Artificial Intelligence for an Enhanced As-Is BIM Energy Analysis

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Abstract

Facing the current pursuit for energy efficiency in the Construction industry, as well as the increase in Building Information Modelling (BIM) related practices, the present paper proposes a methodology to enhance the as-is BIM energy analysis (AIBEA) process, aiming to ease the energy retrofit of the existing building stock and allow for increased energy efficiency in the Construction industry.

The proposed methodology comprises the entire AIBEA process from contract formulation to building energy analysis, tackling several existing research problems such as: identification of contractual requirements and quality verification parameters for BIM energy analysis and the scan-to-BIM process; analysis of laser scanner parameters and its influence over the point cloud; optimal placement of laser scanner stations; artificial training of Artificial Intelligence (AI) algorithms; identification of construction materials in point clouds; among others.

Author Keywords. Enhanced as-is BIM energy analysis, Automated scan-to-BIM, Artificial Intelligence, Point cloud segmentation and classification, Data mapping and material recognition.