Yuri G. Rocha

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Education

Sep. 2018 – Aug. 2020 (expected) **M.Sc., Electrical and Computer Engineering**, *Sungkyunkwan University*, Suwon, South Korea.
- *Research:* Robot Mental Simulation for Autonomous Learning and Planning;
- *Courses:* Neural Networks, Machine Learning, Robotics, Linear Systems, Advanced Probability and Random Processes;
- *GPA:* 4.4/4.5

Mar. 2011 – Dec. 2016 **B.Sc., Control and Automation Engineering**, *University of Brasilia*, Brasilia, Brazil.
- *Research:* Methods for visual communication and cooperative control between humanoid robots;
- *Courses:* Computer Vision, Digital Control, Object-Oriented Programming, Computer Architecture;
- *GPA:* 4.1/5.0

Sep. 2014 – Aug. 2015 **Exchange B.Sc., Computer Engineering**, *Sungkyunkwan University*, Suwon, South Korea.
- *Courses:* System Programming, Computer Graphics, Microprocessors, Programming Languages;
- *GPA:* 4.1/4.5

Professional Experience

Vocational

Aug. 2016 – Jul. 2017 **Developer**, *Moringa Digital*, Brasilia, Brazil.

Function:
- Developed a web service in NodeJS to automate the integration between the database of the company and client databases. This integration reduced the required time to operate the platform and became one of the main selling points of the company. Worked directly with the client's technology team to set goals and deadlines;
- Back-end development of several websites.

Acquired Knowledge:
- Javascript, NodeJS, MySQL and Classic ASP.

Jul. 2015 **Intern**, *Hyundai Motor Company*, Namyang, South Korea.

Function:
- Analyzed the car assembly line and proposed a new mounting process. This proposal aimed better ergonomics, reducing the risk of workers' injuries due to prolonged sub-optimal body posture.

Acquired Knowledge:
- Car assembly process and methods of research and development of new products.

Miscelaneous

Aug. 2015 – Dec. 2016 **Team Leader**, *UnBeatables – Humanoid Robot Soccer*, Brasilia, Brazil.
- Team leader for the UnBeatables team, that participated in the Robocup competition in the context of the Standard Platform League - Drop-In. Coordinated the activities of the team, developed code for participation in competitions (Robocup and LARC) and performed administrative tasks;
- Developed the multi-threaded code architecture, UDP communication module, behavior management and integrated a new humanoid motion algorithm. The code development was done in C++ and Python.

Research Experience

Sep. 2018 – Present
Control and Robotics Lab, *Graduate Student Researcher*, Sungkyunkwan University.
- Took part in the development of a Semantic Knowledge Framework for environmental and internal representation;
- Created an automatic mental simulation system, allowing robots to simulate themselves and the environment without human aid. Done using the ROS system and Gazebo Simulator;
- Developed Reinforcement Learning algorithms for navigation and hybrid planning methods.

Jan. 2014 – Dec. 2016
Laboratory of Robotics and Automation, *Undergraduate Student Researcher*, University of Brasilia.
- Derived the mathematical definition for bi-manual manipulation by using the dual quaternion algebra on the NAO robot, focusing on the dual cooperative task-space;
- Implemented control strategies on NAO platform and Simulated environment V-Rep. In this context, also studied strategies for singularity avoidance and joint limit avoidance. The project was done using the ROS system;
- Developed a visual communication algorithm between different robots, implemented using OpenCV.

Social Engineering Activities

Aug. 2015 – Dec. 2016
Team Leader, *UnBeatables: Social Activities*, Brasilia, Brazil.
- Went to schools, children hospitals, and science fairs to showcase robots and to inspire kids following STEM careers in their future.

Jan. 2013 – Aug. 2014
Voluntary Teacher, *Electron Project*, Brasilia, Brazil.
- Gave Electronics and Programming lessons for high school students attending public schools, encouraging them to learn about and apply for Engineering Programs at University.

Publications

Peer-Reviewed Conferences

Y. G. Rocha and T. Y. Kuc. Mental simulation for autonomous learning and planning based on triplet ontological semantic model. *CEUR Workshop Proceedings*, 2487:65–73, 2019.

Y. G. Rocha, S.-H. Joo, E.-J. Kim, and T.-Y. Kuc. Automatic generation of a simulated robot from an ontology-based semantic description. *제어로봇시스템학회 국제학술대회 논문집*, pages 1340–1343, 2019.

C. M. de Farias*, Y. G. Rocha*, L. F. C. Figueredo, and M. C. Bernardes. Design of singularity-robust and task-priority primitive controllers for cooperative manipulation using dual quaternion representation. In *2017 IEEE Conference on Control Technology and Applications (CCTA)*, pages 740–745. IEEE, 2017.

Grants and Awards

Dec. 2019
Award for Academic Achievement as a Korean Government Scholarship Student.
Received in recognition of academic achievement - Granted by the Korean Ministry of Education.

Sep. 2017 – Aug. 2020
Korean Government Scholarship Program (KGSP) for Graduate Students Grantee.
Three years scholarship as a Graduate Student at Sungkyunkwan University - Granted by the National Institute for International Education (NIIED).

Languages

Portuguese **Native**

English **Fluent** *TOEFL IBT Score: 114/120*

Korean **Upper-Intermediate** *TOPIK 5*

March 31, 2020