Juan David Gamba Camacho

Personal Information

Nationality	Colombian/ Costa Rican
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Education

2018–2021 **Doctor of Philosophy - PhD in Advanced Robotics,** *Dipartimento di Informatica, Bioingegneria, Robotica e Ingegneria dei Sistemi,* Università degli Studi di Genova, Italy.

2016–2018 **Master's Degree, Electrical Engineering,** *Departamento de Engenharia Eletrica,* Pontificia Universidade Catolica do Rio de Janeiro, Brazil.

2012–2015 **Bachelor's Degree, Automation and Control,** *Escuela de Ingenieria Electronica,* Universidad Latina de Costa Rica, Costa Rica.

2010–2012 **Associate's Degree, Electronics and Communications Engineering,** *Escuela de Ingenieria Electronica,* Universidad Latina de Costa Rica, Costa Rica.

Achievements & Honors

11/2015 **Winner of The National Award of Electronic Engineering, Professional Category - ASOELECTRONICA ITCR,** *Nationwide SCADA, Energy Quality, Instituto Costarricense de Electricidad*, Costa Rica. **News story.**

Experience

2018–2021 **Researcher PhD Student,** *Istituto Italiano di Tecnologia,* Genova, Italy.

- Design of a balance controller for spring-loaded legged robots. The strategy enables the robot to accurately perform high-performance motions and acrobatics.
- Design of an optimization strategy using casADI with orthogonal collocation methods to efficiently solve nonlinear programming (NLP) problems. This method is capable of solving the NLP problem three times faster than multiple shooting methods.
- Design of a Non-linear observer to estimate the spring model of a spring-loaded legged robot. The strategy helps the robot to keep the balance and perform high-performance tasks using an unknown spring.
- Project website: **royfeatherstone.org/skippy/index.html**

2015–2016 **Project Engineer - Security Solutions,** *Emerson Process Management,* Costa Rica.

- Designing and implementing scripts for different application involving embedded devices; for the Security US Team and provide support for different Power Water Solutions area projects.

2014–2015 **Project Engineer,** *Emerson Process Management,* Costa Rica.

- Implementation, testing, and commissioning of different projects developed with Ovation (company software), also provide technical support and troubleshooting on-site activities. Responsibilities included: Field Service Support; Project Engineering.
  Projects:
- Enertek, Mexico: Design and implementation of the control logic for Air Condensers and a Vacuum System for the full functionality with the Steam Turbine. Debug and configure the Modbus communication between the Alstom and SCADA systems.
- Promissao and COG (Centro de Operação da Geração), Brazil: Field support for the maintenance of GU (Generation Unit) one and three. Configuration of WIN-911 (notifications, alarms, and events software). Configuration of EDS (platform for network-security).

2013–2014 **Intern Engineer,** *Instituto Costarricense de Electricidad,* Costa Rica.

- Design and implementation of a nationwide SCADA on energy quality. The system has around fifty thousand variables using LabVIEW and the Data Logging and Supervisory Control module. The application consists of logging information via Modbus and other communications protocols from several sites distributed along with the country and storing it to be accessed by everyone through a public server.
- The system was previously priced at approximately two hundred and fifty thousand dollars and it ended up being developed by two engineering students in seven months.

Scientific Publications

2021 **Balancing on a Springy Leg,** *IEEE International Conference on Robotics and Automation, June 2021*, Xi'an, China.

2021 **Robust Balancing Control of a Spring-legged Robot based on aHigh-order Sliding Mode Observer,** *IEEE-RAS International Conference on Humanoid Robots, July 2021*, Munich, Germany.

2018 **A Robust Visual Servoing Approach for Robotic Fruit Harvesting,** *Master Thesis, Departamento de Engenharia Elétrica, Pontifícia Universidade Católica do Rio de Janeiro, 2018*, Brazil.

2018 **A Robust Vision-based Control for Robotic Fruit Harvesting using Deep Learning,** *IEEE LARS 2018 - 15th Latin American Robotics Symposium*, Brazil.

2018 **A Visual Servoing Approach For Robotic Fruit Harvesting in the Presence of Parametric Uncertainties,** *CBA Proceedings Volumes, 2018. XXII Congresso Brasileiro de Automatica*, Brazil.

Skills & Background Knowledge

Computer skills

Basic	Java, HTML
Intermediate	VHDL,Assembler, C++, LabVIEW, Solid Works, Power Shell, VBA, V-REP, ROS, CasADi, LaTeX.
Advanced	Pyhton, Matlab, Linux, Windows, Microsoft Office.

Communication skills

Problem Solving.

Adaptability.

Good ability in sharing and/or presenting ideas.

Very good team-work skills.

Friendly, sociable.

Ability to bear under high pressure of tasks.

Research Interests

Control Theory: Linear and Non-linear Control, High Order Sliding Mode Observers and Dynamic Control.

Optimal Control: Linear, Quadratic and Non-linear Programming.

Machine Learning: Reinforcement Learning, Deep Learning and Deep Reinforcement Learning.

Block-chain & Cryptocurrencies.

Languages

Spanish	Mothertongue	
English	Advanced	*Fluent in communicative and academic aspect*
Portuguese	Intermediate	*Fluent in communicative*
Italian	Basic	*B1 Level*

Interests

- Music
- Documentaries
- Sports
- Social Activities