IBPSA Project 1

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Task 2: Building and City Quarter Models
WP 2.2: Building Information Modeling

Christoph van Treeck
Eric Fichter

IBPSA Project 1

Work Package 2.2 – Geometry Processing

Content	Method	Result
▪ **Space boundary** algorithms for model topology analysis and multi-scale simulation model generation ▪ **Update exchange** with Energy Plus	▪ **Review** of existing approaches, algorithms, codes and model checkers ▪ Evaluation of **best-in-class algorithms** for model-garbage analysis and processing ▪ Decision on **development path** and code re-use ▪ Development of **modular tools** for space boundary and model topology analysis	▪ Joint journal **publication** / review paper ▪ **GIT repository** with modular tools

Suggestions from the Coordination Meeting, 10 July 2018

Geometry

- Reading and **parsing IFC** and dealing with this information
- **Full access** to geometry and topology
- **Separation** of geology and topology as long as possible
- Creation of **connection graph** between objects
- **Manipulation** of geometry:
    - Reduction of level of detail and complexity
    - Finding relations between room and spaces based on topology only
- In the end discussing about **space boundaries**

Suggestions from the Coordination Meeting, 10 July 2018

General

- Investigation on **state of the art** (Annex 60, SBT, …)
- Testing libraries based on **IFC files**
- **Authoring tools** don't matter at this point
- Different **setup cases**, from easy to complex
- Constructing an example with **all building related entities** available in IFC
- **Sharable IFC-examples** stored in Git
- Creation of an open source **Sharable Environment** Team

Current Tasks

Today's Agenda

- **Team structure**, active developers

- Tools and software **development environment** for model parsing, visualization and analysis

- **Consensus** on overall process of geometry reading and processing, BRep transformation, decomposition and space boundary generation

Current Tasks

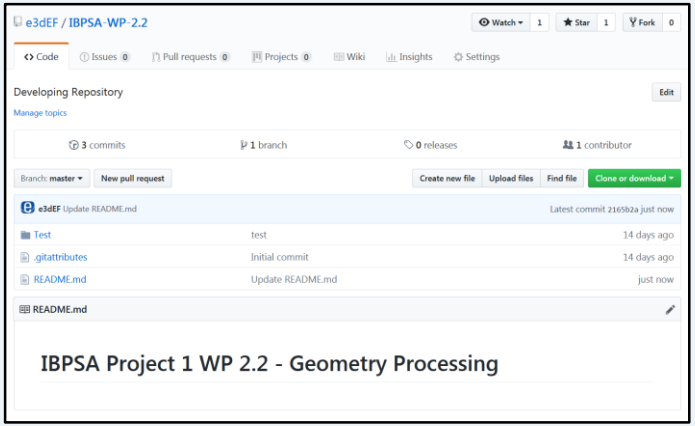
Open Source Sharable Environment Team

- E. Fichter **(RWTH Aachen)**
- C. Waluga **(LiNear)**
- J. O'Donnell **(University College Dublin)**
- J. Lin **(Tsinghua University)**
- G. Giannakis **(Technical University of Crete)**
- V. Bazjanac **(Stanford University)**

Current Tasks

Open Source Sharable Environment Team

- E-Mail Distribution List
- Git Repository IBPSA-WP-2.2
  (Contact Eric Fichter)



Current Tasks

Testing Team

- K.-H. Häfele **(Karlsruhe Institute of Technology)**
- Whoever wants to join …

To Do

Everyone

- Review of space boundary algorithms
- Summary of algorithms in a joint publication
- Conditions within the BIM to SIM workflow (level of detail, objects of interest, design requirements for IFC, etc.)

To Do

Open Source Sharable Environment Team

- Define the working environment
- Setup the working environment
- Testing basic geometrical and topological explorer algorithms

Testing Team

- Providing an IFC example file with all available entities
- Providing further IFC examples from easy to complex