Prospector

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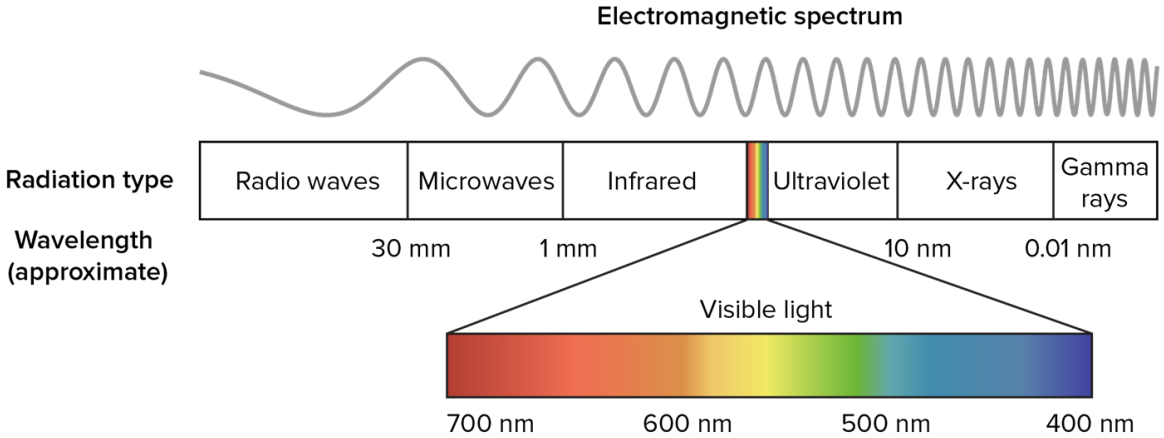
Computer Science

Motivation

- Develop an application which can run on the platform like Windows OS, Android phone or Raspberry Pi.
- Retrieve and analysis of raw data from the spectrometer device.
- Calculate the content of chemical compound like carotenoids inside plants like cassava, spinach, carrot, etc. by analyzing the wavelength model.
- Make it an affordable machine for the farmer and research scientists.

Wavelength

The **visible spectrum** is the only part of the electromagnetic spectrum that can be seen by the human eye. It includes electromagnetic radiation whose wavelength is between about 400 nm and 700 nm.[1]



[1] Light and photosynthetic pigments. https://www.khanacademy.org/science/biology/photosynthesis-in-plants/the-light-dependent-reactions-of-photosynthesis/a/light-and-photosynthetic-pigments

SCiO Spectrometer

- Bluetooth, Android/IOS App.
- Wavelength range: 700 - 1100 nm[2]
- Development Evaluation Toolkit available (Android Studio) in limited features.

[2] Testing the SCiO. https://scio2015.weblog.tudelft.nl/2015/10/23/at-the-faculty-of-chemical-and-physical-engineering/

