

Eleonora M. Botta

Assistant Professor, Department of Mechanical and Aerospace Engineering
1005 Furnas Hall, University at Buffalo, Buffalo NY 14260
Phone: 716-645-2802
E-mail: ebotta@buffalo.edu
LinkedIn: ca.linkedin.com/in/eleonorabotta

Education

2013 - 2017	McGill University 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.	Montreal, Canada
2010 - 2013	Politecnico di Milano Laurea Specialistica (M.Eng. with thesis) in Space Engineering (Final grade: 110/110).	Milano, Italy
2010 - 2013	Politecnico di Torino Laurea Specialistica (M.Eng. with thesis) in Aerospace Engineering.	Torino, Italy
2010 - 2013	Alta Scuola Politecnica Diploma. Excellence program in innovation and multidisciplinary.	Milano-Torino, Italy
2011 - 2012	Institut Supérieur de l'Aéronautique et de l'Espace (ISAE SUPAERO) ERASMUS international program. Space Systems / Control Systems.	Toulouse, France
2007 - 2010	Politecnico di Milano Laurea (B.Eng.) in Aerospace Engineering (Final grade: 109/110).	Milano, Italy

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 August 5, 2024) link	Citations: 638 h-index: 11 i10-index: 13
Web of Science (as of August 5, 2024) link	Citations: 301 h-index: 7
Scopus (as of August 5, 2024) link	Citations: 455 h-index: 8
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)

- J19. A.Boonrath*, T. Singh, **E. M. Botta**. *Identification of Parameters for Tethered Satellite System to Emulate Net-Captured Debris Towing*. Submitted to Acta Astronautica.
- J18. D. Bourabah*, C. Gnam, **E. M. Botta**. *Post-Capture Tethered-Debris Principal Moment of Inertia Estimation via Pinhole Camera Model with Occlusion*. Submitted to Journal of the Astronautical Sciences.
- J17. D. Bourabah*, L. Field*, **E.M. Botta**. *Online Control and Moment of Inertia Estimation of Tethered Debris*. Under revision for publication in the Journal of Guidance, Control, and Dynamics.
- J16. G. Hecht*, **E.M. Botta**. *Q-Law Control With Sun-Angle Constraint for Solar Electric Propulsion*. Accepted for publication in IEEE Transactions on Aerospace and Electronic Systems.
- J15. C. Zeng, G. Hecht*, S. Chowdhury, **E. M. Botta**. *Concurrent Design Optimization of Tether-Net System and Actions for Reliable Space-Debris Capture*. Journal of Spacecraft and Rockets. Published online. DOI: [10.2514/1.A35812](https://doi.org/10.2514/1.A35812)
- J14. A.Boonrath*, **E. M. Botta**. *Validation of Models for Net Deployment and Capture Simulation with Experimental Data*. Journal of Spacecraft and Rockets. Vol. 61, No. 1 (2024), pp. 181-199. DOI: [10.2514/1.A35798](https://doi.org/10.2514/1.A35798)
- J13. L. Field*, **E. M. Botta**. *Relative Distance Control of Uncooperative Tethered Debris*. Journal of the Astronautical Sciences. Vol.70, 55 (2023). DOI: [10.1007/s40295-023-00422-7](https://doi.org/10.1007/s40295-023-00422-7)
- J12. G. Hecht*, **E.M. Botta**. *Distributed Swarm Optimization for the Solution of Boundary Value Problems in Astrodynamics*. Journal of the Astronautical Sciences. Vol.70, 56 (2023). DOI: [10.1007/s40295-023-00421-8](https://doi.org/10.1007/s40295-023-00421-8)
- J11. D. Bourabah*, C. Gnam, **E. M. Botta**. *Inertia Tensor Estimation of Tethered Debris through Tether Tracking*. Acta Astronautica. Vol. 212 (2023), pp. 643-653. DOI: [10.1016/j.actaastro.2023.08.021](https://doi.org/10.1016/j.actaastro.2023.08.021)
- J10. G. Hecht*, **E.M. Botta**. *Particle Swarm Optimization-Based Co-State Initialization for Low-Thrust Minimum-Fuel Trajectory Optimization*. Acta Astronautica. 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)

