2 4.7
Su 18, MEE 321 Z1, 12, Q1 4.6, Q2 4.8
Sp 18, MEE 321 02, 46, Q1 4.9, Q2 4.8
Fa 17, MEE 321 01, 43, Q1 4.7, Q2 4.7
Fa 17, MEE 321 03, 25, Q1 4.8, Q2 4.8
Sp 17, MEE 321 01, 30, Q1 4.8, Q2 4.6
Sp 17, MEE 490 01, 14, Q1 4.7, Q2 4.8

Fa 20, MEE 321 01, 35, Q1 4.8, Q2 4.6
Fa 20, MEE 321 03, 25, Q1 4.7, Q2 4.9
Sp 20, MEE 321 02, 21, Q1 4.7, Q2 4.8
Fa 19, MEE 321 01, 33, Q1 4.5, Q2 4.7
Fa 19, MEE 321 03, 25, Q1 4.6, Q2 4.8
Sp 19, MEE 520 01, 20, Q1 4.9, Q2 4.8
Fa 18, MEE 321 01, 32, Q1 4.7, Q2 4.7
Fa 18, MEE 321 03, 17, Q1 4.7, Q2 4.7
Sp 18, MEE 321 01, 55, Q1 4.8, Q2 4.8
Sp 18, EGR 351 01, 18, Q1 5.0, Q2 5.0
Fa 17, MEE 321 02, 47, Q1 4.7, Q2 4.7
Su 17, MEE 321 01, 13, Q1 4.7, Q2 4.9
Sp 17, MEE 321 02, 21, Q1 4.8, Q2 4.8

Full Courses at other Campuses and Universities

- “Robotics and Applications”, Southeast University, Nanjing, China, senior level, 24 hours of lecture, Summer 2019, 24 students
- “Making (and Moving) Machines in MATLAB”, University of Dayton’s China Institute, Suzhou, China, 3 credit hours, Jan. 2018, 11 students
- “Robot Motion Analysis and Kinematic Synthesis of Machines”, University of Dayton’s China Institute, Suzhou, China, 3 credit hours, Jan. 2016, 17 students

Invited Short Courses

- “Center of Mass Identification in Humans”, Université de Montpellier, MS level, 4 hrs., Fall, 2015, 15 students
- “Kinematic and Static Modelling of Humanoids”, Université de Montpellier, MS level, 12 hrs., Fall, 2014, 16 students
- “Kinematic Synthesis of Mechanisms”, Université de Montpellier, MS level, 12 hrs., Fall, 2007, 24 students

Keynotes & Panels

- Panelist, “Humanizing Technology”
Univ. of Dayton installation of President Eric Spina, Dayton, OH, Apr. 2017
- Keynote, “Applications of Bertini in Kinematics, Robotics, and Machine Design”
The Software and Applications of Numerical Algebraic Geometry Workshop
Univ. of Notre Dame, South Bend, IN, May 2016

Invited Seminars & Lectures

- “Five Bio-Focused DIMLab Machine Design Projects: From Tricycles to Feet to Measuring Leaves”
Université Montpellier, Montpellier, France Sep. 2022, part of the monthly *LabEx NUMEV Seminars* series
- “When Ideas go DIM – the Design of Innovative Machines Lab’s Currents Projects”
Southeast University, Nanjing, China, May 2022, part of their *120th Founding Anniversary* series
- “Design with Many Moving Parts - The Links Between Things”
Shanghai University, Shanghai, China, Jul. 2019
- “The Links Between Things – Design with Many Moving Parts”
Saint Louis University, St. Louis, Mo., Mar. 2018
- “Design with Many (& Sometimes Too Many) Links”
Changzhou University, Changzhou, China, Jan. 2018
- “Design with Many (& Sometimes Too Many) Links”
Southeast University, Nanjing, China, Jan. 2018
- “Design with Many (& Sometimes Too Many) Links”
LIRMM, Montpellier, France, Mar. 2017
- “Design Involving Many Links: Shape-Changing Mechanisms in Dies and Morphometry, Infinity Chains, and Statically Equivalent Serial Chains”
Seoul National University, Seoul, Korea, Nov. 2015
- “Complexity for Simplicity: The Elegance of Variable Geometry Mechanisms”

