

Eleonora M. Botta

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Education

- 2013 - 2017 McGill University Montreal, Canada
Ph.D. in Mechanical Engineering (GPA: 4.0).
Thesis: Deployment and capture dynamics of tether-nets for active space debris removal.
Supervisors: Prof. Arun K. Misra, Prof. Inna Sharf.
- 2010 - 2013 Politecnico di Milano Milano, Italy
Laurea Specialistica (M.Eng. with thesis) in Space Engineering (Final grade: 110/110).
- 2010 - 2013 Politecnico di Torino Torino, Italy
Laurea Specialistica (M.Eng. with thesis) in Aerospace Engineering.
- 2010 - 2013 Alta Scuola Politecnica Milano-Torino, Italy
Diploma. Excellence program in innovation and multidisciplinary.
- 2011 - 2012 Institut Supérieur de l'Aéronautique et de l'Espace (ISAE SUPAERO) Toulouse, France
ERASMUS international program. Space Systems / Control Systems.
- 2007 - 2010 Politecnico di Milano Milano, Italy
Laurea (B.Eng.) in Aerospace Engineering (Final grade: 109/110).

Professional Experience

- 2019 – Present **Assistant Professor.** Department of Mechanical and Aerospace Engineering, University at Buffalo.
- 2018 **Postdoctoral Fellow.** Department of Mechanical Engineering, McGill University / GlobVision.
Advancing capabilities of software for Space Situational Awareness.
- 2013 – 2017 **Research Assistant.** Department of Mechanical Engineering, McGill University.
Deployment and capture dynamics of tether-nets for active space debris removal.
- 2014 **Research Assistant.** Department of Mechanical Engineering, McGill University.
Development of the dynamical model of a three-revolute spherical wrist.

Citation Summary

- Google Scholar** (as of July 25, 2023) [link](#) Citations: 438 | h-index: 10 | i10-index: 10
- Web of Science** (as of July 25, 2023) [link](#) Citations: 216 | h-index: 6
- Scopus** (as of July 25, 2023) [link](#) Citations: 320 | h-index: 7
- ORCID:** orcid.org/0000-0001-8983-2927 **ResearcherID:** AAF-1884-2020

Publications

Refereed journal articles

(Corresponding author underlined; * denotes E.M. Botta's graduate student; + denotes E. M. Botta's undergraduate student)

