# Bernardo Aceituno-Cabezas

## Personal Data

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| **Address:** | Universidad Simón Boívar, ELE, Office 302, Caracas, Venezuela |
| **Phone:** | +58 416 4146371 |
| **emails:** | b.a.ve@ieee.org 12-10764@usb.ve |
| **webpage:** | Homepage Github LinkedIn |

## Education

**Universidad Simón Bolívar** — Caracas, VE
Electronics Engineering — September 2012 - March 2018 (expected)
Concentration: Robot Locomotion    Advisor: Gerardo Fernández    Overall GPA: 4.86/5.00

## Experience

**Visiting Researcher** — Genoa, IT
Dynamic Legged Systems Laboratory, IIT — July 2017 - August 2017

- Developed a simultaneous contact and motion planning algorithm for non-gaited multi-legged robot locomotion in challenging terrain, using mixed-integer optimization.
- Carried experiments in a hydraulic quadruped robot HyQ, optimizing robust gaits over a variety of challenging terrain tracks.

**Undergraduate Researcher** — Caracas, VE
Mechatronics R&D Group, C Laboratory, USB — September 2016 - February 2017

- Developed a non-gaited locomotion framework, using mixed-integer optimization for contact and gait planning with terrain heuristics.
- Extended a robust walking motion planning algorithm based on contact wrench cone and convex optimization to multilegged locomotion.

**Summer Research Intern** — Caracas, VE
Mechatronics R&D Group, C Laboratory, USB — June 2016 - September 2016

- Developed a generalized footstep planning algorithm for multilegged robots with arbitrary geometries and number of legs, based on Mixed Integer Convex Optimization.

**Research Assistant** — Caracas, VE
Mechatronics R&D Group, C Laboratory, USB — September 2015 - March 2016

- Developed an Underwater Robotics Perception Toolbox for large scale underwater 3D reconstructions and structural complexity analysis.
- Integrated a gait optimization method for a hexapod robot using a centroidal dynamics and full kinematics model.

## Professional Service

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| **Reviewer** of IEEE ICRA | 2018 - Present |
| **Reviewer** of IEEE RA-L | 2018 - Present |
| **Reviewer** of IEEE IROS | 2017 - Present |
| **Reviewer** of IEEE CASE | 2017 - Present |
| **Secretary General** of the USB EECS Student Council | 2015-2016 |

## Teaching Experience

**Teaching Assistant for "Robotics" (EC3804)** — Caracas, VE
Instructor: Juan C. Grieco — January 2017 - March 2017

**Teaching Assistant "Digital Circuits" (EC1723)** — Caracas, VE
Instructor: Marta Perez — April - June 2016

## Awards and Honors

**Best Student Award**                                                    Caracas, VE
December 2017
Given for an outstanding academic and extracurricular undergraduate career, issued by Universidad Simón Bolívar.

**Outstanding Thesis Award**                                              Caracas, VE
October 2017
Given for an outstanding bachelor's thesis with significant contributions to its field, resulting on peer-reviewed publications.

**IROS Travel Award**                                                     Vancouver, BC
August 2017
To attend IROS 2017 in Vancouver (Canada), issued by the IEEE Robotics and Automation Society.

**President's List**                                                      Caracas, VE
June 2017
Recognized as part of the top 1% students of the entire junior class of 2016/2017.

**USB Excellence Award**                                                  Caracas, VE
September 2014
Given for an outstanding academic and extracurricular performance, issued by Universidad Simón Bolívar. *(last time awarded)*

## Groups and Societies

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| **Institute of Electrical and Electronic Engineers (IEEE)** | 2016 - Present |
| **IEEE Robots and Automation Society (IEEE-RAS)** | 2016 - Present |
| **IEEE-RAS TC in Model-based Optimization for Robotics** | 2017 - Present |
| **USB Electronics Engineering Student Council** | 2014 - 2016 |

## Publications

[1] **Bernardo Aceituno-C**, Carlos Mastalli, Hongkai Dai, Michele Focchi, Andreea Radulescu, Darwin G. Caldwell, Jose Cappelletto, Juan C. Grieco, Gerardo Fernández, and Claudio Semini. Simultaneous Contact and Motion Planning for Robust Multi-Legged Locomotion via Mixed-Integer Convex Optimization. *IEEE Robotics and Automation Letters (RA-L)*, to appear, 2018. [url] [video]

[2] **Bernardo Aceituno-C**, Hongkai Dai, Jose Cappelletto, Juan C. Grieco, and Gerardo Fernández. A Mixed-Integer Convex Optimization Framework for Robust Multilegged Robot Locomotion Planning over Challenging Terrain. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vancouver, BC, September 2017. [url]

## Workshop Papers and Abstracts

[1] **Bernardo Aceituno-C**, Hongkai Dai, Carlos Mastalli, Michele Focchi, Andreea Radulescu, Darwin G. Caldwell, Jose Cappelletto, Juan C. Grieco, Gerardo Fernández, and Claudio Semini. A Mixed-Integer Convex Formulation for Simultaneous Contact, Gait and Motion Optimization on Multi-Legged Robots, In *IROS 2017 Workshop on Frontiers in Contact-rich Robotic Interaction: Modeling, Optimization and Control Synthesis*, Vancouver, BC, September, 2017. [url]

[2] **Bernardo Aceituno-C**, Hongkai Dai, and Gerardo Fernández. Mixed-Integer Convex Optimization of Non-Gaited Multi-Legged Walking Sequences, In *RSS 2017 Workshop on Challenges in Dynamic Legged Locomotion*, Cambridge, MA, July 2017. [url]

## Technical Reports

[1] **Bernardo Aceituno-C**, Jose Cappelletto, Juan C. Grieco, and Gerardo Fernández. A Generalized Mixed-Integer Convex Program for Multilegged Footstep Planning on Uneven Terrain. Technical Report. arXiv:1612.02109v2 [cs.RO]. [arXiv]

## Theses

[1] **Bernardo Aceituno-C**. A Mixed-Integer Convex Optimization Framework for Multi-legged Locomotion on Uneven Terrain. *Bachelor's Thesis*, Caracas, VE, September 2017.