University of Dayton STARS, Dayton OH, Sep. 2015

- “Accurately Locating and Tracking the Center of Mass in Humanoids and Humans”
Sapienza, Università di Roma, Rome, Italy, Dec. 2014
- “From High Order Polynomials to Low Degree of Freedom Machines: An Overview of Research in the DIMLab”
LIRMM HRP-4 Inaugural Workshop, L.I.R.M.M., Montpellier, France, Mar. 2014
- “Statically Equivalent Serial Chain Modeling”
M.S. Electrical Engineering course “Robotics: Modeling & Control”
Université Montpellier II, Montpellier, France, Mar. 2014
- “Everything I Know About Teaching”
University of Dayton New Faculty Orientation, Dayton OH, Aug. 2013
- “Morphing Between Shapes the Old-Fashioned Way”
Ignite Innovation: Dayton Regional Science Festival, Dayton OH, Sep. 2011
- “Adaptive Structures Research using Planar Rigid-Body Mechanisms”
Boeing Research and Technology, St. Louis, Jun. 2011

Media

- STARS presentation “Complexity for Simplicity: The Elegance of Variable Geometry Mechanisms” video,
<https://www.youtube.com/watch?v=8zg62ne19pU>
- 90 Second Lectures video, <https://www.youtube.com/watch?v=4589op6bH8Y>
“Why Are We Addicted to Gasoline?”
Video on stored energy in gasoline as part of the University of Dayton’s “90 Second Lectures” Series, 2015
- Blurb selected for the back cover of B. Kallenberg’s “By Design: Ethics, Theology and the Practice of Engineering”
Wipf and Stock Publishers, 2013
- 90 Second Lectures video, <https://www.youtube.com/watch?v=IE6hUjjQVSc>
“Can you Lift the Empire State Building with the Weight of a Notebook?”
Video on mechanical advantage as part of the University of Dayton’s “90 Second Lectures” Series, 2012

Visiting Scholars Hosted

- A. Desoky, May-Aug. 2020, Ph.D. candidate, Military Technical College, Cairo, Egypt. Visit cancelled due to Covid-19.
- J. Liu, Nov. 2019-Oct. 2020, Professor and Master Tutor, School of Mechanical Engineering and Automation
Liaoning University of Science and Technology, Anshan City, China
- Q. Yang, Oct. 2018-Oct. 2019, Associate Professor, School of Mechanical Engineering and Automation
Northeastern University, Shenyang, China

Ph.D. Research Directed

- T. Xu, expected Dec. 2025, advised with D. Myszka
Title not yet selected
- Y. Li, expected May 2024, advised with D. Myszka
“The Kinematics of Constant Curvature Continuum Robots”
- C. Trotobas, Aug. 2023, advised with C. Azevedo-Coste of Institut National de Recherche en Sciences et Technologies du Numérique (INRIA), Montpellier, France
“Restoring of Grasping Function through Assistive Orthoses for Individuals with Arm Paralysis”
- S. Almestiri, May 2018, advised with D. Myszka
“The Dual of SU(2) in the Analysis of Spatial Linkages, SU(2) in the Synthesis of Spherical Linkages, and Isotropic Coordinates in Planar Linkage Singularity Trace Generation”
- B. Li, Aug. 2017, advised with D. Myszka
“Variable Geometry Extrusion Die Synthesis and Morphometric Analysis via Planar, Shape-changing Rigid Body Mechanisms”
- A. Almandeel, Dec. 2015, advised with D. Myszka
“Rapidly Locating and Accurately Tracking the Center of Mass Using Statically Equivalent Serial Chains”
- S. Shamsudin, May 2013
“Kinematic Synthesis of Planar, Shape-Changing Rigid Body Mechanisms for Design Profiles with Significant Differences in Arc Length”
- D. Perkins, Dec. 2011