- J15. C. Zeng, G. Hecht*, S. Chowdhury, **E. M. Botta**. *Concurrent Design Optimization of Tether-Net System and Actions for Reliable Space-Debris Capture*. Submitted to the Journal of Spacecraft and Rockets.
- J14. G. Hecht*, **E.M. Botta**. *Distributed Swarm Optimization for the Solution of Boundary Value Problems in Astrodynamics*. Submitted to the Journal of the Astronautical Sciences.
- J13. L. Field*, **E. M. Botta**. *Relative Distance Control of Uncooperative Tethered Debris*. Submitted to the Journal of the Astronautical Sciences.
- J12. A.Boonrath*, **E. M. Botta**. *Validation of Models for Net Deployment and Capture Simulation with Experimental Data*. Revised version under review for the Journal of Spacecraft and Rockets.
- J11. D. Bourabah*, C. Gnam, E. M. Botta. *Inertia Tensor Estimation of Tethered Debris through Tether Tracking*. Revised version under review for Acta Astronautica.
- J10. G. Hecht*, **E.M. Botta**. *Particle Swarm Optimization-Based Co-State Initialization for Low-Thrust Minimum-Fuel Trajectory Optimization*. Vol. 211 (2023), pp. 416–430. DOI: [10.1016/j.actaastro.2023.06.021](https://doi.org/10.1016/j.actaastro.2023.06.021)
- J9. D. Bourabah*, L. Field*, **E. M. Botta**. *Estimation of Uncooperative Space Debris Inertial Parameters after Tether Capture*. Acta Astronautica. Vol. 202 (2023), pp. 909-926. DOI: [10.1016/j.actaastro.2022.07.041](https://doi.org/10.1016/j.actaastro.2022.07.041)
- J8. D. Bourabah*, **E.M. Botta**. *Length-Rate Control for Libration Reduction during Retraction of Tethered Satellite Systems*. Acta Astronautica. Vol. 201 (2022), pp. 152-163. DOI: [10.1016/j.actaastro.2022.08.037](https://doi.org/10.1016/j.actaastro.2022.08.037)
- J7. C. Barnes+, **E.M. Botta**. *A Quality Index for Net-Based Capture of Space Debris*. Acta Astronautica. Vol. 176 (2020), pp. 455-463. DOI: [10.1016/j.actaastro.2020.06.044](https://doi.org/10.1016/j.actaastro.2020.06.044)
- J6. **E.M. Botta**, C. Miles, and I. Sharf. *Simulation and Tension Control of a Tether-Actuated Closing Mechanism for Net-Based Capture of Space Debris*. Acta Astronautica. Vol. 174 (2020), pp. 347-358. DOI: [10.1016/j.actaastro.2020.04.052](https://doi.org/10.1016/j.actaastro.2020.04.052)
- J5. **E.M. Botta**, I. Sharf, and A.K. Misra. *Simulation of Tether-Nets for Capture of Space Debris and Small Asteroids*. Acta Astronautica. Vol. 155 (2019), pp. 448-461. DOI: [10.1016/j.actaastro.2018.07.046](https://doi.org/10.1016/j.actaastro.2018.07.046)
- J4. **E.M. Botta**, I. Sharf, and A.K. Misra. *Energy and Momentum Analysis of the Deployment Dynamics of Nets in Space*. Acta Astronautica. Vol. 140 (2017), pp. 554-564. DOI: [10.1016/j.actaastro.2017.09.003](https://doi.org/10.1016/j.actaastro.2017.09.003)
- J3. I. Sharf, B. Thomsen, **E.M. Botta**, A.K. Misra. *Experiments and Simulation of a Net Closing Mechanism for Tether-Net Capture of Space Debris*. Acta Astronautica. Vol. 139 (2017), pp. 332-343. DOI: [10.1016/j.actaastro.2017.07.026](https://doi.org/10.1016/j.actaastro.2017.07.026)
- J2. **E.M. Botta**, I. Sharf, and A.K. Misra. *Contact Dynamics Modeling and Simulation of Tether Nets for Space-Debris Capture*. Journal of Guidance, Control, and Dynamics. Vol. 40, No. 1 (2017), pp. 110-123. DOI: [10.2514/1.G000677](https://doi.org/10.2514/1.G000677)
- J1. **E.M. Botta**, I. Sharf, M. Teichmann, and A.K. Misra. *On the Simulation of Tether-Nets for Space Debris Capture with Vortex Dynamics*. Acta Astronautica. Vol. 123 (2016), pp. 91-102. DOI: [10.1016/j.actaastro.2016.02.012](https://doi.org/10.1016/j.actaastro.2016.02.012)

Books

P. Freni, **E.M. Botta**, L. Randazzo, and P. Ariano. *Innovative Hand Exoskeleton Design for Extravehicular Activities in Space*. SpringerBriefs in Applied Sciences and Technology, 2014. ISBN 978-3-319-03958-9.

Conference papers

(Presenter name underlined; *denotes E.M. Botta's graduate student; + denotes E. M. Botta's undergraduate student)

