

**ME 600 Seminar**

**Justin Lajoie and Jiaqiong Li**

**October 19 at 11:00 am in 2004 Black**

Justin Lajoie: 3D Printing of AP Composite Rocket Propellant

Abstract 3D printing has become a promising alternative to traditional manufacturing techniques but inadequate implementation exists in AP composite rocket propellant grains. This presentation will review previous work on this topic. Current work will be discussed on the topic to include 3D printer design and binder formulation. Future research possibilities created by 3D printing will be discussed.

Jiaqiong Li: 4D Line-Scan Hyperspectral Imaging

The proposed 4D line-scan hyperspectral imager combines 3D geometrical measurement and spectral detection with high spectral resolution and spatial accuracy. We investigated the geometrical optical model of a camera attaching with a spectrograph, theoretically explored the mathematical model for line-scan fringe projection profilometry and established the 3D reconstruction and calibration methods under this proposed line-scan high-dimensional imaging system. The spectral resolution of the system is 2.8 nm, and the spatial root-mean square-error is 0.0895 mm when measuring a standard sphere with a diameter of 40.234 mm. We measure a colored statue to showcase the intensity change along the dimension of wavelength. In addition, the quality and defect of spinach leaves are inspected based on spectral data and depth data, which demonstrates the potential application of the system in the food industry.

***This seminar counts towards the ME 600 seminar requirement for Mechanical Engineering graduate students.***

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