- “Synthesis Techniques for Coupler-Driven Planar and Spherical Single Degree of Freedom Mechanisms”
- S. Cotton, Jul. 2010, co-advised with P. Fraise of Université de Montpellier II, Montpellier, France
“Modélisation, dynamique et estimation du centre de masse de robots humanoïdes”,
 (“Modeling, Dynamics, and Estimation of the Center of Mass of Humanoid Robots”)
- D. Myszka, Aug. 2009
“Kinematic Synthesis and Analysis Techniques to Improve Planar Rigid-Body Guidance”

M.S. Thesis Research Directed

- J. Studnicka, expected May 2024, advised with D. Myszka
“Mechanical System Optimization for Bio-Inspired Aircraft”
- M. Khan, Dec. 2023, advised with D. Myszka
“Advances in Multi-Robot Path Planning and Singularity Avoidance in Single DOF Systems”
- C. Ives, Dec. 2022, advised with D. Myszka
“An Automated Topology Optimization Results Interpreter for an Aircraft with a Bio-Inspired Rotating Empennage”
- A. Bazler, Dec. 2020, advised with D. Myszka
“The Redesign of a Recumbent Tricycle using a Crank Rocker Mechanism to Increase Power Throughput in FES Cycling”
- A. Mills, May 2020, advised with D. Myszka
“Design of a Tensegrity Wing”
- H. Ali, Dec. 2015, advised with D. Myszka
“Reducing Structural Error in Function Generating Mechanisms via the Addition of Large Numbers of Double-Crank Linkages”
- K. Giaier, Dec. 2014, advised with D. Myszka
“Designing Shape Changing Mechanisms for Planar and Spatial Applications”
- J. Nieman, May 2014, advised with D. Myszka
“A Novel, Elastically-Based, Regenerative Brake and Launch Assist Mechanism”
- B. Li, Aug. 2013, advised with D. Myszka
“Improving Techniques for Center of Mass Estimation Using Statically Equivalent Serial Chain Modeling”
- Y. Tong, May 2013, advised with D. Myszka
“Four-bar Linkage Synthesis for a Combination of Motion and Path-Point Generation”
- L. Li, May 2013, advised with D. Myszka
“Using the Singularity Trace to Understand Linkage Motion Characteristics”
- M. Sejba, Dec. 2004
“The Development of Software Tools for the Redesign of Loading Arm Counter Balance Mechanisms”
- L. Perry, Aug. 2003
“Contributions to the Synthesis of Ps4R Spatial Mechanisms, 6 DOF Spatial Open Chains, and Planar Four-bars, Six-bars and 3DOF Open Chains”
- J. Stevens, Aug. 2001
“The Synthesis Form of the Constraint Manifold in the Design of Planar Parallel Manipulators”
- M. Hanchak, May 2000
“Kinematic Synthesis of Binary and Continuously Actuated Planar Platforms”
- H. Stumph, May 2000
“Kinematic Synthesis of Four and Six Link Mechanisms used in Mechanical Presses”

M.S. Project Research Directed

- K. Naumann, May 2023, advised with D. Myszka
“Generating Low Order Weight Models for Mechanical Design of an Aircraft with Bio-Inspired Rotating Empennage”
- P. Hudak, May 2023, advised with D. Myszka
“Design of a Smart Nozzle to Direct Coolant Flow in CNC Grinding Operations”
- F. Odon, May 2023, advised with C. Trotobas
“Prototyping a Novel Orthotic for Wrist Pronation and Supination”
- D. Cunningham, Aug. 2022, advised with D. Myszka
“Optimization of Novel Mechanical Press Architectures”
- N. Lanese, May 2022, advised with D. Myszka
“The Redesign of a Recumbent Tricycle using a Coupler-Driven Mechanism to Increase Power Throughput in FES Cycling”