- C26. G. Hecht*, **E. M. Botta**. *Q-Law Control with Sun Angle Constraint for Solar Electric Propulsion*. 2023 AAS/AIAA Astrodynamics Specialist Conference, Big Sky, MT, August 2023.
(Breakwell Award - Best Student Paper Award)
- C25. F. Liu, A. Boonrath*, P. KrishshnaKumar, **E. M. Botta**, S. Chowdhury. *Learning Constrained Corner Node Trajectories of a Tether Net System for Space Debris Capture*. 2023 AIAA AVIATION Forum, San Diego, June 2023.
- C24. A. Schultz+, **E. M. Botta**. *Comparison of Capture Quality Indices for Net-Based Capture of Zenit-2 Rocket*. AIAA Student Conference, Buffalo NY, March 2023.
- C23. L. Field*, **E. M. Botta**. *Relative Distance Control of Uncooperative Tethered Debris*. 33rd AAS/AIAA Space Flight Mechanics Meeting, Austin, TX, January 2023.
- C22. G. Hecht*, N. Furioso+, **E. M. Botta**. *Distributed Swarm Optimization for the Solution of Boundary Value Problems in Astrodynamics*. 33rd AAS/AIAA Space Flight Mechanics Meeting, Austin, TX, January 2023.
- C21. D. Bourabah*, C. Gnam, **E. M. Botta**. *Inertia Tensor Estimation of Tethered Debris through Tether Tracking*. 73rd International Astronautical Congress (IAC 2022), Paris, France, September 2022.
(Recommended for submission to Acta Astronautica special issue)
- C20. D. Bourabah*, L. Field*, **E. M. Botta**. *Estimation of Uncooperative Space Debris Inertial Parameters after Tether Capture*. 3rd IAA Conference on Space Situational Awareness (ICSSA), Madrid, Spain, April 2022.
(1st Place, Best Student Paper Award,
Recommended for submission to Acta Astronautica special issue)
- C19. C. Zeng, G. Hecht*, R. Shah*, P. Kumar, S. Chowdhury, **E. M. Botta**. *Learning Robust Policies for Generalized Debris Capture with an Automated Tether-Net System*. 2022 AIAA SciTech Forum, San Diego, CA, January 2022.
- C18. G. Hecht*, **E. M. Botta**. *Heuristic Optimization Algorithms for Initializing Indirect Minimum-Fuel Trajectory Optimization*. 2022 AIAA SciTech Forum, San Diego, CA, January 2022.
- C17. C. Woods+, A. Boonrath+, R. Gold+, **E. M. Botta**. *Validation of Simulation of Space Net Deployment and Target Capture with Parabolic Flight Experiment Data*. 2022 AIAA SciTech Forum, San Diego, CA, January 2022. DOI: [10.2514/6.2022-1773](https://doi.org/10.2514/6.2022-1773)
- C16. D. Yu+, A. Judasz+, M. Zheng, **E. M. Botta**. *Design and Testing of a Net-Launch Device for Drone Capture*. 2022 AIAA SciTech Forum, San Diego, CA, January 2022.
- C15. S. Chen+, C. Woods+, A. Boonrath+, **E. M. Botta**. *Analysis of the robustness and safety of net-based debris capture*. 2022 AIAA SciTech Forum, San Diego, CA, January 2022.
- C14. D. Bourabah*, **E. M. Botta**. *Exploiting Coriolis Acceleration to Reduce Libration Oscillations during Retraction of Tethered Satellite Systems*. 72nd International Astronautical Congress (IAC 2021), Dubai, UAE, October 2021.
- C13. G. Hecht*, **E. M. Botta**. *Co-State Initialization with Particle Swarm Optimization for Low-Thrust Minimum-Fuel Trajectory Optimization*. 2021 AAS/AIAA Astrodynamics Specialist Conference, Virtual Meeting, August 2021.
- C12. R. K. Shah*, C. Zeng, **E. M. Botta**, S. Chowdhury. *Reliability-Based Launch and Closure Optimization for a Net-Based Space Debris Capture System*. 2021 AIAA AVIATION Forum, Virtual Meeting, August 2021.
- C11. D. Bourabah*, **E.M. Botta**. *Libration Reduction during Partial Satellite Retrieval of Vertical Three-Mass Tethered Systems*. 31st AAS/AIAA Space Flight Mechanics Meeting, Virtual Meeting, February 2021.

