Project Description for R&D Internship

Job Title: Internship on Building integrated photovoltaics (BIPV) – Module development & Testing

Project description: As Singapore accelerates its transition towards a low-carbon future, the integration of photovoltaic modules into building facades and elements—Building-Integrated Photovoltaics (BIPV)—is emerging as a critical solution for sustainable urban development. The Singapore Green Building Masterplan (SGBMP) and initiatives like the SolarNova Programme aim to green 80% of buildings and deploy at least 2GWp of solar energy by 2030, driving a shift towards innovative solar technologies. BIPV should not only maximize energy generation within Singapore's space-constrained environment but also enhance architectural aesthetics, aligning with the nation's vision of a greener, high-performance built environment.

In this internship, the student will work on novel BIPV modules including colored PV, Peranakan-inspired panels and PV Tiles that can display beautiful and aesthetic images and patterns while minimizing the optical losses incurred by solar cells. Interns will explore the space where art and engineering meet – designing beautiful solar panels for building cladding & facades while performing standard tests and monitoring.

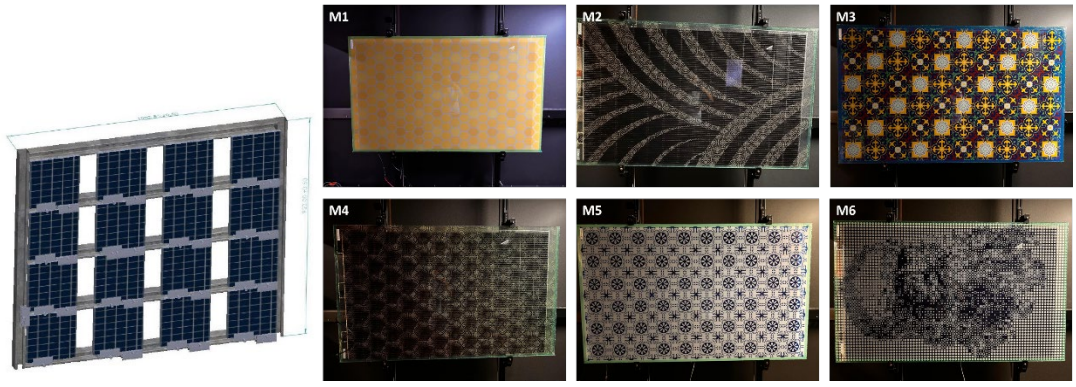

Figure 1 BIPV panel/system design (right) and characterization (left)

Job description: We are inviting currently enrolled bachelor's/master's students with a strong interest in hands-on research work. Students with a background in CAD Modeling, Rapid Prototyping, Mechatronics, Data collection & Visualization, are invited to join SERIS for a project of ~3-6months. We are looking for an intern to work on one or more of the following objectives:

1. Development of CAD Models and engineering drawings for photovoltaic modules and mounting structures. Fabrication through rapid

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prototyping and/or conventional methods, vendor sourcing and other processes required to develop new products in the domain of BIPV.
2. Monitoring & data collection of BIPV systems at indoor and outdoor environments using standard and specialized test protocols. Note that some physical exertion is expected, where solar panels weighing up to 50kgs will be handled during measurements and experiments.
3. Involvement in adhoc projects and tasks within the BIPV group. This may include BIPV module fabrication and measurements.

Competencies gained during internship program:

- Practical experience in studying and designing BIPV technology.
- Designing of experiments based on research objectives which are set by the intern.
- Team working & scientific communication skills.

Skill & requirements:

1. Currently enrolled in or has recently completed a diploma/bachelor/master's in in engineering.
2. Experience in one or more of the following: CAD Modelling, Rapid Prototyping, Fabrication, Soldering, Workshop Hand Tools, Solar Energy (basic level), Data collection & visualization.
3. A keen interest in performing and publishing research. We aim to publish at least an international conference paper with this work
4. Good English skills (oral and written) is needed. Should be able to produce reports and communicate progress effectively.

Interested applicants to kindly submit CV to Rupendra Aryal (rupendra@nus.edu.sg) and Dr Carlos Clement (carlos.clement@nus.edu.sg) for review. Internship will be located off-campus at Cleantech One.

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