Rapid Energy audit Point-cloud Autonomous InfraRed Sensing (REPAIRS): building retrofit using 3D virtual reality

Overview

This project will develop a mapping and inspection tool to quantify energy loss in buildings. It combines infrared (IR) scans from an Unmanned Aerial Vehicle (UAV) with a point cloud technique to generate three-dimensional (3D) maps of structures of interest and locate areas of concern. The UAV acquires IR images and a high-definition virtual model of the building is generated. The 3D virtual model can be used to identify heat loss using machine-learning algorithms and inform future retrofits. The proposed approach will make workers more efficient with their time, saving money, while making building energy efficiency assessments more precise and much more widespread than they currently are today. The novel and cost-effective sensing platform provides user-friendly results that will advance the industry for improved building or citywide energy audits and subsequent repair or retrofit.

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