- C10. C. Barnes⁺, **E.M. Botta**. *An Improved Quality Index for Net-Based Capture of Space Debris*. 2nd IAA Conference on Space Situational Awareness (ICSSA). Arlington, VA. January 2020.
(1st Place, Best Student Paper Award)
- C9. N. Ravichandra⁺, **E.M. Botta**. *Output Space Mapping for Net-Based Debris Capture*. 2020 AIAA SciTech Forum and Exposition. Orlando, FL, January 2020.
- C8. C. Miles, **E.M. Botta**, and I. Sharf. *Simulation and Tension Control of a Tether-Actuated Closing Mechanism for Net-Based Capture of Space Debris*. 70th International Astronautical Congress (IAC 2019). Washington D.C., October 2019.
- C7. R. Gold⁺, **E.M. Botta**. *Validation of a Simulation Tool for Net-Based Capture of Debris with Parabolic Flight Experiment Data*. 2019 AAS/AIAA Astrodynamics Specialist Conference. Portland, ME. August 2019.
- C6. **E.M. Botta**, I. Sharf, and A.K. Misra. *Simulation of Tether-Nets for Capture of Space Debris and Small Asteroids*. 1st IAA Conference on Space Situational Awareness (ICSSA). Orlando, FL. November 2017.
- C5. **E.M. Botta**, I. Sharf, and A.K. Misra. *Tether-Nets for Active Space Debris Removal: Effect of the Tether on Deployment and Capture Dynamics*. 27th AAS/AIAA Space Flight Mechanics Meeting. San Antonio, TX. February 2017. AAS 17-387.
- C4. **E.M. Botta**, I. Sharf, and A.K. Misra. *Energy and Momentum Considerations in the Deployment Dynamics of Nets for Active Space Debris Removal*. 67th International Astronautical Congress. Guadalajara, Mexico. September 2016. IAC-16-A6.5.6
- C3. **E.M. Botta**, I. Sharf, and A.K. Misra. *Evaluation of Net Capture of Space Debris in Multiple Mission Scenarios*. 26th AAS/AIAA Space Flight Mechanics Meeting. Napa, CA. February 2016. AAS 16-254.
- C2. **E.M. Botta**, I. Sharf, M. Teichmann, and A.K. Misra. *On the Simulation of Tether-Nets for Space Debris Capture with Vortex Dynamics*. 66th International Astronautical Congress. Jerusalem, Israel. October 2015. IAC-15-A6.5.6
- C1. **E.M. Botta**, I. Sharf, and A.K. Misra. *On the Modeling and Simulation of Tether-Nets for Space Debris Capture*. 25th AAS/AIAA Space Flight Mechanics Meeting. Williamsburg, VA. January 2015. AAS 15-260.

Theses

E.M. Botta. *Deployment and Capture Dynamics of Tether-Nets for Active Space Debris Removal*. Ph.D. Thesis, McGill University, 2017. Department of Mechanical Engineering.

E.M. Botta. *A Multidisciplinary Tool for the Combined Optimization of Manned Atmospheric Entry Vehicles and Their Trajectory*. Master's Thesis, Politecnico di Milano, 2013. Department of Aerospace Science and Technology.

Technical Presentations

Invited talks

- T9. *Simulation and control of autonomous tethered spacecraft and tether-nets*. Politecnico di Torino, June 16, 2023.
- T8. *Simulation and control of autonomous tethered spacecraft and tether-nets*. NASA Jet Propulsion Laboratory, November 28, 2022.
- T7. WiSE and Shine Breakfast Meetup, UB Women in Science and Engineering, University at Buffalo, February 9, 2022.
- T6. *What Does Innovation Look Like Now? Course Innovations Brought About by the Online Learning Experience*, UB Women in STEM Cooperative Webinar Series: Helping STEM Students Thrive, November 18, 2021.

- T5. *Dynamics and Control of Capturing Space Debris with Tether-Nets*, Department of Mechanical and Aerospace Engineering Seminar Series, University of Strathclyde, May 26, 2021.
- T4. *Dynamics and Control of Capturing Space Debris with Tether-Nets*, Department of Mechanical and Aerospace Engineering Seminar Series, Syracuse University, April 16, 2021.
- T3. *Dynamics and Control of Tether-Nets for Active Space Debris Removal*, UB Alumni Academy #6: The Space Race, March 22, 2021.
- T2. *Dynamics and Control of Tether-Nets for Active Space Debris Removal*, Department of Aerospace Engineering and Mechanics Seminar Series, University of Minnesota, October 9, 2020.
- T1. *Deployment and Capture Dynamics of Tether-Nets for Active Space Debris Removal*, The Daniel Guggenheim School of Aerospace Engineering Seminar Series, GeorgiaTech, October 30, 2017.

Conference abstracts (that do not appear in the conference papers section, presenter name underlined; *denotes E.M. Botta's graduate student.)

