Camilo Andrés Cáceres Flórez, Ph. D

City: Bogotá, Colombia
Website: https://camilo-cf.github.io
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EDUCATION

University of Campinas (UNICAMP) August 2016- October 2020

Ph. D Mechanical Engineering
Advisor: João Mauricio Rosário.
Thesis: "Methodological Proposal for Optimization applied to Systems Engineering using concepts of Artificial Intelligence, Data Science, and Industry 4.0. Case studies: Emergency Service in an e-Hospital and Energy Management System using renewable sources".
Scholarship: Graduate scholarship– CNPq (National Council for Scientific and Technological Development)

University of Campinas (UNICAMP) July 2014- July 2016

M. Eng. Mechanical Engineering
Advisor: João Mauricio Rosário.
Thesis: "Assistive home automation based on the use of an EEG sensor: a case study."
Scholarship: Graduate scholarship – CAPES (Coordination for the Improvement of Higher Education Personnel)

Military University Nueva Granada (UMNG) January 2009- March 2014

B.Eng. Mechatronics

WORK HISTORY

WORK EXPERIENCE

Machine Learning Engineer, SPECTRA Ingeniería (Colombia) Oct 2020-present

- Development and implementation of Computer Vision systems using Deep Learning.
  - Intelligent Video surveillance project - phase 1.
  - Object recognition in complex environments – phase 1.
- Demo deployment in Cloud (AWS).
- Backend and Frontend implementations.
- Project Management and planning.

RESEARCH EXPERIENCE

Postdoctoral Researcher, University of Campinas (Brazil) Oct 2020-Present

Advisor: João Mauricio Rosário.

Research Topic: Deep Learning and Deep Reinforcement Learning applied to weather forecasting and renewable energy systems using time-series and simulation.

Graduate Student, University of Campinas (Brazil) July 2016-Sep 2020

Advisor: João Mauricio Rosário.

- Simulation using Discrete Event Simulation and Optimization using Evolutionary Computational methods and Industry 4.0 concepts of a Hospital Emergency Department.
- Time-series analysis and forecasting of stochastic systems (Hospital Emergency Department patients' flow and Weather – wind speed and global horizontal irradiance)
- Develop a smart agent using deep reinforcement learning.
- Develop a simulation tool for the energy distribution of hybrid microgrids.
- Develop a neuroevolutive algorithm to control a mobile robot.

Visiting Graduate Student, Centrale Supélec (France) Feb 2019- July 2019

Advisor: Didier Dumur/ João Mauricio Rosário.

- Initiate Collaboration with Dr. Didier Dumur of the Département Automatique in the Centrale Supélec (Gif sur Yvette, France) to explore control and methods for energy distribution in hybrid microgrids.
- Analyze weather datasets related to renewable energy sources.
- Develop classic, machine learning-based, and neural networks-based time series forecasting models to predict weather variables associated with renewable energy sources.
- Develop a reinforcement learning strategy for an smart electric distribution system.

Graduate Student, University of Campinas (Brazil) July 2014-July 2016

Advisor: João Mauricio Rosário.

- Development of signal processing algorithms to detect user intentions under the technique Steady-State Visually Evoked Potentials in brain signals using an EEG commercial sensor.
- Integrate an EEG sensor to a robotic arm, mobile robot, and domotic environment for human assistance.

Research Assistant, Military University Nueva Granada (Colombia) February 2014-July 2014

Advisor: Dario Amaya Hurtado.

- Develop a virtual laboratory for educational purposes of automation concepts using a PLC.
- Develop initial mathematical models for a virtual laboratory of a brewery.
- Implement a communication interface between the virtual laboratory software and the PLC.

Undergraduate student, Military University Nueva Granada (Colombia)

February 2012-December 2013

Advisor: Robinson Jiménez Moreno/ Dario Amaya Hurtado.

- Design of bio-inspired equine robot prototype.
- Simulation, implementation, and control of a commercial Drone.
- Develop an algorithmic approach for plants' pest damage recognition through image processing.
- Tank level regulation through fuzzy control and a Microsoft Kinect sensor.

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Campinas   August 2018-December 2018

Course: Control Theory

Responsibilities: Support teaching activities and offer academic support to 30 undergraduate students of mechanical engineering. Manage and support the virtual platform Moodle. Evaluate the assignments and exams.

Graduate Teaching Assistant, University of Campinas   February 2018-June 2018

Course: Control Theory and Intelligent Applications for Robotic Systems

Responsibilities: Develop five classes of 3-hour lectures and three laboratory sessions for 15 undergraduate students of automatic control and automation. Support and guide the development of final projects and in-course queries. Manage and support the virtual platform Moodle.

OTHER

Question Developer, ICFES (Colombian Institute for the Promotion of Higher Education)

2014-2015

Responsibilities: Develop questions for the quantitative reasoning area (logic and mathematics) for the Colombian national tests SABER and SABER-PRO.

MOST REMARKABLE PUBLICATIONS

1. **Cáceres Flórez, C. A**., Rosário, J. M., Amaya Hurtado, D. "Smart Management of Telemedicine Rooms in an e-Hospital Emergency Department". Enhanced Telemedicine and e-Health. Studies in Fuzziness and Soft Computing, vol 410. Springer, Cham. https://doi.org/10.1007/978-3-030-70111-6_4, **2021**.
2. **Cáceres Flórez, C. A**., Rosário, J. M., Amaya Hurtado, D. "Application of Automation and Manufacture techniques oriented to a service-based business using the Internet of Things (IoT) and Industry 4.0 concepts. Case study: Smart Hospital". Gestão & Produção, **2020**.
3. **Cáceres Flórez, Camilo Andrés**; Rosário, João Mauricio; Amaya, Dario. "Control structure for a car-like robot using artificial neural networks and genetic algorithms". Neural Computing and Applications, **2018**.

