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## **MECH 493 project: Three-Colour Pyrometry for Temperature and Emissivity Measurement**

### **Background and research goal**

Multi-colour pyrometry can be used to evaluate the temperature and properties of a radiating surface or media, without prior knowledge of the emissivity. In this project the extension of the commonly used two-colour method will be explored by including a third wavelength. In particular, any improvements in the temperature and emissivity calculation will be assessed. Furthermore, possibilities for characterizing signal quality using the additional spectral information will be evaluated, with a particular focus on identifying calibration drift and/or sensor fouling.

### **Tasks to be performed by the student**

For these activities, an existing multi-colour probe will be used to consider simple (benchttop) flames as well as combustion in an operating engine. The student is expected to plan and execute the required experimental campaigns, as well as further develop and implement an existing post-processing algorithm.

### **Facilities and team:**

This project will be carried out in the Clean Energy Research Center. The student will be supervised and trained by Dr. Kirchen and a senior PhD student, but is expected to perform tasks independently and safely in the laboratory.