- A7. E.M. Botta, D. Bourabah*, C. Gnam. *Inertia Tensor Estimation of Tethered Debris through Tether Tracking*. 2nd International Stardust Conference, ESTEC, Noordwijk, November 2022
- A6. E.M. Botta, D. Bourabah*, L. Field*. *Post-capture estimation and control of tethered space debris*. 6th International Workshop on Space Debris Modelling and Remediation. Milan, Italy. May 2022.
- A5. L. Field*, E.M. Botta. *Effect of Tether Discretization on Target Debris Attitude Motion*. Stardust-R – Second Global Virtual Workshop. Remote. September 2021.
- A4. C. Zeng, R. K. Shah*, E.M. Botta, S. Chowdhury. *Optimizing the Process of Net-Based Active Capture of Rotating Space Debris*. Stardust-R – Second Global Virtual Workshop. Remote. September 2021.
- A3. R. K. Shah*, C. Zeng, S. Chowdhury, E.M. Botta. *Learning-Augmented Optimal Deployment of Net for Reliable Capture of Space Debris*. International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS 2020). Remote. October 2020.
- A2. E.M. Botta, I. Sharf, and A.K. Misra. *Modeling and simulation of the deployment and capture phases of a net-based Active Debris Removal mission*. 4th International Workshop on Space Debris Modelling and Remediation. Paris, France. June 2016.
- A1. E.M. Botta, I. Sharf, and A.K. Misra. *A simulation tool for the deployment and capture dynamics of nets for space debris removal*. CASI ASTRO 2016. Ottawa, ON. May 2016.

Grants

Total Amount Awarded: \$686,573 Own Share: \$ 430,786

Modeling, Design and Operation of Robotic Tether-Net Systems for Reliable Capture of Targets

PI: Eleonora M. Botta, Co-PI: Souma Chowdhury, NSF, 09/01/21 – 09/01/24, \$503,573 (50% share).
REU Supplement: \$8,000

CRII: FRR: Robotic cable-based de-tumbling of demised spacecraft

PI: Eleonora M. Botta, NSF, 09/01/21 – 09/01/23, \$175,000 (100% share).

Digital Media & Online Features

1. [Botta is interviewed for podcast ‘Rumors d’ambiente’](#) (August 2022)
2. [Botta’s PhD student wins best paper award at international space conference](#) (May 2022)
3. [Botta is a panelist in the Webinar Series: Helping STEM Students Thrive](#) (Nov. 2021)
4. [Engineer studies net-shooting robots that corral space debris](#) (Aug. 2021)
5. [How Do We Minimize The Threat Of Space Collisions? This Engineer Might Have The Answer](#) (Aug. 2021)
6. [Botta awarded NSF grant to model how tether systems could remove debris from low Earth orbit](#) (Aug. 2021)
7. [Botta presents at the UB Alumni Academy: Spring Semester 2021](#) (March 2021).
8. [Botta’s student wins first place at the 2020 WE Local Des Moines Collegiate Competition](#) (Aug. 2020)
9. [Botta’s undergraduate student recognized for outstanding scholarship](#) (Aug. 2020)
10. [Botta’s undergraduate student wins best paper award at international conference](#) (Feb. 2020)
11. [GAMES 2016 Oral Session 1st Place Prize Recipient, Eleonora Botta](#) (June 2016)
12. [Meet the 2015 Amelia Earhart Fellows](#) (June 2015)

Honors and Awards

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| 2022 | SEAS Early Career Teacher of the Year Award. <i>School of Engineering and Applied Sciences, University at Buffalo, NY.</i> |
| 2018 | Outstanding Teaching Assistant Award. <i>Faculty of Engineering, McGill University, Canada.</i> |
| 2017 | Second place, oral presentation competition. <i>Department of Mech. Eng., McGill University, Canada.</i> 2 nd McGill Mechanical Engineering Graduate Research Day. |
| 2016 | First place, oral presentation competition. <i>Department of Mech. Eng., McGill University, Canada.</i> 1 st McGill Mechanical Engineering Graduate Research Day. |
| 2015 | Amelia Earhart Fellowship. <i>Zonta International.</i> |
| 2013 - 2016 | McGill Engineering Doctoral Award (MEDA). <i>Faculty of Engineering, McGill University, Canada.</i> |
| 2013 – 2016 | Werner Graupe International Fellowship in Engineering. <i>Antje Graupe Pryor Foundation, Canada.</i> |
| 2010, 2013 | Giovanni Zampese Award. <i>Banca di Credito Cooperativo Cantù, Italy.</i> |
| 2013 | Scholarship for thesis carried out abroad. <i>Politecnico di Milano, Italy.</i> |
| 2011 - 2012 | ERASMUS scholarship. <i>European Union / Italy Ministry of Education.</i> |
| 2007 - 2012 | Tuition fees waiver. <i>Politecnico di Milano / Alta Scuola Politecnica, Italy.</i> |

Teaching Experience

Courses taught: *Department of Mechanical and Aerospace Engineering, University at Buffalo.*

- Vibration & Shock (MAE 467/567 LEC):

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|-----------|------------------------|-------|------------------------|
| Fall 2022 | Instructor Evaluation: | 4.9/5 | (Dept. Average: 4.3/5) |
| | Overall Course: | 4.5/5 | (Dept. Average: 3.7/5) |
| | Response Rate: | 16/18 | |

- Orbital Mechanics (MAE 502 LEC): Newly developed course.

