

Modeling:	<input type="checkbox"/>
Mathematics:	<input type="checkbox"/>
Programming:	<input type="checkbox"/>
Science:	<input type="checkbox"/>

Software Lab:

Git-based versioning for basic IFC change control

Description

Git is a crucial tool in the software industry as it forms the basis for code management in distributed teams. It is a robust solution that is tailored to the needs of source code management based on text files.

The design of a building has many similarities with software programming, as it faces similar challenges when it comes to organising the joint work of different domain experts who all contribute to a shared digital representation of the building (aka BIM). However, design work is not based on text files directly representing changes. Design data is stored and shared in structured formats like IFC being a graph-based structure that is derived via a complex export process from proprietary BIM authoring tools. The aim of this work is to find out whether the advantages of modern software development can be transferred to basic BIM data management, in particular to the control of design changes.

Task

The work should be focused on the needs of a single domain experts who wants to quickly identify relevant design changes that affects his own work.

Specific research questions to be answered by this work are:

- How to best extract and convert relevant data from an IFC model to text files being applicable in a Git-based version control system.
- How to best communicate diff-based file changes to the domain expert.
- How to integrate such solution in own design processes.

GENERAL INSTRUCTIONS:

- Understand IFC standards and its graph-based nature of representing design data
- Understand the idea of Git-based software development and code management (versioning and diffs)
- Use IfcOpenShell and Python programming language to extract relevant data from IFC models and convert it to text files (initial script to create CSV are already available)
- Use Python programming language to evaluate Git-change logs and to communicate changes to the domain expert

Supervisor

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