

# EEL4511 Real-time DSP Applications

## Lab 9 Final Project

### Title: **Frequency Controlled Light Bar**

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#### Abstract:

This project consists of connecting a MLS3519 (2) meter LED bar to the DSP. A FFT is then applied to incoming sound to break it up into three distinct energy bands (lo, mid, hi) such that the LED bar visually dances to different types of music.

#### Features:

1. DSP McBSP interface to the MLS3519 IC.
2. 1024 point FFT,  $F_s = 36\text{K Hz}$  with  $36\text{K}/1024$  bin resolution.
3. Machine learning Trosky Algorithm applied to the energy in ranges 100-500 Hz, 500-1500 Hz and 1500 – 5000 Hz such that “dancing” appears on the LED bar in sync with the musical input.
4. Dual CPUs used. CPU1 => sampling & 5000 Hz LPF, CPU2 => FFT & Trosky Learning Algorithm

Grade: **< Leave blank and attach all code& schematics to this document.>**