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| Fall 2022 | Instructor Evaluation: | 4.6/5 | (Dept. Average: 4.3/5) |
| | Overall Course: | 4.3/5 | (Dept. Average: 3.7/5) |
| | Response Rate: | 9/11 | |
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| Fall 2021 | Instructor Evaluation: | 4.4/5 | (Dept. Average: 4.2/5) |
| | Overall Course: | 4.3/5 | (Dept. Average: 3.8/5) |
| | Response Rate: | 6/8 | |
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| Fall 2020 | Instructor Evaluation: | 4.4/5 | (Dept. Average: 4.2/5) |
| | Overall Course: | 4.4/5 | (Dept. Average: 3.9/5) |
| | Response Rate: | 8/8 | |
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| Fall 2019 | Instructor Evaluation: | 4.2/5 | (Dept. Average: 4.2/5) |
| | Overall Course: | 4.1/5 | (Dept. Average: 3.7/5) |
| | Response Rate: | 9/10 | |

- Dynamics (EAS 208).

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|-------------|------------------------|-------|------------------------|
| Spring 2022 | Instructor Evaluation: | 4.4/5 | (Dept. Average: 4.3/5) |
| | Overall Course: | 3.9/5 | (Dept. Average: 4.0/5) |
| | Response Rate: | 20/49 | |
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| Spring 2020 | Overall Course: | 3.9/5 | |

- Graduate Seminar (MAE 503).

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| Fall 2022 | Instructor Evaluation: | 4.5/5 | |
| | Overall Course: | 4.3/5 | |
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| Spring 2022 | Instructor Evaluation: | 4.5/5 | |
| | Overall Course: | 4.3/5 | |
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| Fall 2021 | Instructor Evaluation: | 4.5/5 | |
| | Overall Course: | 4.1/5 | |

Teaching assistant. *Department of Mechanical Engineering, McGill University.*

- Mechanics 3 (MECH 315): Vibrations. Fall 2014, Fall 2015, Winter 2017.
- Mechanics 2 (MECH 220): Kinematics and Dynamics of Particles and Rigid Bodies. Summer 2015, Winter 2016, Fall 2016.
- System Dynamics and Control (MECH 412). Winter 2015, Fall 2015.

Grader. *Department of Mechanical Engineering, McGill University.*

- Spacecraft Dynamics (MECH 542). Fall 2016.
- Introduction to Robotics (MECH 572). Fall 2014.
- System Dynamics and Control (MECH 412). Winter 2014.

Research advising

Ph.D. research at UB.

- Liam Field, Ph.D., August 2022-present, degree expected May 2025.
- Achira Boonrath, Ph.D., August 2022-present, degree expected May 2027.
Presidential Fellow, 2022-2025
3rd place, 2023 UB MAE Graduate Student Poster Competition.
- Derek Bourabah, Ph.D., August 2021-present, degree expected May 2024.
ICSSA Best Student Paper 1st Place Award, 2022.
UB NASA Space Grant Award, 2022.
- Grant Hecht, Ph.D., August 2020-present, degree expected May 2026.
National Science Foundation (NSF) Graduate Research Fellow, 2023-2026.
NASA Pathways Intern, 2021-2022.
UB NASA Space Grant Award, 2022.
2nd place, 2023 UB MAE Graduate Student Poster Competition.
Breakwell Award - Best Student Paper Award at 2023 AIAA/AAS Astrodynamics Specialist Conf.

Master's research at UB.

