

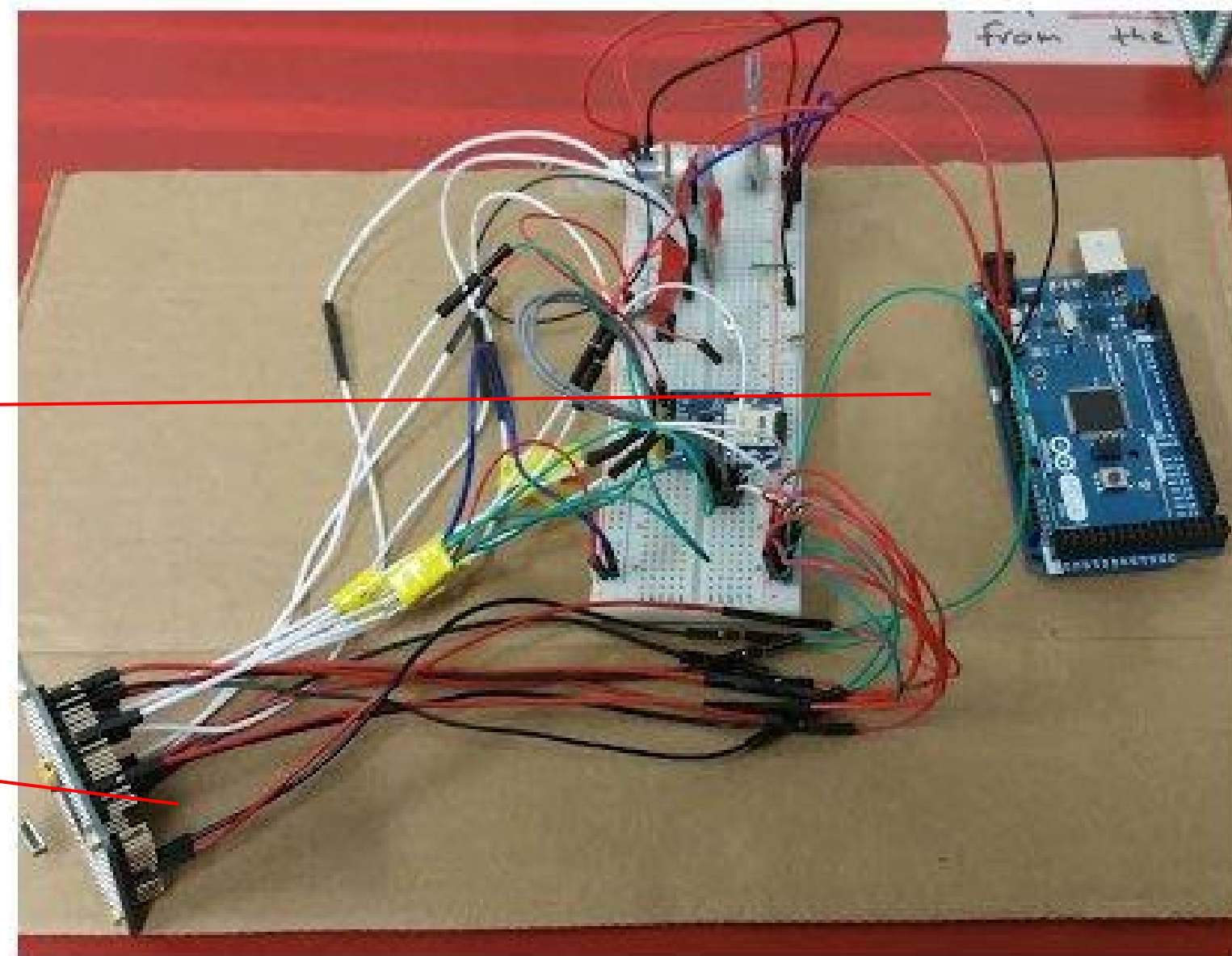
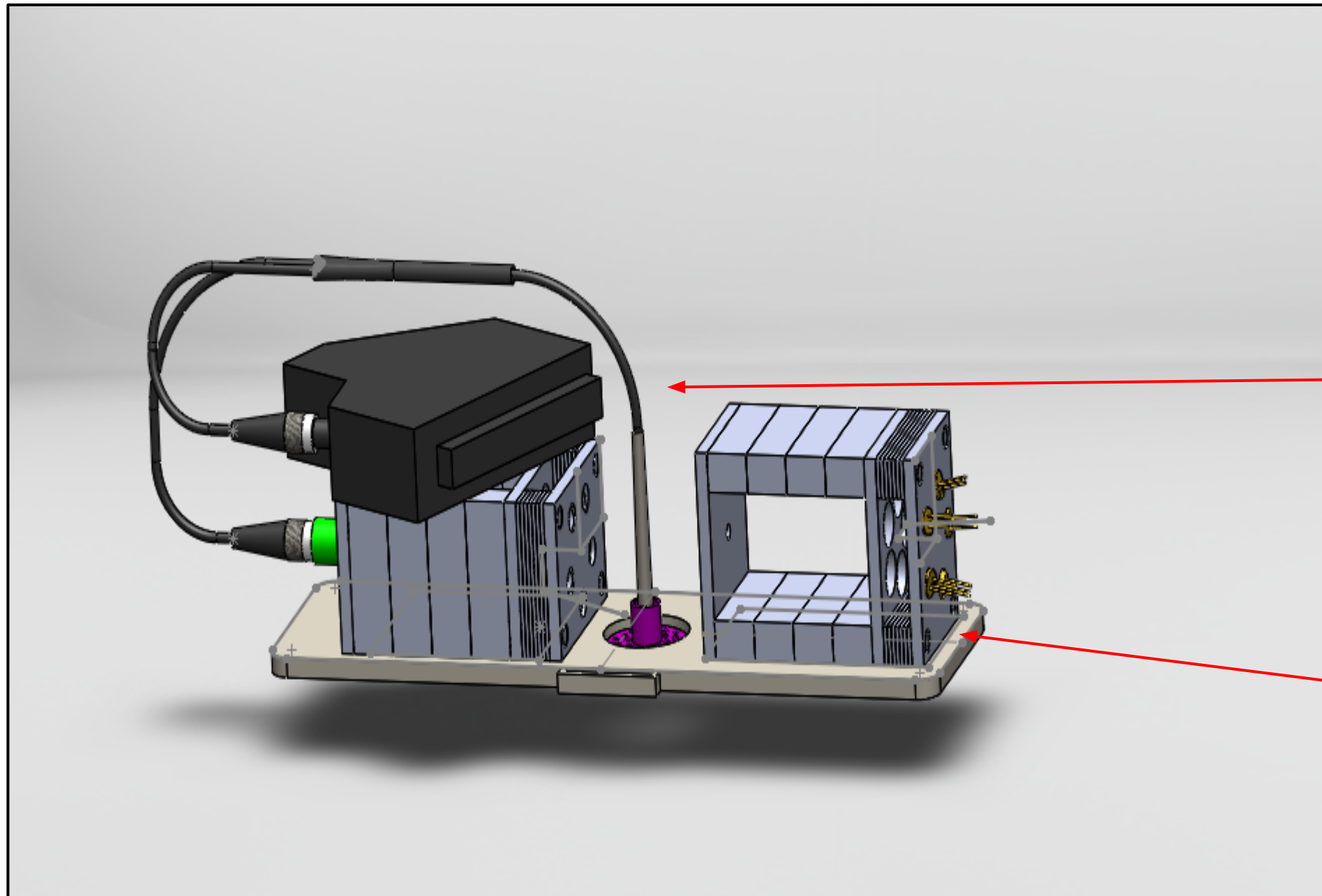
# Electro-Optical Design Engineering Team