- A. Wicks, Dec. 2020, advised with D. Myszka
"Printable 3D Cube Mazes" (myminifactory.com/users/DIMLab)
- T. Xi, Dec. 2020, advised with D. Myszka
"Six-Bar Mechanical Press Kinematic Synthesis using Algebraic Numerical Geometry"
- T. Chen, May 2020, advises with D. Myszka
"Kinematic Synthesis of Soft Robotic Chains using Rigid-Body Shape Change Theory"
- Y. Cai, May 2020, advised with D. Myszka
"A Bi-Invariant Metric for Evaluating Solutions to Approximate Motion Synthesis Problems"
- A. Armstrong, Dec. 2018, advised with D. Myszka
"Design of a Mechanical Press with a Novel Architecture for Extended Dwell"
- H. Viradiya, Aug. 2018, advised with D. Myszka
"CAD Motion Analysis of a Novel Mechanical Press Concept"
- K. Brand, May 2018, advised with D. Myszka
"Calibration and Protocol Improvements in Statically Equivalent Serial Chain Modeling"
- T. This, May 2018, advised with D. Myszka
"Development of Morphing Aircraft Structures Concepts"
- A. Fischer, Dec. 2017, advised with D. Myszka
"Design of Energy Efficient Pick and Place Mechanisms"
- B. Smith, Dec. 2017, advised with D. Myszka
"CAD Modeling of a Novel Mechanical Press Concept"
- S. Conway, Aug. 2017, advised with D. Myszka
"Mechanical Design of Variable Geometry Extrusion Dies"
- J. Vogel, May 2017, advised with D. Myszka
"Mechanical Design of Variable Geometry Extrusion Dies for Extreme Changes in Profile"
- A. Hazlett, Dec. 2016, advised with D. Myszka
"Robotics Source Capsule Loading, Welding and Inspection"
- A. Swigert, Dec. 2015, advised with D. Myszka
"Laser Scan Analysis of Variable Geometry Die Profiles"
- S. Kanathala, Dec. 2015, advised with D. Myszka
"Analysis of Variable Geometry Die Joint Leakage"
- V. Jayaparakash, Dec. 2015, advised with D. Myszka
"A Mechanical Regenerative Brake and Launch Assist using a Differential Mechanism and Elastic Energy Storage"
- C. Guan, May 2014, advised with D. Myszka
"A Semi-Empirical Prediction Model for the Discharge Line Temperature of Hermetic Compressors"
- Y. Liang, May 2014, advised with D. Myszka
"Assessment of Port Opening and Closing in a Scroll Compressor"
- B. O'Grady, Aug. 2010
"Rapid Prototyping of Spherical Mechanisms"
- E. Grimm, Dec. 2006
"Software for the Synthesis of Coupler-Driven Spherical Four-bar Mechanisms"
- S. Akepati, May 2006
"Kinematic Synthesis Issues in Planar Three-Legged Platforms"
- S. Chuahan, Aug. 2005
"Synthesizing Planar Platforms from RPR, PRR and RRR Chains"
- S. Bilen, May 2005
"Position Selection to Generate Special Cases of Center-Point Curves"
- T. Blum, May 2005
"Developing a Course in Innovative Design for Mechanical Engineers"
- D. Garner, Dec. 2003
"The Relationship Between Poles and Degenerate Center-Point Curves"
- D. Martin, May 2002
"Transition Linkages of Planar Four-Bar Mechanisms"

Undergraduate Honors Theses Directed

- J. Wischmeyer, May 2023, advised with D. Myszka
“Design of an Electro-Pneumatic Control System for Soft Robotics Applications in Medicine and Industry”
- N. Michel, May 2020
“Designing Fictional Spaces: Questionable Architecture that Supports Sustainable Design”
- J. Ehren, May 2019, advised with D. Myszka
“Energy Analysis and Orbit Simulation of Actuating CubeSat Solar Arrays”
- E. McGill, May 2018, advised with D. Myszka
“Development of a Self-Orienting CubeSat Solar Array”
- T. Rolfe, Dec. 2017, advised with D. Myszka
“Design of a Shape-Changing Prosthetic Foot”
- L. Kozal, May 2017, advised with D. Myszka
“Development of an Opposed-Stroke, Diesel Engine for Utility Aircraft”
- D. Bell, May 2016, advised with D. Myszka
“Design and Prototyping of a Variable Geometry Extrusion Die to Exhibit Significant Alteration in Shape”
- P. Joyce, Dec. 2013, advised with D. Myszka
“Development of a Spring-Based Automotive Starter System”
- T. Schubert, May 2012, advised with D. Myszka
“Design, Prototyping, and Evaluation of an Elastically-Based Mechanical Starter for Automotive Engines”
- N. Direnzi, Dec. 2011, advised with D. Myszka
“The Use of Elastically-Based Mechanical Energy Storage in Motor Vehicles”
- M. Plecnik, May 2010, advised with D. Myszka
“Design of a Shape-Changing Rigid-Body Parabolic Light Reflector”
- T. Tarnacki, May 2003
“Future Impact of Current and Past Technological Advancements”
- J. Ramsier, May 2002
“The Techniques of Ancient Engineers”
- C. Schreier, Dec. 2001
“Synthesizing a Machine to Replace Robotics in Complex Motion Assembly Tasks”
- K. Kindbom, May 2001
“Influences of Geographically Dispersed Collaboration on the Future of Engineering Design”
- H. Stumph, May 1999
“Design of a Webpage to Facilitate the Learning of Machine Theory”

