Dimitris Mavrokapnidis

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Profile

5+ years of research and working **experience** in complex systems thinking, information modeling, data science, and the Internet of Things in the context of the **built environment**.

Driven by the creation of practical **software** and **data architectures** that provide scalable solutions to complex problems and novel ideas.

Technical Skills

RDF, SHACL, SPARQL	●●●●●
Python	●●●●○
UML	●●●●○
Neo4j, GraphDB	●●●●●
JavaScript	●●○○○
ETL	●●●●○
XML, JSON	●●●●○
IFC, gbXML	●●●●●
Revit, Dynamo	●●●●○
EnergyPlus	●●●●●
Modelica	●●●○○

Languages

English	●●●●●
Greek	●●●●●
French	●●○○○

Awards

1st prize in Hackathon of LDAC 2022 Summer School at Cercedilla Spain
https://linkedbuildingdata.net/ldac2022/summerschool/

Interests

- Football
- Snowboarding
- Travelling

Professional Experience

Sep. 2020 - present
London, UK

Research Fellow
University College London

Research Fellow in Semantic Technologies for Digital Twins
- Designed and led the implementation of a scalable Data Lake and Building Analytics Platform architecture for EU's Horizon 2020 project "DigiBuild"
  - Providing technical guidance to the development of UCL's Marshgate Digital Twin pilot.
- Researching the intersection of Knowledge Graphs and LLMs for querying building data, using Langchain, ChromaDB, and OpenAI's API.

Marie-Curie Research Fellow in Cloud-BIM
- Extensive training in OpenBIM, Cloud and Semantic Technologies.
- Developed ETL tools, data quality checking mechanism and a logical inferencing engine to automate building data integrations using ifcopenshell, RDFlib and pySHACL python libraries.
- Created *SeeQ:* a Python library to facilitate development of portable applications
  - Presented work and collaborated with Siemens' AG R&D department at Zug, Switzerland.
- Presented research outputs in 5 different conferences.

Sep. 2022 - Jan. 2023
Golden, Colorado, USA

Computer Science Intern
Colorado School of Mines

- Collaborated with Dr. Gabe Fierro to devise a novel programming abstraction for portable smart building applications.
- Create and test a set of portable smart building applications based on Brick Schema.

Jan. 2020 - Jul. 2021
Atlanta, Georgia, USA

Research Assistant
Network Dynamics Lab (NDL), Georgia Tech

- Implemented time-series forecasting models and computer vision algorithms for the development of a Smart City Digital Twin prototype for the City of Columbus, Georgia.

Nov. 2017 - Aug. 2018
Athens, Greece

Software Developer
ACE-Hellas

- Collaborated with software engineers and supported the development of the Optimisation Computing Platform (OCP) to include Energy and CO2 emissions parameters.

Education

2020 - present
London, UK

PhD, Enabling Smart Building Operation at Scale
University College London (UCL)

- **Minor:** Knowledge Representation and Graph Databases
- **Research Topic:** Investigating scalable information modelling practices to facilitate data discovery and application development for large building portfolios.

2018 - 2019
London, UK

MSc, Smart Buildings and Digital Engineering
University College London (UCL),

- **1-year program** ("*Distinction*") with focus on Building Physics, Building Automation, Energy Management Systems, HVAC Control, Machine Learning
- **Thesis**: "Model Predictive Control for Buildings-to-Grid integration using dynamic electricity pricing"

2012 - 2017
Athens, Greece

MEng, Civil and Environmental Engineering
National Technical University of Athens (NTUA)

- **5-year program**: Applied Maths and Physics with focus on Computational Structural Optimisation and Sustainability
- **Thesis** (Excellent - Grade 10/10): "Environmental assessment of cost-optimised structural systems in tall buildings" - Published in Journal of Building Engineering