Rick Schieni, Ph.D.

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EDUCATION

Doctor of Philosophy — ***Rutgers University – New Brunswick, NJ*** — ***January 2023***

Program: Mechanical and Aerospace Engineering
Dissertation: Reference Governors for Systems with Polynomial Constraints: Theory and Extensions
Advisor: Dr. Laurent Burlion

Master of Science — ***Rutgers University – New Brunswick, NJ*** — ***November 2017***

Program: Mechanical and Aerospace Engineering
Thesis: Landing of a Quadrotor UAV Swarm in a Nonstationary Confined Compartment
Advisor: Dr. Shahab Shojaei-Zadeh

Bachelor of Science — ***Rutgers University – New Brunswick, NJ*** — ***May 2015***

Major: Mechanical Engineering
Minor: Economics

TEACHING EXPERIENCE

Texas State University — **San Marcos, TX**

Assistant Professor of Instruction — ***September 2025 – Present***
Lecturer — ***January 2025 – May 2025***

- Taught four sections of Introduction to Digital Mechanical Engineering Lab to groups of 20 students.
- Designed laboratory exercises and collaborated on lab manual writing for the Smart Instrumentation and Measurement course.
- Worked to define performance indicators which support student outcomes and identify course assessments which accurately reflect student performance in preparation for initial ABET accreditation.

Middlesex College — **Edison, NJ**

Assistant Professor — ***January 2018 – December 2024***

- Prepared lectures, class activities, and laboratory experiments for ten separate engineering courses offered either in-person or online.
- Taught a minimum of three, and as many as six, courses per semester with additional courses taught during summer sessions.
- Regularly collected and analyzed assessment data to determine student performance and adjust course presentation correspondingly.
- Used instructional technology, such as Canvas, to make course resources available to students online.
- Implemented new pedagogical techniques, such as the flipped classroom method, to enhance student learning.
- Served as the official advisor to all students enrolled in the Mechanical Engineering Technology program.
- Incorporated the use of hands-on demonstrations and exercises as much as possible to bridge the gap between theoretical course material and its real-world implications.

Middlesex College — **Edison, NJ**

Mechanical Engineering Technology Curriculum Coordinator — ***January 2018 – December 2024***

- Organized assessment data at the student, course, and program outcome level for evaluation by program accreditors (ABET).
- Served as the ambassador for the Mechanical Engineering Technology program to members of the ABET Accreditation Team during the 2021 ABET Accreditation Site Visit.
- Analyzed course, student, and program outcome performance and developed action plans for continuous improvement.
- Hosted annual meetings with the program's Industrial Advisory Board to ensure program graduates had the skills required by industry.
- Updated the Mechanical Engineering Technology curriculum in response to the needs of the college and industry.
- Worked with mechanical and electrical engineering lab coordinators to acquire and maintain laboratory equipment.

Rutgers University **New Brunswick, NJ**

Teaching Assistant ***Spring 2016 & Spring 2017***

Internal Combustion Engines Course – Spring 2017

- Proctored exams and graded assessments for a class of 50 students.

Engineering Mechanics: Statics Course – Spring 2016

- Facilitated three recitation sections of approximately 40 students focused on problem solving exercises.
- Graded midterms and finals for over 150 students in a timely manner.

COURSES TAUGHT EFFECTIVELY

1. **Advanced Mechanical Drawing** - *Use AutoCAD and SOLIDWORKS to create mechanical engineering specific technical drawings.*
2. **Engineering Mechanics: Dynamics** - *Apply different techniques to describe the relationship between forces and the motion of rigid bodies.*
3. **Engineering Mechanics: Statics** - *Utilize Newton's Second Law to develop a connection between static rigid bodies and the forces applied to them.*
4. **Graphic Science** - *Employ AutoCAD and hand-drawing methods to understand the fundamentals of technical drawings.*
5. **Manufacturing Processes and Materials** - *Learn material properties and manufacturing processes to design mechanical systems with current manufacturing techniques in mind.*
6. **Introduction to Solving Engineering Problems Using Computers** - *Utilize Matlab and Simulink to learn computer programming structures and how they are used to solve engineering problems.*
7. **Mechanical Design Project** - *Use the material taught in the prerequisite classes to design and manufacture a capstone mechanical design project controlled using Programmable Logic Controllers.*
8. **Rigid Body Kinematics** - *Design and analysis of mechanisms consisting of rigid body components.*
9. **Solid Modeling** - *Employ SOLIDWORKS to create three-dimensional models of parts and assemblies for use in the creation of technical graphics as well as other computer-aided engineering tasks.*
10. **Statics for Technicians** - *Learn to design and analyze load-bearing structures in two dimensions.*
11. **Introduction to Digital Mechanical Engineering Lab** – *Provide first-year mechanical engineering students with hands-on exposure to the different aspects of the discipline.*
12. **Control Systems** – *Gain an understanding of the introductory concepts of linear control systems.*
13. **Smart Instrumentation and Measurement** - *Learn and employ the basic concepts and principles of instrumentation and measurement systems.*

RESEARCH INTERESTS

- Nonlinear Control - Nonlinear Dynamics - Constrained Control - Reference Governors - Aerospace Systems
- Robust Control - Morphing Structures - Distributed Control - Bio-Inspired Mechanisms - Nonlinear MPC
- Dynamical Systems - Applications of Control Theory to Problems in Neuroscience - Unmanned Aerial Vehicles

PUBLICATIONS

R. Schieni, M. Malisoff, and L. Burlion, "Interval Contractor-based Reference Governors for a Class of Uncertain Nonlinear Systems," Automatica, vol. 179C (112407), 2025.