Graduate Student Committees

- R. Glavin, M.S., Dec. 2023, University of Dayton, R. Ordonez advisor
- J. Reinhart, M.S., Aug. 2021, University of Dayton, M. Rumpfkeil advisor
- A. Meem, M.S., Aug. 2021, University of Dayton, R. Lowe advisor
- J. Wernet, M.S., Aug. 2021, University of Dayton, A. Kinney advisor
- A. Yu, Ph.D., Dec. 2021, Ryerson University, F. Xi advisor
- M. Nellis, M.S., May 2020, University of Dayton, T. Reissman advisor
- L. Funke, Ph.D., May 2017, University of Notre Dame, J. Schmiedeler advisor
- A. González de Alba, Ph.D., Dec. 2014, Université Montpellier 2, M. Hayashibe & P. Fraise advisors
- K. Zhao, Ph.D., Dec. 2013, University of Notre Dame, J. Schmiedeler advisor
- J. Lauden, M.S., May 2013, University of Dayton, D. Myszka advisor
- A. Jennings, Ph.D., Aug. 2012, University of Dayton, R. Ordonez advisor
- B. O’Grady, M.S., Aug. 2010, University of Dayton, J. Joo advisor
- S-Y. Kim, Ph.D., Aug. 2007, University of Dayton, M. Daniels advisor
- V. Nabat, Ph.D., Mar. 2007, Université Montpellier 2, F. Pierrot advisor
- T. Mandourah, Ph.D., Oct. 2004, University of Dayton, A.R. Kashani advisor
- S. Shaikh, M.S., May 2004, University of Dayton, M. Turner advisor
- A. S. Mohammed, M.S., Aug. 2001, University of Dayton, A.R. Kashani advisor
- A. Mazdeh, M.S., Aug. 2000, University of Dayton, A.R. Kashani advisor

