WUFI® Passive Plug-In Development Intern

The Fraunhofer Institute of Building Physics (IBP) is seeking a talented individual to develop and implement a plug-in for data exchange between Autodesk® Revit® and the building simulation software WUFI® Passive.

The position will work with, report to, and be supervised by the Department of Hygrothermics at Fraunhofer IBP, an Institute of the Fraunhofer-Gesellschaft in Germany, but will be located at the office of Passive House Institute US (PHIUS) in Chicago, IL. The position is unpaid and offers the ideal opportunity for a student to participate in an interesting research project and build upon existing abilities to develop new expertise.

About Fraunhofer IBP:

Fraunhofer is Europe’s largest application-oriented research organization. Our research efforts are geared entirely to people’s needs: health, security, communication, energy, and the environment. As a result, the work undertaken by our researchers and developers has a significant impact on people’s lives. We are creative. We shape technology. We design products. We improve methods and techniques. We open up new vistas.

The primary focus of the Fraunhofer IBP’s work is on research, development, testing, demonstration, and consulting in the various specialist areas of building physics. These include areas such as noise control and sound insulation measures in buildings, the optimization of acoustics in indoor spaces, and solutions for improving energy efficiency and optimizing lighting technology. They also include issues related to climate control and the indoor environment, hygiene and health protection, building material emissions, weatherproofing, and protection against heat and moisture, preservation of building structures, and the conservation of historical monuments.

The Department of Hygrothermics at Fraunhofer IBP is specialized in analyzing the dynamic heat and moisture behavior of building materials and components and whole building complexes. This includes analyzing the energy and moisture behavior of ventilation and air-conditioning systems and their interaction with the building envelope and other hygrothermal storage capacities. Such analyses form the basis for optimized systems technology that is adapted to the planned function of a building.
Position Background:

Building information modeling software platforms like Autodesk® Revit® are intended to design and document a building with a three-dimensional model of the building geometry and structure in addition to non-geometric detail information. A substantial amount of information about the building is generated with this software during the design process. The degree of detail may vary for some designed building models depending upon different requirements in the building design process. Building simulation modeling tools such as WUFI® Passive also require at least a three-dimensional geometry model (often more simplified than for Revit) in addition to information about the building materials, design conditions, and operation. Revit supports the import/export of such models, sometimes called energy analytical models, via the standardized gbXML file format.

The aim of this study is to investigate the models designed with building information modeling software, especially the import/export methods and the plug-in development for Revit. This study will explore the capability of exportable information and the relation between the output information from Revit and the required input information for WUFI Passive. The interaction and details of the exchange of building information between Revit and WUFI Passive will be investigated.

The selected applicant will be expected to develop a plug-in to export and convert the building information model, e.g. the geometry information defined with polygons and vertices, from Revit to WUFI Passive. A consistency check for the model’s dimensions, boundary conditions of building components, material parameters, and other non-dimensional building parameters, also needs to be developed and implemented. The plug-in should also be able to reverse the process and allow for the transfer of simulation results, and potentially even edited building information resulting from the dynamic building simulation in WUFI Passive, back into the building information model in Revit.

Position Tasks:

- Investigate the model notation and information of exportable energy analytical models by the building information software (Autodesk® Revit®) and compare it with necessary information for the building simulation tool (WUFI® Passive).
- Create a plug-in and guidelines for the building information modeling software Autodesk® Revit® (using Revit .NET API and C#), exchanging the building models with the passive house verification and hygrothermal simulation tool WUFI® Passive, with consideration of the standardized energy analytical model (gbXML) import/export.
- Evaluate the definition and relation of given building information and capability of information compared to the required building model and parameterization (building model consistence check), for a user-friendly plug-in and low susceptibility to errors.
What We Expect from You:

- Experience with C#
- Experience with XML
- Prior experience with building simulation software desirable
- Dedicated, systematic, independent, and self-sufficient work approach

What You Can Expect From Us:

- Excellent support from scientists at Fraunhofer IBP
- Gain experience with hygrothermal building simulation
- Friendly and flexible work environment
- Opportunity to participate in an interesting research project and to build upon existing abilities to develop new expertise

To Apply:

Please email certification@passivehouse.us with your resume and cover letter (.doc .docx .pdf) outlining how you meet the specific requirements of the position. Applications submitted without a resume or cover letter will not be considered.

No phone calls, please. Due to the volume of applications received we are not able to respond to every inquiry. We will only be following up with serious applicants who meet our requirements and have submitted the requested information.

The Fraunhofer-Gesellschaft is an Equal Opportunity Employer (EEO).

For a complete list of job opportunities available at PHIUS, visit www.phius.org/about-phius/jobs.

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