Schieni, R., Modasiya, A., Malisoff, M., and Burlion L., (2024). Quadrotor Flight Envelope Protection with Trajectory and Yaw Tracking, *AIAA Journal of Guidance, Control, and Dynamics*, vol. 47(12), pp. 2601-2614, 2024.

Schieni, R., Zhao, C., Malisoff, M. and Burlion, L., (2023) Reference Governor Design in the Presence of Uncertain Polynomial Constraints, In *2023 American Control Conference (ACC)*, San Diego, CA, USA, 2023, pp. 1428-1433.

Schieni, R., Zhao, C., Barreira, J., Malisoff, M., & Burlion, L. (2023). Quadrotor Flight Envelope Protection while Following High-Speed Trajectories: a Reference Governor Approach. In *AIAA SCITECH 2023 Forum* (p. 1442).

Burlion, L., Schieni, R., & Kolmanovsky, I. V. (2022). A reference governor for linear systems with polynomial constraints. *Automatica*, *142*, 110313.

Schieni, R., Simsek, M., Cunis, T., Bilgen, O., & Burlion, L. (2022). Control of bistable structures using a modified hybrid position feedback controller. In *AIAA SCITECH 2022 Forum* (p. 0922).

Schieni, R., & Burlion, L. (2022). A Reference Governor for Control of Bistable Structures with Polynomial Constraints. In *2022 IEEE Conference on Control Technology and Applications (CCTA)* (pp. 285-290). IEEE.

Simsek, M., Schieni, R., Burlion, L., & Bilgen, O. (2022). A Hybrid Position Feedback Controlled Bistable Metamaterial Concept. In *10th European Nonlinear Dynamics Conference (ENOC 2022)*.

RESEARCH EXPERIENCE

Graduate Researcher – The Burlion Research Group ***September 2019 – January 2023***
Rutgers University New Brunswick, NJ

- Applied control methods such as PID, optimal control, model predictive control, reference governors and dynamic controllers to nonlinear systems such as morphing structures, unmanned aerial vehicles, and satellites.
- Designed and implemented a reference governor approach to control systems subject to polynomial constraints. Extensions were made to systems subject to disturbances, uncertain model parameters, and piecewise polynomial constraints.
- Used MATLAB and Python to model physical systems, simulate system responses, and optimize design parameters.

Graduate Researcher - Complex Fluids and Soft Matter Laboratory ***September 2015 - November 2017***
Rutgers University New Brunswick, NJ

- Employed MATLAB to program and solve an optimization problem that would navigate large groups of quadrotor unmanned aerial vehicles as they attempted to land in a confined compartment on a moving vessel.
- Designed a set of constraints that would ensure individual unmanned aerial vehicles did not collide with one another or with the walls of the landing compartment as they attempted to land.

Undergraduate Research Assistant - The Mazzeo Research Group ***January 2014 - December 2014***
Rutgers University New Brunswick, NJ

- Performed Fourier analysis on sound waves created by the "voice" of a soft robot modeled after a human larynx.

PROFESSIONAL ACTIVITIES

- Campus Diversity Task Force Member - Middlesex College *Fall 2024*
- Amplify Institute Fellow – Development for Instructional Engineering Faculty at HSIs *Fall 2024*
- Reviewer – 2025 ASEE Annual Conference & Exposition (Ethics Division) *Fall 2024*
- Founding Faculty Advisor: Middlesex Makers Engineering Club – Middlesex College *Fall 2023 – Fall 2024*
- Volunteer – New Jersey Science Olympiad State Finals *Spring 2018 – Spring 2023*
- Scholarship Reviewer – Middlesex College *June 2018 -Fall 2024*
- Academic Standards Task Force Member - Middlesex College *Spring 2020 – Fall 2023*
- Reviewer - 2022 6th IEEE Conference on Control Technology and Applications *March 2022*
- Educational Resources Task Force Member - Middlesex College *Spring 2019 – Spring 2021*
- Division Council By-Laws Committee Member - Middlesex College *Fall 2020*
- Division Council Faculty Representative - Middlesex College *Fall 2018 – Fall 2020*
- Faculty Search Committees - Middlesex College:
  - Chairperson: Mechanical Engineering Technology Instructor *Spring 2024*
  - Electrical Engineering Instructor *Fall 2021, 2022 and Spring 2022, 2024*
  - Mechanical Engineering Instructor *Fall 2022 and 2024*
  - Chemistry Instructor *Fall 2019*

INDUSTRY EXPERIENCE

Integrated Automated Systems Engineering Co., Inc. (IASE Co., Inc.) **Branchburg, NJ**
Design Engineering Intern ***May 2015 - August 2015***

- Collaborated with senior engineers to design parts and assemblies for packaging robotic systems.
- Created engineering drawings with the tolerances necessary for manufacturing and assembly.
- Employed SOLIDWORKS to perform computer-aided engineering techniques such as finite element analysis to ensure the longevity of new product designs throughout the product's life cycle.

Savin Engineers, P.C. **Bridgewater, NJ**

Engineering Intern ***May 2014 - August 2014***

- Utilized Carrier's Hourly Analysis Program to perform heating and airflow calculations for construction projects.
- Ensured that all engineering designs met the required building and fire codes.
- Used AutoCAD to create new and modify existing engineering drawings to reflect changes in system designs.

AWARDS AND HONORS

Rutgers School of Engineering Fellow

NASA New Jersey Space Grant Consortium Fellow

Senior Design Project Award Winner: Excellence in Ingenuity

Summa Cum Laude Graduation Honors

Tau Beta Pi Engineering Honors Society

Pi Tau Sigma Mechanical Engineering Honors Society