SCiO Spectrometer - Demo

https://www.youtube.com/watch?v=0zzSbw_x8EU

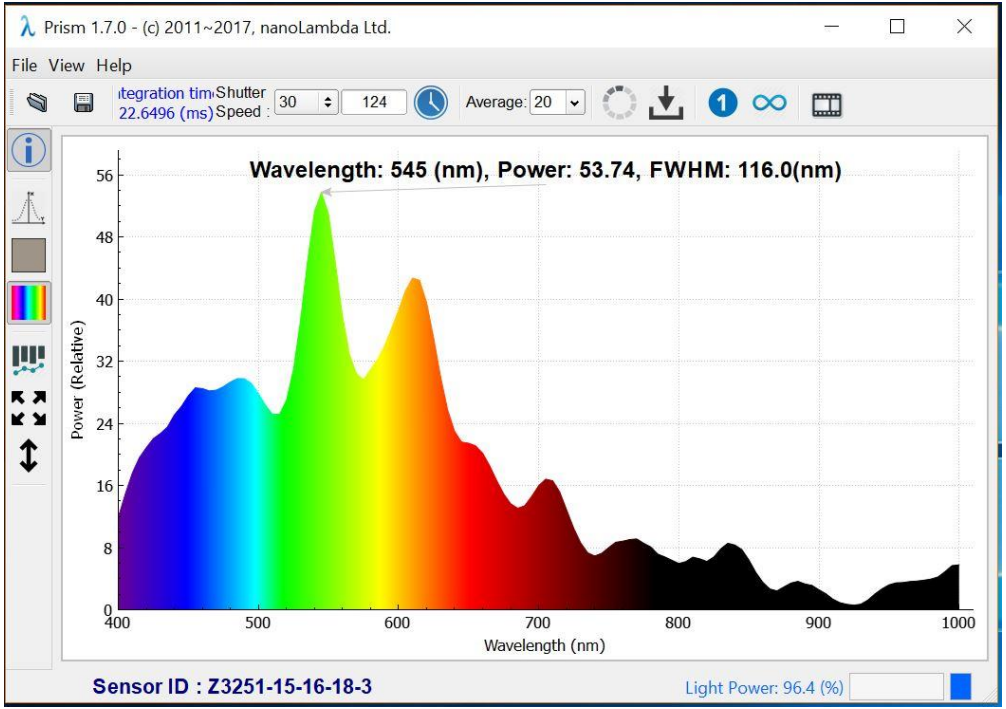
NanoLambda Spectrometer

- Wavelength range: 400 - 1000 nm (W1)
- NSP32 SDK was developed in the C/C++ environment.
- Support Android, Raspberry-Pi, Windows, Macintosh, and Linux operating systems by cross-compiled libraries of C/C++.[3]

