

Autonomous Roof Rover Inspection System

Status: Filled

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Sponsor(s):

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Project Description

SMT (Structure Monitoring Technology) Research Ltd. provides electronics and expertise for Building Envelope monitoring and leak detection. The systems consist of data acquisition

The implementation of the automated leak detection is proposed. A robot will move around the roof while performing the measurements that are usually performed by an operator. The end result of the robotic scanning will be a vector map based on magnitude and direction of the measurements with designated leak positions all over the roof.

Project details:

Project Main Objective(s):

1. Design the system on rugged and versatile platform. Robot must be able to operate in all weather conditions, handle obstacles and difficult terrain.
2. Devise an accurate geo-positioning technique. The required localization resolution is 10cm.
3. Develop intelligent navigation algorithm for traversing the roof surface.
4. Develop post processing algorithms for automatic detection of leak locations from the measured vector maps.

Skills to be developed/learned:

1. Control Systems required for robotic control and automation.
2. Mechatronic skills may be required to design the robot chassis and capabilities to work in the required environment.
3. Wireless communication, firmware programming, circuit design and PCB layout are required for designing and integrating a highly accurate geo-positioning mechanism.
4. Software Programming is one of the key components, as differential voltage readings from the robot need to be correlated with positional data and populated on a drawing, where algorithms will identify the cor

