

# RAUL DE QUEIROZ MENDES

Multidisciplinary engineer pushing the boundaries of robotic vision and machine learning

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## EXPERIENCE

**TU/e** PhD position in mechanical engineering at the Robotics research group (RBT) of the Eindhoven University of Technology (TU/e)

**Eindhoven University of Technology**

05/2022 – Present

PhD Project: Visuotactile Robotic Perception and Physics-Informed Scene Representation

- Main work is the EMDAIR project I.Touch2See, funded by the EAISI institute
- Developing a cognitive Bayesian model to fuse proprioception and visuotactile input for robotic manipulation in semi-structured settings
- Developing advanced vision-based perception algorithms that include 3D reconstruction and multi-object pose estimation for robotic systems
- Collaborating with the joint project on visuo-tactile integration for shape reasoning together with the I.Touch2See group
- Supervising bachelor's and master's students
- Preparing demos, presentations, and reports. Quoting equipment to purchase, supporting students on lab hardware and software
- Supporting the Robotics lab with respect to maintenance of the robotic dual-arm setup, tracking of equipment, and workspace organization



Product Development Intern

**Whirlpool**

2018 – 2019

- Development of intelligent algorithms to control washing machines
- Planning, execution and analysis of test data following the six-sigma methodology
- Elaboration of requirements (voice translation of the consumer for engineering requirements) with a multifunctional team
- Elaboration of failure analysis (FMEA)
- Participation in the area's forums
- Other day-to-day engineering activities like product and process mapping

## EDUCATION

PhD Degree Eindhoven University of Technology

**Eindhoven University of Technology**

- PhD position in mechanical engineering
- Project funded by EAISI
- Promoter: Alessandro Saccon
- Supervisors: Alessandro Saccon and Andrei Jalba

## SUMMARY

Multidisciplinary engineer and researcher with a strong academic foundation in Electrical and Mechanical Engineering, specializing in Computer Vision, Machine Learning, and Robotics.

Experienced in applying deep neural networks, structure from motion, stereo vision, and visual servoing methods to robotics applications, including manipulation, scene representation, object localization, and shape reconstruction.

Known for academic rigor, algorithm development, and real-world testing, with a growing track record of high-impact publications.

Currently in the final phase of a PhD at TU/e with ambitions to continue in an R&D or applied Computer Vision/AI/Robotics role in the Netherlands.

Highly mobile, multilingual, and deeply committed to long-term integration into the Dutch high-tech ecosystem.

## LANGUAGES

Portuguese  
Native



English  
Proficient



Spanish  
Proficient



## SKILLS

AGX Dynamics

Basler Pylon

Blender

C/C++

COLMAP

Franka Emika libfranka

Librealsense

MATLAB

mc\_rtc

MeshLab

Open3D

OpenCV

Optitrack Motive

PyTorch

Pyrender

Python

ROS

# EDUCATION

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MSc degree: Academic master's course in  
Electrical Engineering

São Carlos School of Engineering, University of São Paulo

Thesis Title: Deep Learning Applied to Monocular Depth  
Estimation: An Approach Based on Attention and Complementation

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Undergraduate degree: Bachelor's degree in  
Electrical Engineering

Federal University of São Carlos

Course Completion Title: Cloud-based Hybrid Location System for  
Indoor and Outdoor Environments

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Other projects: Development of a Low-Cost Optical Lithography  
System

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**Academic Merit Award**

Engineering Institute of São Paulo

# PROJECTS & ACTIVITIES

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Research projects carried out:

-  DYNAMO: Vision-Initialized Physics-Based Dynamic Motion Prediction for Object Manipulation
-  UNO: Unified Model-Based and Model-Free Orientation Estimation Under Symmetry and Occlusion Ambiguity
-  I.Touch2See: Visuo-Tactile Integration for Shape Reasoning
-  MORPHO: Model-Free Object Reconstruction and Pose Hypothesis Optimization
-  Second-Order Position-Based Visual Servoing of a Robot Manipulator
-  On Deep Learning Techniques to Boost Monocular Depth Estimation for Autonomous Navigation
-  Real-Time Deep Learning Approach to Visual Servo Control and Grasp Detection for Autonomous Robotic Manipulation
-  Dynamic Parameter Identification of a 7-DoF Lightweight Robot Manipulator Using Probabilistic Optimization

Scikit-learn

TensorFlow

Zivid python

# INTERESTS

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1. Cooking
2. Cycling
3. Dogs
4. Games
5. Gym
6. Movies
7. Rock music