Extending The Use of a Portable Spectrometer to Photoluminescence

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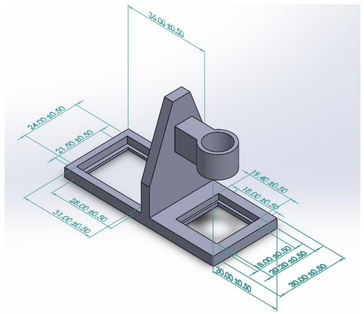
Research question

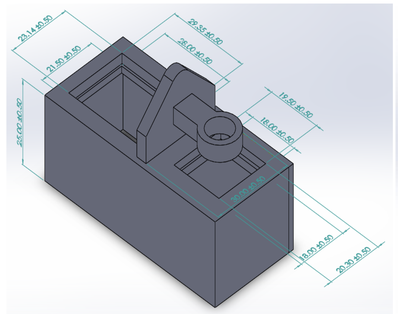
How can the detection of photoluminescence be incorporated into an inexpensive, portable UV/VIS/IR spectrometer?

Photoluminescence can be used to identify the nature of materials, including the identification of skin disease, including cancer, and detecting whether food is safe to eat or is spoilt.

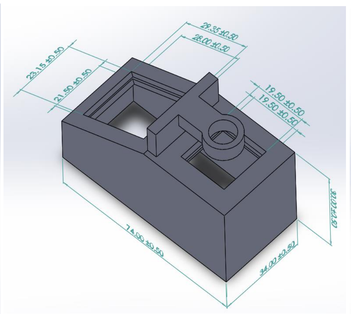
Progress



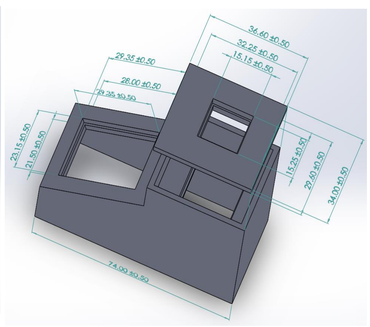
1st Model



2nd Model



3rd Model



4th Model

**All dimensions in mm*

Obstacles

- Limited movement to and from the lab due to COVID-19
- Identifying best clearance for 3D-printing fitting parts in Formlabs 3D printer
- Unexpected leakage of the excitation beam into the detector in the initial designs

Acknowledgements

Max Linnander - Program Manager, SciHub

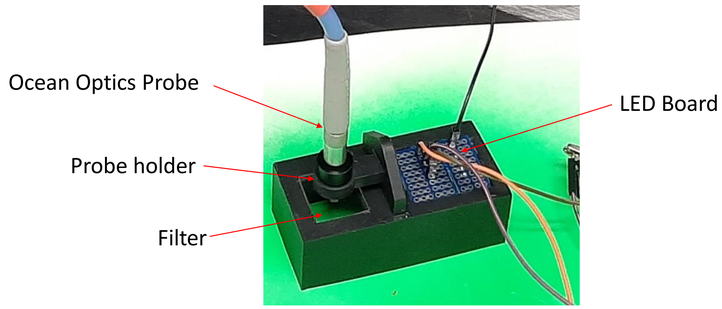
Approach

- Designing a device that uses an LED as a light source and a filter to eliminate any signals from the excitation beam from entering the detector
- Detecting the photoluminescence with the use of an Ocean Optics probe and subsequently a photodiode

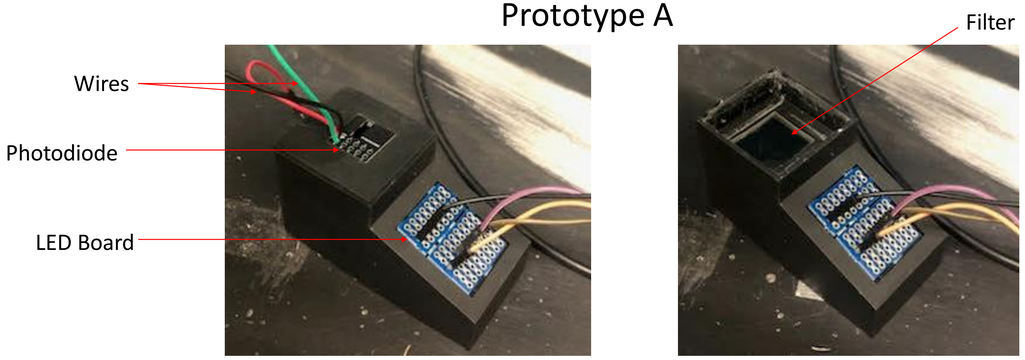
Prototypes

Two different proof-of-concepts were developed:

1. Prototype A: using an Ocean Optics spectrometer (functional)
2. Prototype B: using a photodiode (work-in-progress)



Prototype A



Prototype B

FURI

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