- C38. L. Field*, G. Hecht*, E. M. Botta. *Successive Convexification-Based Model Predictive Control for Tethered Debris Deorbiting*, 75th International Astronautical Congress (IAC 2024). To be presented.
- C37. G. Hecht*, E. M. Botta. *Automated Computation of Optimal Spiral Trajectories in the Circular Restricted Three-Body Problem*, 75th International Astronautical Congress (IAC 2024). To be presented.
- C36. D. LaSalle+, G. Hecht*, E. M. Botta. *Solar Sailing Q -Law using Keplerian Orbital Elements*, 2024 AAS/AIAA Astrodynamics Specialist Conference. To be presented.
- C35. G. Hecht*, E. M. Botta. *Advancements in Particle Swarm Optimization-Based Co-State Initialization for Spiral Trajectory Optimization in Cislunar Mission Design*, 2024 AAS/AIAA Astrodynamics Specialist Conference. To be presented.
- C34. F. Liu, A. Boonrath*, P. KrishnaKumar, E. M. Botta, S. Chowdhury. *Co-Design of Tether-Net System and its Trajectory for Space Debris Capture with Efficient Generalization using Reinforcement Learning*, 2024 AIAA AVIATION Forum. To be presented.
- C33. A. Boonrath*, T. Singh, **E. M. Botta**. *Identification of Parameters for Tethered Satellite System to Emulate Net-Captured Debris Towing*, 7th International Conference on Tethers in Space (TiS 2024), Toronto, Canada, June 2024.
(Recommended for submission to Acta Astronautica)
- C32. A. Boonrath*, F. Liu, **E. M. Botta**, S. Chowdhury. *Learning-aided Control of Robotic Tether-Net with Maneuverable Nodes to Capture Large Space Debris*, 2024 IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan, May 2024.
- C31. L. Field*, D. Bourabah*, **E. M. Botta**. *Online Control and Moment of Inertia Estimation of Tethered Debris*. 2024 AIAA SciTech Forum, Orlando, FL, January 2024.
(Best Space Tethers Student Paper Award)
(Recommended for submission to an AIAA journal)
- C30. A. Boonrath*, **E. M. Botta**. *Mid-Deployment Model Switching of Tether-Net Systems for Active Debris Removal*. 2024 AIAA SciTech Forum, Orlando, FL, January 2024.
- C29. L. Field*, G. Hecht*, **E. M. Botta**. *Successive Convexification for Tethered Debris Deorbiting*. 2024 AIAA SciTech Forum, Orlando, FL, January 2024.
- C28. L. Field*, D. Bourabah*, **E. M. Botta**. *Online Estimation and Control for Safe Post-Capture Dynamics of Tethered Debris*. Second International Orbital Debris Conference (IOC II), Sugar Land, TX, December 2023.
- C27. F. Liu, A. Boonrath*, P. KrishnaKumar, S. Chowdhury, **E. M. Botta**. *Learning Constrained Corner Node Trajectories of an Autonomous Tether-Net System for Space Debris Capture*. Second International Orbital Debris Conference (IOC II), Sugar Land, TX, December 2023.

- 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. KrishnaKumar, **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. DOI: [10.2514/6.2023-3920](https://doi.org/10.2514/6.2023-3920)
- 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.
(2nd place, best undergraduate student paper award competition)
- 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. DOI: [10.2514/6.2022-2379](https://doi.org/10.2514/6.2022-2379)
- 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. DOI: [10.2514/6.2022-1628](https://doi.org/10.2514/6.2022-1628)
- 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. DOI: [10.2514/6.2022-0273](https://doi.org/10.2514/6.2022-0273)
- 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. DOI: [10.2514/6.2022-1001](https://doi.org/10.2514/6.2022-1001)
- 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

- T11. *How to Catch Large Debris on Orbit: A Self-maneuvering Robotic Tether-net System*. 2024 NSF FRR-NRI PI Meeting, Baltimore, April 30, 2024.
- T10. *Towards autonomous tether-based active debris removal: modeling, simulation, estimation, and control*. University of Arizona, Tucson, April 18, 2024.
- 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: \$981,129 Own Share: \$ 604,417

Collaborative Research: A holistic human-in-the-loop framework for optimizing a personalized prosthetic arm

UB PI: Eleonora M. Botta (Former PIs: Minghui Zheng, Jiyeon Kang)

NSF, 09/01/22 – 09/01/25, \$ 249,852 (PI transferred)

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 – 08/31/24, \$503,573 (50% share).