Electro-Optical Design of security Spectroscopy Devices

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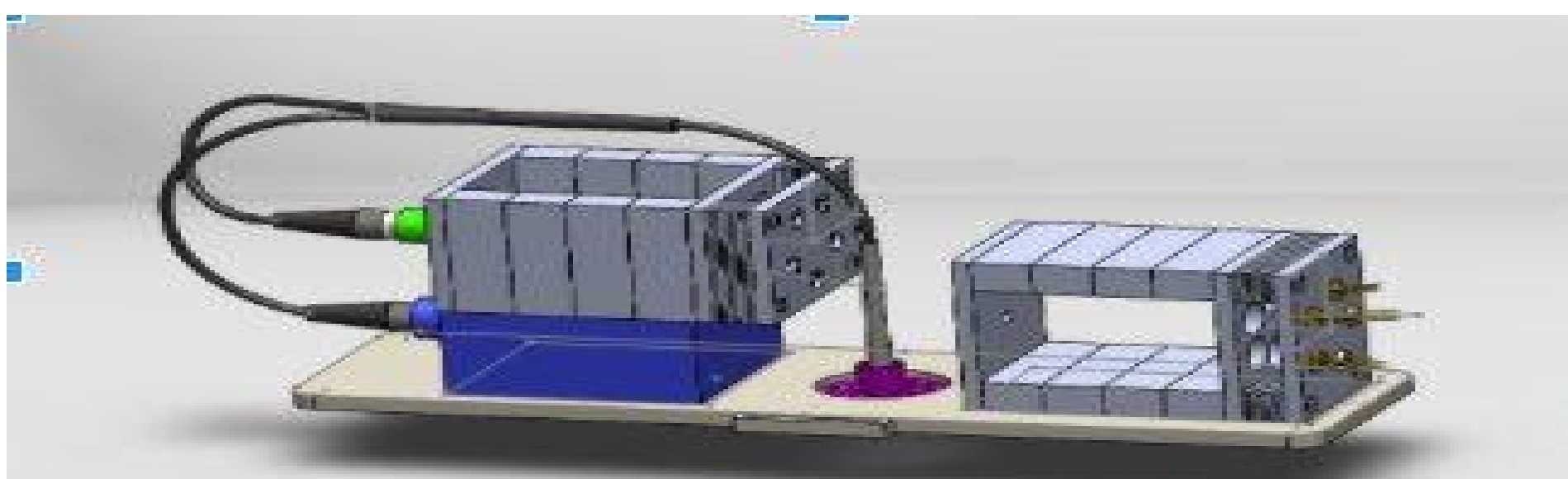
**Goal:** Spectroscopy is a growing field being used in many food applications for quality assurance and quality control. We will look at the ability to use Spectroscopy to create a compact spectrometer to be able to detect the presence of substances behind surfaces for security purposes. .

## Entire System overview:

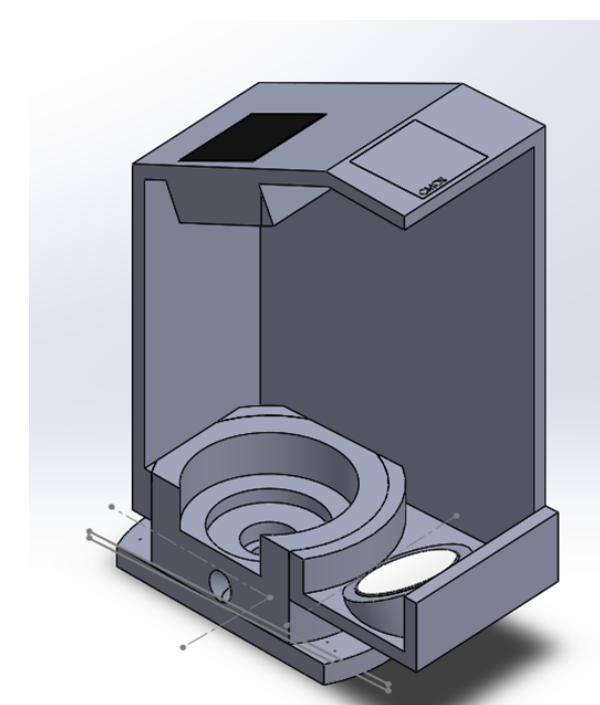


**Design Requirements** → Compact size for easy transportation for in-field analysis. Cheap components. High Sensitivity in the Visible Light Range. High Resolution of  $13\text{cm}^{-1}$  to  $30\text{cm}^{-1}$ . Capable of working with current industrial user instruments such as Tablets and Smart-phones.

**Old Designs:** Team has went through multiple designs with numerous different optical combinations. Below are 2 old designs who have failed our practical lab testing:



**Reason** → Lack of Optical Resolution  
**Change** → Changed Receiver unit



**Reason** → Lack of sensitivity and optical light collection  
**Change** → Optical Design/internal components

Sub-component(s): (Optical to the Left and Electrical to the right)