- Liam Field, M.S., August 2020-August 2022, Graduated.
Thesis: Modeling, Simulation, and Control of Tethered Space Debris.
- Derek Bourabah, M.S., August 2019-August 2021, Graduated.
Thesis: Effectiveness of Utilizing only Tether Length Rate During the Retrieval of Tethered Satellites.
- Raj Kalpeshkumar Shah, M.S., August 2020-August 2021, Graduated.
Thesis: Computational Pipeline to Find Optimal Launch and Closure Strategy for Autonomous Tether-Net Space Debris Capture System.

Dissertations/Theses committee member

- Mohamed Mousa, Ph.D. degree expected 2026.
- Andrew Swenson, Ph.D. degree expected 2025.
- Christopher Gnam, Ph.D. degree expected 2023.
- Stephen Gagnon, Ph.D. degree expected 2023.
- Sharan Vijayaragavan, M.S. degree, May 2023.
- Revant Adlakha, Ph.D., May 2023.
- Chen Zeng, Ph.D., May 2022.
- Jeremy Chapman, Ph.D., February 2022.
- Steve Szklany, Ph.D., February 2022.
- Hadarou Sare, M.S. degree, 2021.
- Chuan Hsin (Cindy) Chang, M.S., May 2020.

Undergraduate research at UB.

- Haley Parker, Spring 2023
Bauer Foundation WiSE Experiential Learning Fund, 2023.
- Alexa Schultz, Fall 2022-Spring 2023.
Best Student Paper 2nd Place, AIAA Student Conf., 2023.
- Nick Furioso, Summer 2022-Fall 2022
- Lauren Sullivan, Spring 2022-Summer 2022.
UB NASA Space Grant Award, 2022.

- Iain Tierney, Spring 2021-Fall 2021. (Computer Science)
- Stephen Chen, Summer 2020-Summer 2021.
- Derek Yu, Summer 2020-Spring 2022. ELN Funding Recipient, Spring 2021.
- Achira Boonrath, Summer 2020-Spring 2022. Zimmer Award Recipient, Spring 2021.
ELN Conference Funding Recipient, Fall 2021.
UB Excellence in Research, Scholarship & Creativity Award, 2022.
Dean’s Undergraduate Achievement Award, 2022.
- Cailean Woods, Spring 2020-present. ELN Conference Funding Recipient, Fall 2021.
UB NASA Space Grant Award, 2022.
UB Excellence in Research, Scholarship & Creativity Award, 2022.
- Andrea Judasz, Summer 2020-Spring 2021. ELN Funding Recipient, Spring 2021.
- Charles Barnes, Fall 2019-Spring 2020. ELN Conference Funding Recipient, Fall 2019.
ICSSA Best Student Paper 1st Place Award, 2020.
Dean’s Undergraduate Achievement Award, 2020.
- Liam Field, Spring 2019-Summer 2020.
- Rachael Gold, Spring 2019-Summer 2020. Zimmer Award Recipient, Fall 2019.
1st place, Undergraduate collegiate competition, WE Local Des Moines, 2020.
- Niranjan Ravichandra, Spring 2019.
- Derek Bourabah, Spring 2019.

Undergraduate research at McGill University.

Corey Miles. Simulation and Control of a Tether-Actuated Closing Mechanism for Net-Based Capture of Space Debris. Co-supervisor with Prof. Inna Sharf. 2018-2019.

Professional Development

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|----------------|---|
| September 2021 | Best Practices for Conducting Searches to Hire Staff. UB EDGE. |
| August 2020 | Design and Build an Online Course. UB Center for Educational Innovation (CEI). |
| October 2019 | Designing Experiences Academy. UB Center for Educational Innovation (CEI). |
| September 2019 | Making an Effective Syllabus. UB Center for Educational Innovation (CEI). |
| August 2019 | Write Winning Grant Proposals. UB Office of Research Advancement. |
| Spring 2019 | New Faculty Academy: writing/publishing. UB University Libraries. |
| February 2019 | Supervising the UB way. UB Organizational Development and Training. |
| January 2019 | Research Fundamentals Workshop. UB Office of Research Advancement. |
| 2017 | Teaching Techniques for Instructors Workshop. McGill T-PULSE. |

- 2017 **Graduate Teaching Development Workshop.** McGill T-PULSE.
- 2014 **AGSEM Teaching Assistant Training.** SKILLSETS – McGill University.

