



SUPERVISOR INFORMATION	
First and Last name	João Poças Martins
URL of supervisor webpage	https://sigarra.up.pt/feup/en/FUNC_GERAL.FORMVIEW?p_codigo=249597
Department	Civil Engineering and Georessources
Field(s) of research	BIM, Digital Construction
PROJECT PROPOSAL	
Title (optional)	Model Context Protocol as a Semantic Backbone for Sustainable BIM Lifecycle Management
Brief project description	
<p>Focusing on semantic enrichment and intelligent querying, this project positions the Model Context Protocol (MCP) as a foundational layer for managing openBIM data throughout the construction lifecycle, with emphasis on environmental performance and circularity. By integrating MCP with openBIM standards such as IFC, COBie, and BCF, the research aims to enable context-aware data structuring and querying that supports sustainability-driven decision-making across design, construction, operation, and decommissioning phases.</p> <p>The project will explore how MCP can be used to enrich BIM models with lifecycle and sustainability metadata, and how this enriched context can be queried to support tasks such as carbon footprint analysis, material reuse planning, and IEQ monitoring. It will also investigate the potential of combining MCP with semantic web technologies and language models to interpret unstructured data and facilitate natural language interaction with BIM models.</p> <p>Prior Knowledge Required</p> <p>The researcher should have a solid understanding of Building Information Modeling (BIM), particularly openBIM standards such as IFC and COBie. Experience with BIM tools, and programming skills in Python or similar languages for data manipulation and querying will be highly beneficial. Knowledge of Model Context Protocol and interest in digital twins or lifecycle data management is strongly recommended.</p>	