# Saboia da Silva, **Maira**

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## Work Experience

**NASA Jet Propulsion Laboratory** — *Pasadena, CA, USA*

Postdoctoral Scholar | Supervisor: Dr. Michael Wolf — *Sep. 2019 - current*

Development of technology for multi-agent systems (Tools: ROS, Python, PostgreSQL, PostGIS).

**The State University of New York at Buffalo** — *Buffalo, NY, USA*

Lecturer: Introduction to Computer Programming; Greats Ideas In Computer Science. — *May. 2018 - May. 2019*

**Padtec** — *Campinas, SP, BR*

Junior Systems Analyst — *Nov. 2011 - Jun. 2014*

Development of embedded system for optical network devices and systems based on UNIX (Tools: C, Python).

**Foundation for Technological Innovation** — *Recife, PE, BR*

Systems Analyst Intern — *Feb. 2008 - Jan. 2009*

Development and testing of web applications designed for Personal Digital Assistants (PDA) (Tools: C#, ASP.NET, ADO.NET).

## Education

**The State University of New York at Buffalo (UB)** — *Buffalo, NY, United States*

Ph.D in Computer Science and Engineering — *Aug. 2014 - Jul. 2019*

Supervisor: Dr. Nils Napp

**State University of Campinas (UNICAMP)** — *Campinas, SP, Brazil*

M.S. in Computer Science — *Aug. 2009 - Jul. 2011*

Supervisor: Dr. Alexandre Xavier Falcão

**State University of Pernambuco (UPE)** — *Recife, PE, Brazil*

B.S. in Computer Engineering — *Aug. 2004 - Jul. 2009*

Supervisor: Dr. Carlos Alexandre Barros de Mello

## Publications

- The Pluggable Distributed Resource Allocator (PDRA):a Middleware for Distributed Computing in Mobile Robotic Networks, Rossi*, F., Vaquero*, T., Net, M., **Saboia, M.**, and Hook, J.. International Conference on Intelligent Robots and Systems, (IROS 2020) (Under review).
- Thangavelu, V., **Saboia, M.**,Choi, J. and Napp, N., Autonomous Modification of Unstructured Environments With Irregular Found Material. In 2020 IEEE International Conference on Robotics and Automation (ICRA 2020).
- **Saboia, M.**, Thangavelu, V. and Napp, N., multi-material construction with a heterogeneous robot team. Robotics and Autonomous Systems, 121, p.103239.
- Liu, Y., **Saboia, M.**, Thangavelu, V. and Napp, N., Approximate Stability Analysis for Drystacked Structures. In 2019 IEEE International Conference on Robotics and Automation (ICRA 2019)
- **Saboia, M.**, Thangavelu, V. and Napp, N., Autonomous Multi-Material Construction with a Heterogeneous Robot Team. Int. Symp. on Distributed Autonomous Robotic Systems (DARS 2018)
- **Saboia, M.**, Thangavelu, V., Gosrich, W. and Napp, N., 2018. Autonomous adaptive modification of unstructured environments. Robotics: Science and Systems (RSS 2018)
- Thangavelu, V., Liu, Y., **Saboia, M.** and Napp, N., 2018, May. Dry Stacking for Automated Construction with Irregular Objects. In 2018 IEEE International Conference on Robotics and Automation (pp. 1-9) (ICRA 2018)
- Liu, Y., **Saboia, M.**, Schatz, K., Paul, M.J. and Napp, N., 2016. Biometric patterns in long-evans rats for automatic behavior analysis. Visual Observation and Analysis of Vertebrate and Insect Behavior, 2016, ICPR – Int. Conference on Pattern Recognition,pp.25-28 (ICPR 2016)
- Neves, R., Mello, C.A.B., **Saboia, M.** and Bezerra, B., 2009. Thresholding the courtesy amount of brazilian bank checks based on tsallis entropy. IEEE Latin America Transactions,7(6)
- Neves, R.F., Mello, C.A.B., **Saboia, M.** and Bezerra, B.L., 2008, October. A new algorithm to threshold the courtesy amount of Brazilian bank checks. In Systems, Man and Cybernetics, 2008 (pp. 1226-1230) (IEEE SMC 2008)
- Neves, R.F.P., Mello, C.A.B., **Saboia, M.** and Bezerra, B.L.D., 2008, June. A new technique to threshold the courtesy amount of Brazilian bank checks. In Systems, Signals and Image Processing, 2008. IWSSIP 2008. 15th International Conference on (pp. 93-96) (IWSSIP 2008)

## Research Projects

**A-PUFFER: Autonomous Pop-Up Flat-Folding Explorer Robots** — *NASA JPL, USA* — *2019-Present*

Development of a hybrid distributed mapping framework for the autonomous Lunar rover network.