Professional Service Activities

- **ASME Design Engineering Division**
2018-2020 Mechanisms and Robotics Committee, Awards Committee, Past Chair
2016-2018 Mechanisms and Robotics Committee, Awards Committee, Chair
2015 Mechanisms and Robotics Conference: Theoretical and Computational Kinematics Symposium Chair
2013-2016 Mechanisms and Robotics Conference, Paper Awards Committee, member
2010 International Design Engineering Technical Conferences, General Conference Program Chair
739 accepted papers spanning 9 conferences
2009 Mechanisms and Robotics Conference, Program Chair
137 accepted papers
Mechanisms and Robotics Committee Treasurer, 2004-2008
Student Affairs Subcommittee Vice Chair, 2002-2007
2007 Mechanisms and Robotics Conference: Medical Devices and their Applications Symposium Co-Chair
2006 International Design Engineering Technical Conferences Exhibits Chair
2005 Mechanisms and Robotics Conference: Mechanism Synthesis, Components and Applications Symposium Co-Chair
2004 Mechanisms and Robotics Conference: Mechanism Synthesis, Components and Applications Symposium Co-Chair
2002 Mechanisms and Robotics Conference: Chair of Interactive Presentations
- **ASME member** since 1998, **ASME fellow** since 2014
- **ASME Journal of Mechanisms and Robotics**
Associate Editor, 2008-2015, 2017-2023
Awards and Technical Editor Advisory Committee, 2020-present
Guest Editor, "Special Issue: Selected Papers from the 41st Mechanisms and Robotics Conference at IDETC 2017"
Guest Editor, "Special Issue: Selected Papers from the 39th Mechanisms and Robotics Conference at IDETC 2015"
- **Inderscience International Journal of Mechanisms and Robotic Systems**
Guest Editor, "Special Issue: Invited Papers from the 2022 USCToMM Symposium on Mechanical Systems and Robotics"
Guest Editor, "Special Issue: Invited Papers from the 2020 USCToMM Symposium on Mechanical Systems and Robotics"
- **IEEE member** since 2015
IEEE/IFTToMM International Conference on Reconfigurable Mechanisms, Organizing Committee Co-Chair, 2021
IEEE/IFTToMM International Conference on Reconfigurable Mechanisms, Scientific Committee, 2024
- **USCToMM**, US division of IFTToMM (International Federation for the Promotion of Mechanisms and Machine Science)
Scientific Committee, member, 2019-present
- **Kinematics and Robot Design**, annual issue of MDPI robotics journal
Scientific Committee, member, 2019-present

University Service Activities

- **University of Dayton**
Faculty Board, School of Engineering Representative, 2022-2025
University of Dayton Research Council, 2016-2019
Habits of Inquiry and Reflection Practical Wisdom Working Group, 2015-2017
Distinguished Speaker Series Committee, 2011-2014
University of Dayton Graduate School Summer Fellowship Program Decision Committee, 2010, 2011, 2013
Search Committee, Dean of Students and Associate Vice President for Student Development, 2011
Search Committee, University Honors Program Director, 2010
Midterm Instructional Diagnostic facilitator, 2002-2014
Lilly Advisory Council, 2007-2010
Faculty Development Committee, 2001-2004, 2006-2009
Representative to Higher Learning Commission on Faculty Development, 2007
Co-Chair, 18th Annual Stander Symposium, 2006-2007
17th Annual Stander Symposium Steering Committee and Honors Convocation Subcommittee, 2005-2006
- **School of Engineering**
Undergraduate Studies Committee, 2020-present
Strategic Planning & Implementation Team, Invigorating Undergraduate Research Committee, 2016-2017

Search Committee, Dean of the School of Engineering, 2014
Innovation Minor Committee, 2012-2014
Design and Manufacturing Clinic Council, 2000-2011
Workload Committee, 2005-2006
Undergraduate Studies Committee, 2004-2006
Engineering Technology Peer Review of Faculty Committee, 2004-2005
Chair, General Education and Competencies Subcommittee on Math and Natural Sciences, 2003-2004
Chair, School of Engineering Awards for Excellence Committee, 2002
Chair, School of Engineering Committee to review math curriculum, 2001-2002
Task Force on Research and Graduate Studies, 1998-1999

- **Department of Mechanical & Aerospace Engineering**

Undergraduate academic advising, 28 advisees currently, 1997-present
Promotion, Tenure, Post-tenure and Sabbatical Review Committee, 2015-2022
Academic Misconduct Review Committee, Chair, 2019
Advisor, Pi Tau Sigma, 2000-2018
Mechanical Engineering Department Tenure-Track Faculty Search Committee (for 3 positions), 2015-2016
Hiring for Mission retreat, 2013
Chair, Mechanical Engineering Department Tenure-Track Faculty Search Committee, 2012
Sabbatical Review Committee, 2012
Peer Evaluator, Peer Assessment of Teaching Committee, 2012
Mechanical Engineering Department Lecturer Search Committee, 2011
Mechanical Engineering Department Tenure-Track Faculty Search Committee, 2008
Mechanical Engineering Department Tenure-Track Faculty Search Committee, 2001
Have participated in:
Women in Engineering, Open House, Career Awareness Day, Explore Engineering,
Minority Engineering Program Open House, Wright Scholars Summer Program, Summer Honors Institute