4. **Cáceres, Camilo**; Rosário, João; AMAYA, Dario. "Design, Simulation, and Control of an Omnidirectional Mobile Robot". International Review of Mechanical Engineering (IREME), v. 12, n. 4, p. 382, **2018**.
5. **Cáceres, Camilo**; Puerta, Juan; Jiménez, Robinson; Rojas, Diego. "Design of a Bio-Inspired Equine Robot Prototype". International Review of Mechanical Engineering, v. 10, p. 12-17, **2016**.
6. **Cáceres, C**.; Amaya, D. "Desarrollo e interacción de un laboratorio virtual asistido y controlado por PLC." Revista Entre Ciencia e Ingeniería, v. 19, p. 9, **2016**.
7. **Cáceres, Camilo**; Amaya, Dario; Rosário, João Mauricio. "Simulation, Model and Control of a Quadcopter AR Drone 2.0". International Review of Mechanical Engineering, v. 10, p. 197-202, **2016**.
8. **Cáceres, C**.; Rosario, J. M ; Amaya, Dario. "Approach to Assistive Robotics based on an EEG sensor and a 6-DoF robotic arm". International Review of Mechanical Engineering, v. 10, p. 253-260, **2016**.
9. **Cáceres, Camilo Andrés**; Mora Montañez, Jefry Anderson; Amaya, Dario. "Mathematical Modeling, Control and Simulation of a Suspension System with Energy Regeneration". International Review of Mechanical Engineering, v. 9, p. 377, **2015**.
10. **Cáceres Flórez, Camilo Andrés**; Ramos Sandoval, Olga Lucia; Amaya Hurtado, Dario. "Procesamiento de imágenes para reconocimiento de daños causados por plagas en el cultivo de Begonia semperflorens (flor de azúcar)". Acta Agronómica, v. 64, p. 273-279, **2015**.

PRESENTATIONS - INTERNATIONAL EVENTS

1. **Cáceres, Camilo**; Mora, Jefry; Rosário, Joao Mauricio; Dumur, Didier. "Data Science-based Sizing Approach for Renewable Energy Systems". IX International Congress of Engineering Mechatronics and Automation (CIIMA 2020), IEEE Explore. **2020**. – In the publishing process
2. **Cáceres, Camilo**; Rosário, Joao Mauricio; Amaya, Dario. "Towards Health 4.0: e-Hospital Proposal Based Industry 4.0 and Artificial Intelligence Concepts". AIME 2019: Artificial Intelligence in Medicine. Springer, **2019**.
3. **Cáceres, Camilo**; Rosário, Joao Mauricio; Amaya, Dario. "Proposal of a Smart Hospital Based on Internet of Things (IoT) Concept". Processing and Analysis of Biomedical Information. Springer Nature, **2019**.
4. **Caceres, Camilo**; Rosario, Joao Mauricio; Amaya, Dario. "Application of Manufacturing and Automation techniques oriented to a service-based business using Internet of Things (IoT) and Industry 4.0 concepts. Case Study: Smart Hospital". 2nd International Symposium on Supply Chain 4.0, **2018**.
5. **Caceres, Camilo**; Rosario, Joao Mauricio; Amaya, Dario. "Approach of Kinematic Control for a Nonholonomic Wheeled Robot using Artificial Neural Networks and Genetic Algorithms". International Conference and Workshop on Bioinspired Intelligence (IWOBI), **2017**.

HONORS AND AWARDS

Student Travel Award, Artificial Intelligence in Medicine, € 550.00	2019
Nominated Paper - Best paper award, SC4 Research Network on Supply Chain	2018
Certificate of Academic Excellence, Bavaria S.A.	2014
Undergrad Scholarship to the student with the highest GPA each semester- 2013/I, Military University Nueva Granada	2013
Certificate of Academic Excellence, Bavaria S.A.	2010
Most remarkable high school student, Colegio Emmanuel d'Alzon	2008

COMMUNITY SERVICE AND OUTREACH

Journal Reviewer

DYNA (Medellín, Colombia)	2014-2018
Información Tecnológica (La Serena, Chile)	2018
Revista Ingeniería Industrial (Lima, Perú)	2020

Journal Ad Hoc Reviewer

Intelligent Service Robotics. Springer Nature	2020

External Researcher

GAV research group, Military University Nueva Granada	2014-2020

MAIN INFORMAL EDUCATION/ ONLINE COURSES/ MOOCs

Tensorflow Developer Specialization – Coursera/ Deeplearning.ai (2021)
Deep Learning Specialization – Coursera/ Deeplearning.ai (2020)
Machine learning Algorithms – Coursera/AIMII (2020)
Deep Learning with Python Track – DataCamp (2021)
Data Analyst with Python Track – DataCamp (2018)
Introduction to IoE/ IoT – Cisco Networking Academy (2017)
Cognitive Neuroscience Robotics – Edx Osaka University (2016)

LANGUAGES

Spanish: Native Language
English: Advanced
Portuguese: Advanced
French: Basic