Carlos Quintero-Peña

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Houston, TX USA

Education

Rice University   Houston, TX USA
Ph.D in Computer Science   *Aug 2019 - Present*

Universidad de los Andes   Bogotá, Colombia
MSc in Electronic and Computer Engineering - GPA: 4.44/5.0   *March, 2011*
Thesis: Embeddings, connectivity and minimum spanning trees in dimensionality reduction

Universidad de los Andes   Bogotá, Colombia
BSc Electronic Engineer - GPA: 4.16/5.0   *September, 2009*
Graduation project: Hardware/software implementation of Adaboost

Research Experience

Researcher   January, 2018 - July, 2019
Universidad de los Andes   *Bogotá, Colombia*

- Supervised three graduation projects of undergraduate students that involved social robots design, machine learning, natural language processing and digital system design.

- Collaborated with other researchers to create a competition for students based on ROS to solve the Pac-Man game using artificial intelligence

- Co-founded and lead the team SinfonIA that participated in the Home Social Standard Platform League of RoboCup in 2019

Researcher   January, 2014 - December, 2017
Universidad Santo Tomás   *Bogotá, Colombia*

- Trained and tested a model capable of recognizing human emotions using multimodal signals and deep learning

- Experimented with several algorithms for autonomous path planning and simultaneous localization and mapping for a home-assistant robot

- Developed an environment for the validation of cooperative robot techniques

- Supervised several graduation projects for undergraduate students in electronic system design, machine learning and robotics

Team member, STOx's robot soccer team   January, 2014 - December, 2017
Universidad Santo Tomás   *Bogotá, Colombia*

- Obtained fourth place at RoboCup 2015

- Wrote all qualification team description papers from 2014 to 2017

- Developed and implemented a real-time data-driven chip kick predictor algorithm

- Developed and implemented an optimization algorithm to create dynamic offensive plays

- Developed an optimal assignment algorithm to pair agents and tasks for robotic soccer

Research assistant   January, 2011 - June, 2011
Universidad de los Andes   *Bogotá, Colombia*
- Developed a ranking algorithm using preference pairwise comparisons for movie ratings based on graph theory

Teaching Experience

Algorithmic Robotics (COMP 450/550)   August, 2022 - December, 2022
Teaching Assistant   *Rice University, Houston TX*
Algorithmic Robotics (COMP 450/550)   August, 2020 - December, 2020
Teaching Assistant   *Rice University, Houston TX*
Robotics, Analog Electronics   August - December, 2019
Lecturer   *Universidad de los Andes, Colombia*
Electronic Digital Systems, Analog Electronics   January - May, 2018
Lecturer   *Universidad de los Andes, Colombia*
Operating Systems   January 2014 - December 2017
Lecturer   *Universidad Santo Tomás, Colombia*
Artificial Intelligence   August - December, 2016
Lecturer   *Universidad Santo Tomás, Colombia*
Optimization, Digital Systems   August 2008 - December 2010
Teaching Assistant   *Universidad de los Andes, Colombia*

Working Experience

Research and development engineer   October, 2011 - July, 2012
Accelogic LLC   *Sunrise, FL*
- Conducted research of several state of the art topics of the company's interest, specifically in the field of high performance computing

- Involved in the design, development, benchmark, testing and documentation of the company's algorithm-based products and prototypes

- Provided technical support for a GPU/FPGA/CPU Linux-based system

- Involved in the preparation of several government funding opportunities and patents

- Proposed and implemented direct and iterative algorithms for the solution of large scale linear systems, eigenvalue problems and general matrix computations

Selected Publications

- **Quintero-Pena, C**., Kingston, Z., Pan, T., Shome, R., Kyrillidis, A., and Kavraki, L.E. Optimal Grasps and Placements for Task and Motion Planning in Clutter. IEEE ICRA 2023.

- **Quintero-Pena, C**., Chamzas, C., Sun, Z., Unhelkar, V. and Kavraki, L.E. Human-Guided Motion Planning in Partially Observable Environments. IEEE ICRA 2022.

- Chamzas, C., **Quintero-Pena, C**., Kingston, Z., Orthey, A., Rakita, D., Gleicher M., Toussaint, M. and Kavraki, L.E. MOTION BENCH MAKER: A Tool to Generate and Benchmark Motion Planning Datasets. IEEE Robotics and Automation Letters, November 2021.

- **Quintero-Pena, C**., Kyrillidis, A. and Kavraki, L.E. Robust Optimization-based Motion Planning for high-DOF Robots under Sensing Uncertainty. IEEE ICRA 2021.

- Chamzas, C., Kingston, Z., **Quintero-Peña C**., Shrivastava, A., and Kavraki, L.E. Learning Sampling Distributions Using Local 3D Workspace Decompositions for Motion Planning in High Dimensions, IEEE ICRA 2021. (Top-4 finalist for best paper in Cognitive Robotics)

- **Quintero, C**., Uribe, R., Calderón, J., Lozano, F. Online pairwise ranking based on graph edge connectivity. In Innovations in Bio-inspired Computing and Applications, 2015.

- **Quintero, C.,** Rodríguez, S., Pérez, A., López, J., Rojas, E., Calderón, J. Learning soccer drills for the small size league of RoboCup. In Lecture Notes on Artificial Intelligence, Springer 2015.

- **Quintero, C**., Lozano, F. Locally linear minimum spanning trees for manifold learning. In 12th International Conference on Machine Learning and Applications ICMLA 2013.

Awards, Grants & Honours

IEEE RAS ICRA 2022 Studen Travel Grant 2022
Fulbright Scolarship 2019
IEEE EVIC 2008 Student Travel Grant 2008

Skills

- Extended experience programming in C/C++, MATLAB and Python, experience programming in R, Fortran and Java

- Experience in Robotics Development Tools: ROS, Gazebo, VRep, MoveIt, Robowflex

- Extended experience in hardware description languages VHDL and Verilog for FPGA implementation

- Linux-based and Windows systems

- **Languages:** Spanish (native), English (fluent)