

Letter of Reference – Ricardo Morim

To whom it may concern,

As a researcher at INESC TEC and Professor at the Faculty of Engineering of the University of Porto (FEUP), I had the pleasure of supervising the summer internship of student Ricardo Morim within the ArNavAI project (an indoor navigation system using augmented reality), carried out from July to September 2025 at INESC TEC.

During this period, Ricardo took on responsibilities in the analysis, planning, and development of a functional augmented reality (AR) navigation prototype for Android, including requirements definition, organising the work into weekly sprints, and providing regular progress reports. On the technical side, he worked on the frontend (client) with C#, Unity, and AR Foundation, complemented by a Python (FastAPI) backend containerised with Docker for waypoint management, and integrated additional features such as Text-to-Speech for voice-guided navigation. These components were essential to demonstrate the feasibility of the indoor navigation concept using QR codes and a compass across diverse scenarios such as schools, public buildings, museums, hospitals, etc.

The result was the delivery of a functional MVP capable of guiding users in real environments, validating the chosen approach. I also highlight his ability to diagnose and resolve problems systematically under several constraints, notably in debugging (e.g., identifying and fixing inadvertent UI recursion and dealing with compass access limitations in Unity's new input system), demonstrating critical thinking, autonomy, and resilience.

Ricardo showed directly relevant competencies:

- C# (with a natural transfer to ASP.NET and Cloud ecosystems),
- Architectural design and graph modelling,
- Containerisation and services with Docker/FastAPI,
- Agile methodologies and teamwork,

- Rapid learning of new technologies and independent research.

On the behavioural side, Ricardo demonstrated proactivity, organisation, clear communication in both in-person and online meetings, and a collaborative, responsible attitude. My overall assessment is very positive: he is a young engineer with excellent potential, autonomy, and technical maturity above the average for his level, ready to join international teams and demanding environments.

I remain fully available to provide any further information.

Porto, 15 October 2025

Yours sincerely,

Prof. Fernando Cassola Marques

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