Summer term 2019

**IDP: Software development to illustrate climatic parameters (Elements, e.g. solar radiation, temperature, and factors, e.g. latitude) and how these affect building physics***

* Scope and tasks can be adjusted accordingly

**Context – Relevance**

Climate-friendly construction and digitalisation are becoming increasingly important due to the advancing climate change and the associated public discussions. A dissertation on this topic has already resulted in a planning tool for architects based on MatLab (Dr. Petra Liedl, Interaction Climate-Man-Buildings: development of the interactive planning tools ClimateTool and FacadeTool and a building climatology-related climate classification; [http://www.climate-tool.com/en/home.html](http://www.climate-tool.com/en/home.html)). However, this tool has not been updated since 2016 and only deals to a limited extent with building physics.

**Interest in knowledge – Definition of objectives – Type of work**

The aim of this IDP is to program a similar tool with a user interface in order to use it in various courses and develop it further if necessary. Important is the relation to building physics and its topics.

For this purpose are to implement:

- Simple 3D building geometries and orientation
- Calculations of sun position and radiation intensity on surfaces (inclined and planar)
- Consideration of material differences and degrees of reflection in buildings
- Processing of weather and climate data from various sources
Methodology – Work packages

The task of this project is to program a methodology in MatLab that recognizes building physical and climatic correlations and presents them clearly in a GUI. The focus of this software should be on previously agreed climate elements and factors. The IDP takes place at the Chair of Building Physics with a workplace and regular supervision.

Work packages include:

- Development of the calculation algorithm
- Integrate databases
- Define data input format → Climate data interface
- Implement required key data of the building geometry
- User interface with data output option in various formats
- GUI with data visualization

Prerequisites – Requirements

- MatLab
- SQL

are desirable, but not absolutely necessary.

 Supervision – Contact

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