

Ermano A Arruda

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PROFESSIONAL EXPERIENCE

Staff Robotics Software Engineer (AI/ML) - Kinisi Robotics, UK Oct 2024 - Present
Focus: robot learning for bi-manual manipulation, training and deployment of imitation learning approaches, applied research. Developing packages for imitation learning, data gathering tools for model training via teleoperation, and overseeing training and deployment life-cycle.

Associate Principal Robotics Research Engineer - Dyson, UK Oct 2019 - Oct 2024
Focus: robot manipulation, robot learning, team management, technical leadership.

Research Internship - Honda Research Institute Europe GmbH, Offenbach, Germany Sep 2018 - Nov 2018
Focus: robot grasping and manipulation research.

School of Computer Science - University of Birmingham

Teaching Associate - Software Workshop I, Graphics, Intelligent Robotics Oct 2015 - Sep 2018

- Teaching introductory programming course with Java at the University of Birmingham. Assisting on Computer Graphics and Intelligent Robotics modules, supervising mini-projects and assisting on assignments.

Research Internship - VoxarLabs Recife, Pernambuco, Brazil
Sep 2012 - Oct 2015

- Visual tracking for virtual and augmented reality interaction in projects such as AnimAR and FishTankVR.
- Member of the Voxar Robotics team in partnership with the Recife Center for Advanced Studies and Systems (CESAR, in Portuguese), working on the VoxarBrain project.

Center for Informatics (CIn) - Federal University of Pernambuco Recife, Pernambuco, Brazil
Graphical Processing Jan 2013 - Sep 2013
Algorithm & Data Structures Aug 2011 - Sep 2013
Introduction to Programming Feb 2011 - Aug 2011

- Gave revision lectures, elaborated programming puzzles, supervised projects, and marked exercises.

EDUCATION

PhD - University of Birmingham (UoB), School of Computer Science, UK Sep 2015 - Oct 2019
Thesis: Generative and predictive models for robust manipulation.
Focus: robot manipulation, robot learning, active perception, computer vision.

Bachelor in Computer Science - Center for Informatics (CIn), Federal University of Pernambuco (UFPE), Brazil - GPA: 9.03/10.0 2010 - 2015
Algorithms and Data Structures (96%), Intelligent Systems (91%), Linear Algebra (80%), Communication Infrastructure (98%), Data and Information Management (91%), Graphical Processing (95%), Computer Language Paradigms (99%), etc.

Affiliate Computer Science and Software Engineering - University of Birmingham, UK - 78% 2013 - 2014
Intelligent Robotics (85%), Advanced Robotics (91%), Parallel Programming (87%), Computational Vision (75%), Operating Systems with C/C++ (80%), Machine Learning (74%), Neural Computation (70%), etc.

PUBLICATIONS

- Ermano Ardiles Arruda, *3D cleaning tool path generation*. GB Patent GB2615994 (A), 2023. More details at <https://patents.google.com/patent/GB2615994A>.
- Ermano Arruda, Claudio Zito, Mohan Sridharan, Marek Kopicki, Jeremy L. Wyatt, *Generative grasp synthesis from demonstration using parametric mixtures*. Task-Informed Grasping (TIG-II): From Perception to Physical Interaction, Robotics: Science and Systems (RSS), 2019.
- Ermano Arruda*, Michael J Mathew*, Marek Kopicki, Michael Mistry, Morteza Azad, Jeremy L Wyatt, *Uncertainty Averse Pushing with Model Predictive Path Integral Control*. In Proceedings of IEEE International Conference on Humanoid Robots (Humanoids), 2017.
- Ermano Arruda, Jeremy Wyatt, Marek Kopicki, *Active vision for dexterous grasping of novel objects*. In Proceedings of IEEE International Conference on Intelligent Robots and Systems (IROS), 2016.

- Lucas Figueiredo, Edvar Vilar Neto, Ermano Arruda, João Marcelo Teixeira, Veronica Teichrieb, *Fishtank Everywhere: Improving Viewing Experience Over 3D Content*, In Proceedings of the 16th International Conference on Human-Computer Interaction, Crete, Greece, June 22-27, 2014. Springer.

AWARDS

- First place at ISMAR Off-site Tracking Competition 2015, Fukuoka, Japan.** 2015
Implemented a monocular visual odometry system with additional sparse bundle adjustment for camera trajectory optimisation.
- Member of the winning team CESAR-VoxarLabs at LARC/CBR – Latin American and Brazilian Robotics Competition, RoboCup@Home.** 2014
Implemented an object-tracking and detection system based on state-of-the-art long-term tracking algorithm Tracking-Learning-Detection (TLD).
- AnimAR application – Grand Prize Winner for Metaio’s GotHeARt Competition (InsideAR 2013, Munich, Germany).** 2013
Augmented Reality android application for storyboard design and animation.

TECHNICAL SKILLS

Robotics	ROS2, Orocos
ML	Torch
Simulation tools	IsaacSim, Bullet, MuJoCo, Gazebo
Programming Languages	C/C++, Python, Java, Lua, Matlab, C#
Version Control	Git, SVN

LANGUAGES

- English (Fluent), Portuguese (Native)

PROJECTS

- Grip** 2024
- Grip is an open-source prototyping toolbox for robot manipulation research written in python. Project page: <https://github.com/dyson-ai/grip>
- PaCMan project - Active perception for robotic grasping** 2016
- Focused on next-best-view planning for improving grasp performance. Responsible for the final integrated demo of the PaCMan project with active vision system for next-best-view planning. See <http://www.pacman-project.eu/>.
- ToyDQN, implementation of the Deep Q Network (DQN) algorithm for a few toy examples - Lua, Torch7, Love2d** 2016
- An open-source personal summer project on deep reinforcement learning available at <https://github.com/ea3/DeepQLearning>.
- Simple Tracking and Mapping (STAM), visual odometry algorithm - C/C++, OpenCV** 2015
- A monocular visual odometry system with additional sparse bundle adjustment for trajectory optimisation. The system ranked first place at the International Symposium on Mixed and Augmented Reality (ISMAR) 2015 Off-site Tracking Competition.
- SLAM_X, A Graph-based SLAM system for mobile robots - Robot Operating System (ROS), C/C++, PCL, OpenCV** 2015
- Final year project on SLAM techniques with applications on robot perception. The system was quantitatively evaluated on the TUM RGB-D SLAM Benchmark dataset. Video demonstration available at https://youtu.be/-ZV9gk_Hw84.
- VoxarBrain, I-Zak’s brain, the robot who won LARC/CBR RoboCup@Home Competition - C/C++, OpenCV, PCL** 2015
- Object tracking, recognition and pose estimation for the I-Zak robot.

EXTRA CURRICULAR EXPERIENCE

- University of Birmingham Drone Forum - IT Innovation Centre** 2016 - 2018
- Engage with researchers, students, and hobbyists by creating an environment for discussion, research, and development of drone-related technologies and applications. Some of our work involved in-campus research activities to improve WiFi coverage, see more at this [link](#).