REU Supplement: \$8,000 (100% share).

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

PI: Eleonora M. Botta, NSF, 09/01/21 – 08/31/25, \$175,000 (100% share).

SPACE Supplement: \$34,954 (100% share).

Collision Detection within a Python Simulator of Space Debris Capture with Nets

PI: Eleonora M. Botta, UB Research and Creative Activities for Undergraduates, 05/01/24 – 08/31/24, \$9,750 (100% share).

Digital Media & Online Features

1. [Eleonora Botta named Young Professional of the Year](#) (May 2024)
2. [Eleonora Botta receives distinguished teaching and mentoring award](#) (February 2024)
3. [PhD student wins best paper award at astrodynamics conference](#) (November 2023)
4. [Botta is interviewed for podcast ‘Rumors d’ambiente’](#) (August 2022)
5. [Botta’s PhD student wins best paper award at international space conference](#) (May 2022)
6. [Botta is a panelist in the Webinar Series: Helping STEM Students Thrive](#) (Nov. 2021)
7. [Engineer studies net-shooting robots that corral space debris](#) (Aug. 2021)
8. [How Do We Minimize The Threat Of Space Collisions? This Engineer Might Have The Answer](#) (Aug. 2021)
9. [Botta awarded NSF grant to model how tether systems could remove debris from low Earth orbit](#) (Aug. 2021)
10. [Botta presents at the UB Alumni Academy: Spring Semester 2021](#) (March 2021).
11. [Botta’s student wins first place at the 2020 WE Local Des Moines Collegiate Competition](#) (Aug. 2020)
12. [Botta’s undergraduate student recognized for outstanding scholarship](#) (Aug. 2020)
13. [Botta’s undergraduate student wins best paper award at international conference](#) (Feb. 2020)
14. [GAMES 2016 Oral Session 1st Place Prize Recipient, Eleonora Botta](#) (June 2016)
15. [Meet the 2015 Amelia Earhart Fellows](#) (June 2015)

Honors and Awards

2024	NFS Young Professional of the Year. <i>American Institute of Aeronautics and Astronautics (AIAA) Niagara Frontier Section (NFS).</i>
2023-24	President Emeritus and Mrs. Meyerson Award for Distinguished Undergraduate Teaching and Mentoring. <i>University at Buffalo, NY.</i>
2023	John V. Breakwell Award (best student paper award) (co-author). <i>American Astronautical Society (AAS) Space Flight Mechanics Committee.</i>
2022	SEAS Early Career Teacher of the Year Award. <i>School of Engineering and Applied Sciences, University at Buffalo, NY.</i>
2022	Best student paper award (co-author), 3rd IAA Conference on Space Situational Awareness (ICSSA), <i>International Astronautical Federation.</i>
2020	Best student paper award (co-author), 2nd IAA Conference on Space Situational Awareness (ICSSA), <i>International Astronautical Federation.</i>
2018	Outstanding Teaching Assistant Award. <i>Faculty of Engineering, McGill University, Canada.</i>

- 2017 **Second place, oral presentation competition.** *Department of Mech. Eng., McGill University, Canada.*
2nd McGill Mechanical Engineering Graduate Research Day.
- 2016 **First place, oral presentation competition.** *Department of Mech. Eng., McGill University, Canada.*
1st McGill Mechanical Engineering Graduate Research Day.
- 2015 **Amelia Earhart Fellowship.** *Zonta International.*
- 2013 - 2016 **McGill Engineering Doctoral Award (MEDA).** *Faculty of Engineering, McGill University, Canada.*
- 2013 – 2016 **Werner Graupe International Fellowship in Engineering.** *Antje Graupe Pryor Foundation, Canada.*
- 2010, 2013 **Giovanni Zampese Award.** *Banca di Credito Cooperativo Cantù, Italy.*
- 2013 **Scholarship for thesis carried out abroad.** *Politecnico di Milano, Italy.*
- 2011 - 2012 **ERASMUS scholarship.** *European Union / Italy Ministry of Education.*
- 2007 - 2012 **Tuition fees waiver.** *Politecnico di Milano / Alta Scuola Politecnica, Italy.*

Teaching Experience

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

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

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.

