Ermano A Arruda

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EDUCATION

PhD Student at the University of Birmingham (UoB), School of Computer Science, UK 2015 - Present
Control and perception for robust manipulation from demonstration.
Current research focus: robot manipulation, active perception, computational vision, reinforcement learning.

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 (Occasional), 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 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

Databases	Oracle DBMS, PostgreSQL
Development Tools	Visual Studio, Eclipse, QtCreator, Android Studio, Sublime, CMake
Programming Languages	C/C++, Python, Java, Lua, Matlab, C#
Web	Python with Django Framework, HTML/CSS, Javascript
Version Control	Git, SVN

LANGUAGES

- English (Fluent), Portuguese (Native)

PROJECTS

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/eaa3/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

- Worked on object tracking, recognition and pose estimation for the I-Zak robot.

Call a Metting, Call a Meeting Robot Task - C/C++, Python, Java, Robot Operating System (ROS), OpenNI 2013

- Implemented the vision node with ROS, which included person recognition algorithm with false positive filtering based on shape similarity using a k-nearest-neighbour classifier.

AnimAR, android application for storyboard design and animation - Android, OpenCV and MetaioSDK 2013

- Implemented an algorithm for extracting rectified animation frames from storyboard pages for creating animations.

FishTankVR, FishTank Virtual Reality System - C/C++, OpenCV and OpenGL 2013

- Dynamic view perspective change via head-tracking.

PROFESSIONAL EXPERIENCE

School of Computer Science - University of Birmingham Birmingham, UK

Teaching Associate - Software Workshop I October 2015 - April 2016

- Small group teaching and exercise marking on introductory programming course with Java at the University of Birmingham.

VoxarLabs Recife, Pernambuco, Brazil

Research Internship September 2012 - October 2015

- Worked on 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 January 2013 - September 2013
Algorithm & Data Structures August 2011 - September 2013
Introduction to Programming February 2011 - August 2011

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

EXTRA CURRICULAR EXPERIENCE

University of Birmingham Drone Forum - IT Innovation Centre 2016 - Present

- Our goal is to engage researchers, students, and hobbyists by creating an environment for discussion, research, and development of drone-related technologies and applications.

Programme of Tutorship and Education (PET) - Federal University of Pernambuco 2012 - 2015

- Taught basic informatics to the community and university staff, performed department tours for high school visitors. Also promoted environmental and social campaigns such as food donation, blood donation, and recycling digital waste.
- Organized workshops and tutorials to the students of the Center for Informatics (CIn).