**Digital Twin for the Azores Free Technological Zone (DATAz)**

**Project Proposal – Bernardo Chagas, 103639**

**Context**

This project is part of my master’s thesis, carried out within the Digital Twin for the Azores Free Technological Zone (DATAz) initiative. The overarching objective is the development of a Digital Twin of the Ocean (DTO). Given the scale of this endeavor, the work has been divided into three main tasks:

* Infrastructure and Data Preparation
* Digital Twin Development
* Testing, Validation & Operationalization

**Objectives**

At this early stage, I do not yet have access to the project data. However, it is expected that I will receive the necessary resources and define my main research focus in the coming week.

My anticipated contribution is the research and development of data-driven models that can be integrated with Computational Fluid Dynamics (CFD) simulations. The goal is to reduce the computational cost of these simulations by leveraging efficient surrogate modeling techniques.

**Approach**

Data Preparation – Since the performance of data-driven models depends heavily on data quality, part of the work will involve understanding, preprocessing, and adapting the datasets.

Model Development – I will explore AI and machine learning approaches to complement CFD simulations, with the aim of better analyzing, defining, and refining suitable methods as the project evolves.

Integration & Validation – The developed models will be tested and validated as components of the DTO framework.

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