Rômulo Cerqueira

Senior Robotics Engineer | Tech Lead

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Resume PDF

CAREER PROFILE

Experienced Software Engineer in developing autonomous robots, mainly for the underwater domain. Has a solid base in Robotics system design, Acoustics, Simulation, Perception, Navigation, and Team Leadership. Skilled in C/C++, Python, Ruby, ROS1/ROS2, Rock, Gazebo, OpenSceneGraph, Docker, Boost, Qt, and Git development in Linux. Strong research professional with a doctorate focused on Robotics, and several scientific papers and patents published.

At SENAI CIMATEC, I contributed to the development of FlatFish project, an autonomous underwater vehicle for repeated inspections of deep-sea oil and gas installations. Later, I led the JIRo project, which involved creating a robotic tool for cleaning and inspecting offshore flexible joints.

At Kraken Robotics, I worked on the ThunderFish XL project, a long-range autonomous survey vehicle with hover capabilities for close-range inspections. Currently, I am leading the JellyFish project, an autonomous underwater vehicle for deep seabed mapping and monitoring.

EXPERIENCES

Senior Robotics Engineer | Tech Lead

2022 - Present

Kraken Robotics, Salvador, Brazil

At Kraken Robotics, I hold the dual roles of Technical Coordinator for the JellyFish project and Software Developer. As the Technical Coordinator, I effectively coordinate the development of cutting-edge robot technology. In my capacity as a Software Developer, I specialize in developing essential components such as device drivers, sensor simulation, navigation capabilities, seamless software integration in ROS2 framework, and proposing software architecture enhancements.

Senior Robotics Engineer | Tech Lead

2022 - 2022

SENAI CIMATEC, Salvador, Brazil

I led the second phase of JIRo project in cooperation with Oceaneering International.

Senior Robotics Engineer | Tech Lead

2018 - 2022

SENAI CIMATEC, Salvador, Brazil

As the technical leader of an international engineering team on the JIRo project, I was responsible for:

- Coordinating end-to-end robot technology development, design, validation, and verification;
- Defining system functionalities, with a focus on reusability and reliability;
- Assessing robot capabilities and planning system improvements in order to meet project requirements;
- Driving the software team, including simulation, integration of software components, perception, testing, and peer code review with ROS framework;
- Integrating and testing the JIRo robot with Saab Seaeye's Cougar-XTi ROV;
- Coordinating sea trials and deployment;
- Working in close collaboration with DFKI GmbH team for robot development and testing, and project management.

The JIRo project garnered interest from multiple companies, resulting in the licensing of robot technology to Oceaneering for commercial use. Oceaneering has since been enhancing the robot's capabilities.

Robotics Engineer

2014 - 2017

SENAI CIMATEC, Salvador, Brazil

As part of the software and integration team of the FlatFish project, I was responsible for:

- Developing an imaging sonar simulator (singlebeam and multibeam types) for preliminary AUV testing;
- Developing a pipeline tracking system based on acoustic images;
- Developing an obstacle avoidance system, from filtering obstacles to planning avoidance paths, to ensure safe navigation of the AUV;
- Developing device drivers and deploying systems on the AUV;
- Conducting software integration, testing, peer review, and debugging with Rock framework;
- Gaining experience in operating robotic systems at sea;
- Working in close collaboration with the DFKI GmbH team for AUV software development and testing in Bremen, Germany.

The successful trials resulted in the licensing of FlatFish technology to SAIPEM, leading to significant improvements in the AUV capabilities for commercial use.

IT Architect Trainee

2012 - 2014

Oi S.A., Rio de Janeiro, Brazil

Special career program for technical development on IT architecture, comprising:

- End-to-end solution design based on business needs using market and enterprise standards as TM Forum Frameworx, TOGAF, and SOA;

EDUCATION

PhD in Mechatronics
Federal University of Bahia
2014 - 2019

PgD in Network Eng. and IT
National Institute of Telecommunications
2012 - 2012

MSc in Electrical Engineering
Federal University of Bahia
2010 - 2012

BSc in Computer Science
State University of Santa Cruz
2006 - 2009

LANGUAGES

Portuguese (Native)

English (Professional)

INTERESTS

Soccer

Tennis

Gaming

- Maintenance of enterprise as-is, transition, target and reference architectures;
- Delivering solutions involving CRM, Cloud, Charging, Billing and OSS/BSS applications.

Unix Linux System Administrator 2010 - 2010
ecGlobal, Salvador, Brazil

Design and maintenance of Linux/Unix applications and services, including DHCP, DNS, Apache, Samba, server virtualization, LAMP, CUPS, AWStats, and SVN; creation of Ubuntu-based distro for software team development.

Software Engineer 2009 - 2010
ecGlobal, Salvador, Brazil

Development of social networks for online market research and e-commerce applications using PHP/JavaScript/Ajax, CSS, Elgg framework, and MySQL and PostgreSQL databases.

MAIN PUBLICATIONS

- A rasterized ray-tracer pipeline for real-time, multi-device sonar simulation
R. Cerqueira, T. Trocoli, J. Albiez and L. Oliveira
Elsevier Graphical Models Journal, 2020.

- A novel GPU-based sonar simulator for real-time applications
R. Cerqueira, T. Trocoli, G. Neves, S. Joyeux, J. Albiez and L. Oliveira
Elsevier Computers & Graphics Journal, 2017.

- Repeated close-distance visual inspections with an AUV
J. Albiez, D. Cesar, C. Gaudig, S. Arnold, R. Cerqueira, T. Trocoli, G. Mimoso, R. Saback and G. Neves
OCEANS MTS/IEEE Monterey, 2016.

- The Rock-Gazebo Integration and a Real-Time AUV Simulation
T. Watanabe, G. Neves, R. Cerqueira, T. Trocoli, M. Reis, S. Joyeux and J. Albiez
12th Latin American Robotics Symposium (LARS), 2015.

- From Reactive to Cognitive Agents: Extending Reinforcement Learning to Generate Symbolic Knowledge Bases
R. Cerqueira, A.L. da Costa, S. McGill, D. Lee and G. Pappas
12th Latin American Robotics Symposium (LARS), 2013.

SKILLS & PROFICIENCY

Robotics
Autonomous Systems
Acoustics
Perception
Simulation
Machine Learning
Team leadership
IT Architecture