[3] NanoLambda.https://nanolambda.myshopify.com/

NanoLambda Spectrometer - GUI

- Shutter Speed
- Wavelength
- Power
- FWHM

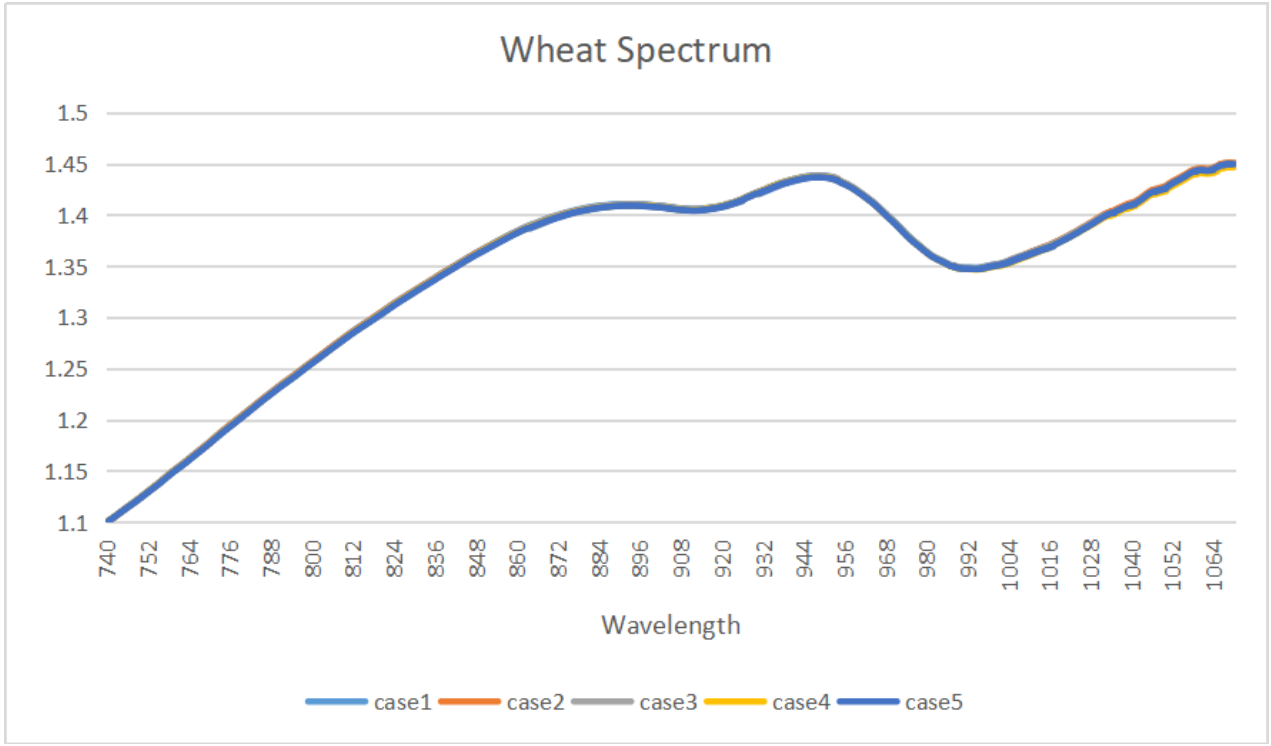


NanoLambda Spectrometer - Demo

https://www.youtube.com/watch?v=VsDOmqnS6og

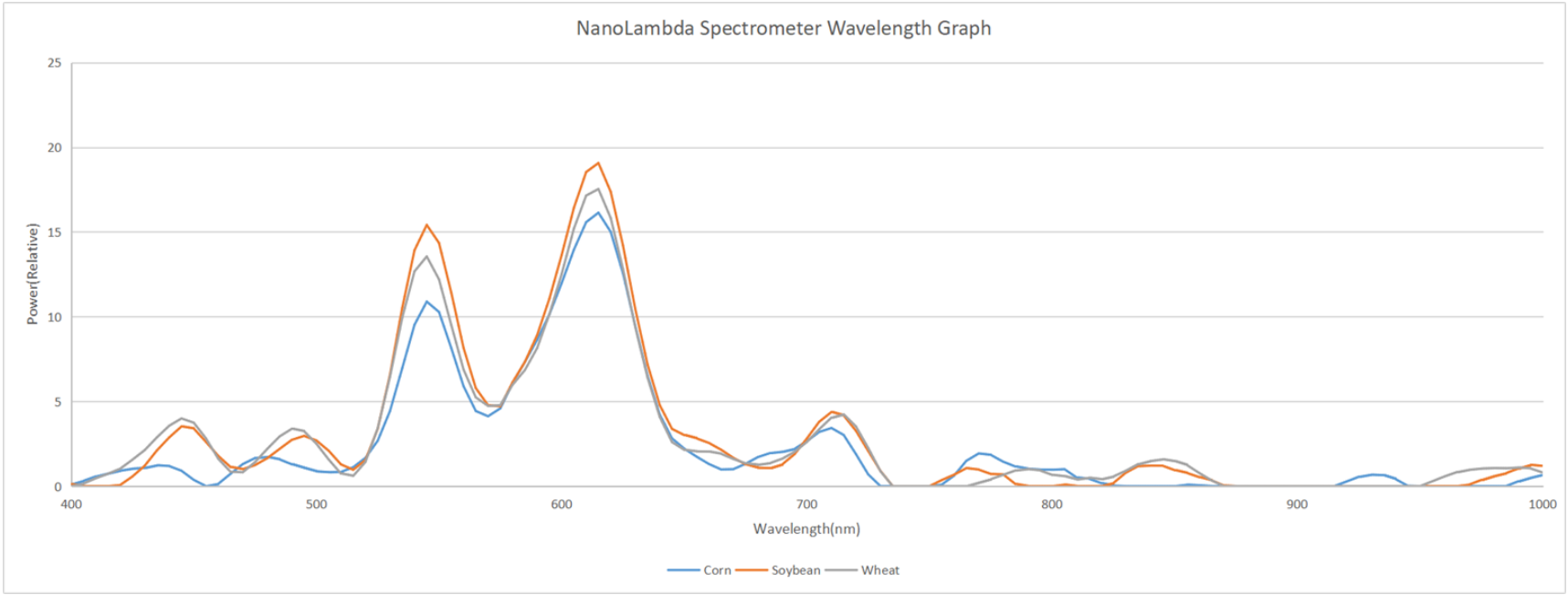
Spectrometer Result I

- Wheat sample
- Scan by SCiO Spectrometer
- Repeat 5 times



Spectrometer Result II

- Test on Corn, Soybean and Wheat.



Thanks for your attention, any questions?