Keywords: Distributed mapping, System Design, Autonomy, Database.

**MOSAIC: Mars On-site Shared Analytics Information and Computing** — *NASA JPL, USA* — *2019-Present*

Scheduling and task-allocation algorithms to share computational tasks among heterogeneous agents over time-varying communication links.

Keywords: Scheduling and Task-Allocation, Autonomy, Algorithm, Simulation

**Adaptive Multi-Robot Autonomous Modification of Unstructured Environments** — *UB, USA* — *2016-Present*

Methods to perform autonomous construction in irregular terrain and design of a heterogeneous robotic system that allows effective evaluation of these methods at a physical system. The robotic team is able to manipulate material of different physical properties (rigid and amorphous materials)

Keywords: Robot design, System Design, Autonomy, Path Planning, Simulation, Robotic Vision, Bio-Inspired Robotics

**Strategies for Dry-Stacking Structures with Irregular Objects** — *UB, USA* — *2016-2019*

Assembly planning method to dry stack irregular rigid objects in a 2D simulation environment

Keywords: Autonomous Construction, Irregular Objects, Simulation, Geometrical Analysis, Physical Analysis

**Deep Learning Based Automated Re-Identification Techniques of Biometric Color Patterns in Long-Evans Rats** — *UB, USA* — *2015-2016*

Re-identification approach for behaviour analysis of Long-Evans lab rats that combines a deep learning classifier with image similarity techniques

Keywords: Deep Learning, Siamese Networks, Similarity Measurement, Long-term Tracking, Data Analysis, Animal Biometrics

**Clustering of pixels by image foresting transform and its application in background segmentation of natural images** — *UNICAMP, BR* — *2009-2011*

A new methodology for automatic extraction of desired objects in natural images. A fuzzy model based on the Image Foresting Transform method is used to classify the pixels as object or background.

Keywords: Graphs, Clustering, Image Processing, Object Segmentation, Classification algorithms, Language C

**Thresholding Algorithms for Bank Checks** — *UPE, BR* — *2007-2009*

Use of histogram specification and Tsallis entropy to find the best threshold value in the thresholding phase of the check courtesy amount

Image Processing, Image color analysis, Object Segmentation, Object Classification, Matlab

## Scholarships & Awards

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| 2018 | **Finalist**, Best Systems Paper Award at the Robotics Conference: Science and Systems (RSS) | *USA* |
| 2014-2018 | **PhD. Scholarship**, Science without Borders - SwB/Laspau | *USA* |
| 2009-2011 | **M.S Scholarship**, São Paulo Research Foundation – FAPESP | *Brazil* |
| 2006-2009 | **B.S Scholarship**, National Council for Scientific and Technological Development – CNPQ | *Brazil* |

## Presentations

**Autonomous Multi-Material Construction with a Heterogeneous Robot Team** — *CU Boulder, USA* — *2018*

Int. Symp. on Distributed Autonomous Robotic Systems (DARS)

**Bio-Inspired Multi-Material Construction** — *The Rockefeller University, USA* — *2018*

Social Evolution and Behavior course

**Autonomous adaptive modification of unstructured environments** — *CMU, USA* — *2018*

Women in Robotics IV Workshop at Robotics: Science and Systems (RSS)

**Dry Stacking Strategies for Autonomous Construction** — *MIT, USA* — *2017*

The What without the How: Specifying Planning Problems in Robotics Workshop at Robotics: Science and Systems (RSS)

**Robotic System For Autonomous Construction Using Irregular found Objects** — *Northeastern University, USA* — *2017*

Poster at New England Manipulation Symposium (NEMS)