Service

- **Society Membership**
 - American Institute of Aeronautics and Astronautics, AIAA (2019 – Present).
Member of Space Tethers Technical Committee (2019-Present), Vice-chair (2022-Present).
 - American Astronautical Society, AAS (2016 – Present).
Member of the Space Flight Mechanics Committee (2022-Present).
 - Research Associate at the Buffalo Museum of Science (2022 – Present).
- **School & Departmental Service, UB**
 - MAE Graduate Seminar Series coordinator (2021-2023).
 - DEE Faculty hiring committee member (2021).
 - MAE DC Faculty hiring committee member (2019-2020).
 - Judge for UB MAE Graduate Poster Competition (2019, 2020, 2023).
 - Participation into ABET evaluation of Mechanical Engineering program (2020).
- **Reviewer for Proposals**
 - NSF Graduate Research Fellowships Program Reviewer.
 - Mitacs Reviewer.
 - National Science Foundation Reviewer 2021, 2022.
 - National Aeronautics and Space Administration Reviewer 2020.
- **Editor for Scientific Journals**
 - Guest Editor: Acta Astronautica, Special Issue (2020).
 - International Journal of Space Science and Engineering (2019 – Present).
- **Reviewer**
 - Journal of Guidance, Control, and Dynamics, AIAA. Nominated as Excellent Reviewer of JGCD in 2018, 2020, 2022.
 - Acta Astronautica, Elsevier.
 - Nonlinear Dynamics, Springer.
 - IEEE Transactions on Aerospace and Electronic Systems.
 - IEEE Access.
 - Journal of Spacecraft and Rockets, AIAA.
 - Communications in Nonlinear Science and Numerical Simulation, Elsevier .
 - Advances in Space Research, Elsevier.
 - Transactions of JSASS, Aerospace Technology Japan.
 - International Journal of Astronautics and Aeronautical Engineering.
 - 2017 IEEE/RSI International Conference On Intelligent Robots And Systems (IROS 2017).
 - 57th IEEE Conference on Decision and Control (CDC 2018).
 - International Conference on Mechanical, Electric and Industrial Engineering (MEIE 2018).
 - 2020 IEEE Conference on Control Technology and Applications (CCTA).

- ASCEND 2020 (topics: Transformative Research and Technology, Space Traffic Management and Integration, Defining the Space Economy, Space Exploration Architectures and Enabling Infrastructures).
- 61th IEEE Conference on Decision and Control (CDC 2022)
- AAS/AIAA Astrodynamics Specialist Conference, 2023
- AAS/AIAA Space Flight Mechanics Meeting, 2024
- **Conference Organization**
 - **Technical Discipline Chair**
 - “Space Tethers”, SciTech 2024.
 - **Session Chair**
 - Track “Modeling - Collision Avoidance”, 6th International Workshop on Space Debris Modelling and Remediation. Milan, Italy. May 19, 2022.
 - Track “Future missions & trends”, Stardust-R – Second Global Virtual Workshop. September 17, 2021.
 - Track “Tethered Spacecraft Structure”, AIAA ASCEND 2020. November 19, 2020.
 - Tracks “Tracking” and “Risk Assessment”, 2nd IAA Conference on Space Situational Awareness (ICSSA). January 15, 2020.
- **Awards Committees**
 - Judge Bauer Family Foundation to support undergraduate students in Women in Science and Engineering (WiSE) with expenses in pursuit of experiential learning activities, UB (2021-Present).
 - Judge AIAA Abe M. Zarem Award for Distinguished Achievement (2019, 2020).
- **Mentorship**
 - UB Clear Constellation Mentor (2021).
 - Mentor, International Astronautical Federation (IAF) Abstract Mentor Programme, IAC 2020.
 - SEAS Faculty-Freshman Mentor (Spring 2019, 2020, 2021, 2022, 2023).
- **Community Outreach and Engagement**
 - Participation in the activities of UB Women in Science and Engineering: Award committee, Speaker at WiSE and Shine Breakfasts (February 9, 2022), Outreach at Leonardo da Vinci High School (September 21, 2022).
 - Science is Elementary Mentor (2019 – 2020).
- **Participation to accreditation process of the Mechanical Engineering program at McGill University.**
- **Volunteer at conferences.**
 - 17th Astronautics Conference of the Canadian Aeronautics and Space Institute (CASI ASTRO 2016).
 - 12th International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS 2014).

Communication

Languages

English, French

Fluent.

Italian

Mother tongue.