Carlos Quintero Peña

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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, 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**., Chamzas, C., Sun, Z., Unhelkar, V. and Kavraki, L.E. Human-Guided Motion Planning in Partially Observable Environments. Accepted to appear at 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

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)