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	
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	
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	
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).

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	
Spring 2020	Overall Course:	3.9/5	

- Graduate Seminar (MAE 503).

Fall 2022	Instructor Evaluation:	4.5/5	
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	Overall Course:	4.3/5
Spring 2022	Instructor Evaluation:	4.5/5
	Overall Course:	4.3/5
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.
 - UB NASA Space Grant Award, 2023.
 - International Space Education Board NASA funding to attend International Astronautical Congress, 2024.
- Achira Boonrath, Ph.D., August 2022-present, degree expected May 2027.
 - Presidential Fellow, 2022-2025
 - 3rd place, 2023 UB MAE Graduate Student Poster Competition.
 - Jet Propulsion Laboratory (JPL) Visiting Student Research Program (JVS RP)
- Derek Bourabah, Ph.D., August 2021-present, degree expected August 2024.
 - Best paper, Space Tethers Student Paper Competition, SciTech 2024.
 - ICSSA Best Student Paper 1st Place Award, 2022.
 - UB NASA Space Grant Award, 2022.
 - UB NASA Space Grant Award, 2023.
- Grant Hecht, Ph.D., August 2020-present, degree expected May 2025.
 - National Science Foundation (NSF) Graduate Research Fellow, 2023-2025
 - SUNY GREAT (Graduate Research Empowering and Accelerating Talent) award.
 - NASA Pathways Intern, 2021-2022.
 - UB NASA Space Grant Award, 2022.
 - UB NASA Space Grant Award, 2023.
 - 2nd place, 2023 UB MAE Graduate Student Poster Competition.

- 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.
- Niranjana Ravichandra, Spring 2019.
- Derek Bourabah, Spring 2019.

PhD Theses external reviewer

- Paolo Fisticaro, Università di Pisa, Ph.D. degree expected 2024.

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

December 2023	CITI Good Clinical Practice Course, Biomedical Research Investigators, Biomedical Responsible Conduct of Research Course, Conflicts of Interest. Collaborative Institutional Training Initiative (CITI Program).
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
Member (2019 – 2023)
Senior Member (2023 – Present)
Member of Space Tethers Technical Committee (2019-Present), Vice-chair (2022-2024), Chair (2024-Present).
- American Astronautical Society, AAS (2016 – Present).
Member of the Space Flight Mechanics Committee (2022-Present).
- International Astronautical Federation, IAF (2023 – Present).
Member of the Working Groups on Space Traffic Management Technical Committee (2023 – Present).
- Research Associate at the Buffalo Museum of Science (2022 – Present).
- Institute of Electrical and Electronics Engineers (IEEE) (2022 – Present).
Member of the IEEE Robotics and Automation Technical Committee on Space Robotics (2023-Present).

- **School & Departmental Service, UB**

- Member of MAE Graduate Student Committee (2024-Present).
- MAE Faculty hiring committee member (2023-Present).
- 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, 2024.

- **Editor for Scientific Journals**

- Associate Editor, AIAA Journal of Spacecraft and Rockets (2024-Present).
- Associate Editor, Advances in Space Research (2024-Present).
- 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.
 - The Journal of the Astronautical Sciences
 - IEEE Transactions on Aerospace and Electronic Systems.
 - Nature Communications in Engineering.
 - 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
 - 2024 American Control Conference (ACC 2024)
- **Conference Organization**
 - **Technical Discipline Chair**
 - “Space Tethers”, SciTech 2024, Orlando, FL
 - “Space Tethers”, SciTech 2025, Orlando, FL
 - **Member in Conference Organizing Technical Committee**
 - 7th International Conference on Tethers in Space, Toronto, Canada, June 2024.
 - **Session Chair**
 - Track “Tethers in Space I”, SciTech 2024. Orlando, FL. January 8, 2024.
 - 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, 2024).
- **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

Mothertongue.