

# Seiji Shaw

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## Education

**2018-** ScB Honors in Computer Science and Mathematics - Brown University, Providence, RI  
Advisor: George Konidakis  
*Activities: Brown-RISD Hillel Orthodox Student Liaison, Brown Design Workshop Monitor*

**2017-2018** Gap Year Program - Technion Israel Institute of Technology, Haifa, Israel  
*Coursework: Real Analysis, Linear Algebra*

## Employment

<b>Intelligent Robot Lab, Brown University</b>	Providence, RI
<i>Researcher</i>	<i>Mar 2020-Present</i>

- Applying Riemannian geometry and nonlinear control theory to investigate robot arm motion generation algorithms to add robust safety guarantees for learning-based control approaches for contact-rich manipulation tasks.
- Research advised by Prof. George Konidakis.

<b>Mitsubishi Electric Research Laboratories</b>	Cambridge, MA
<i>Research Intern</i>	<i>May-Aug 2021</i>

- Developed data-collection and optimization procedures for system identification of dynamic contact models for fast high-fidelity simulation for model-free reinforcement learning and model-predictive control.
- Formulated novel dynamic movement primitive with provable safety guarantees from nonlinear control theory. Currently developed under a research license issued by MERL.

<b>Hong Lab, Cedars-Sinai Medical Center</b>	Los Angeles, CA
<i>Research Assistant</i>	<i>May-Aug 2019</i>

- Developed image-processing algorithms to analyze cardiomyocyte membrane-protein response under drugs such as isoproterenol (2019).

<b>Hong Lab, Cedars-Sinai Medical Center</b>	Los Angeles, CA
<i>Research Assistant</i>	<i>Jun-Aug 2015</i>

- Designed and implemented workflow to generate meshes from 3D point clouds of proteins taken using stochastic optical reconstruction microscopy (STORM).

## Mentorship and Teaching

### Head Teaching Assistant, CSCI 1951R: Introduction to Robotics

Department of Computer Science, Brown University

Providence, RI

Aug-Dec 2020

- Managed a staff of four to facilitate Prof. Stefanie Tellex's upper-level Introduction to Robotics class.
- Held weekly hours, maintained a course website, wrote and graded homework assignments, and facilitated a three-week quadrotor building process. Class size: 16 undergraduates, 4 masters, and 3 PhD students.
- Generated 'offline' course materials for remote students working without reliable internet connection. Shipped remote students spare parts so that the course was not limited by local part accessibility.
- Topics include: PID Control, Unscented Kalman Filters, Simultaneous Localization and Mapping, Forward and Inverse Kinematics, Motion Planning.

### Mentor

Team 5987 Galaxia, Reali Hebrew Day School

Haifa, Israel

Oct 2017-April 2018

- Held workshops to teach programming team basic control theory and image processing.
- Copy-edited English in student award submissions translated from Hebrew.

## Honors and Awards

- COMAP Mathematical Contest in Modelling Outstanding Winner (18 of 7023 Submissions) 2020
- COMAP Mathematical Contest in Modelling Rachel Carson Award (1 of 18 Winners) 2020
- Karen T. Romer Undergraduate Research and Teaching Award 2019
- Blacher Outstanding New Student Initiatives Award, Brown-RISD Hillel 2019

## Publications

1. S. Shaw\*, B. Abbatematteo, and G. Konidakis, "Riemannian motion policies for safe impedance control in contact-rich manipulation," *arXiv preprint arXiv:2109.12103*, 2021
2. T. Ding\*, S. Kumar\*, and S. Shaw\*, "A seabird population model to evaluate plastic pollution policies." *UMAP Journal*, vol. 41, no. 3, 2020
3. Y. Liu, K. Zhou, J. Li, S. Agvanian, A.-M. Caldaruse, S. Shaw, T. C. Hitzeman, R. M. Shaw, and T. Hong, "In mice subjected to chronic stress, exogenous cbin1 preserves calcium-handling machinery and cardiac function," *Basic to Translational Science*, vol. 5, no. 6, pp. 561–578, 2020
4. Y. Fu, S. A. Shaw, R. Naami, C. L. Vuong, W. A. Basheer, X. Guo, and T. Hong, "Isoproterenol promotes rapid ryanodine receptor movement to bridging integrator 1 (bin1)-organized dyads," *Circulation*, vol. 133, no. 4, pp. 388–397, 2016