



UNLOCKING HYPERSPPECTRAL REALITY

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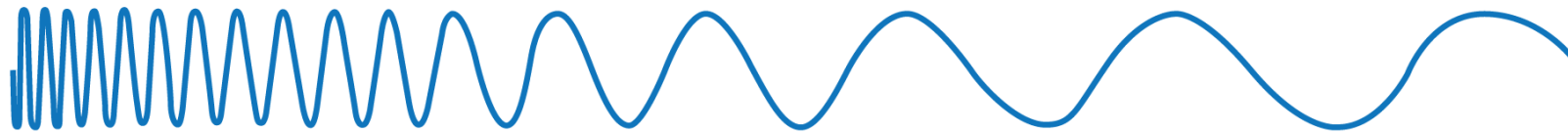


THE ELECTROMAGNETIC SPECTRUM

P e n e t r a t e E a r t h ' s A t m o s p h e r e



Radiation Type	Gamma Ray	X-ray	Ultraviolet	Visible	Infrared	Microwave	Radio
Wavelength (m)	10^{-12}	10^{-10}	10^{-8}	5×10^{-6}	10^{-5}	10^{-1}	10^3

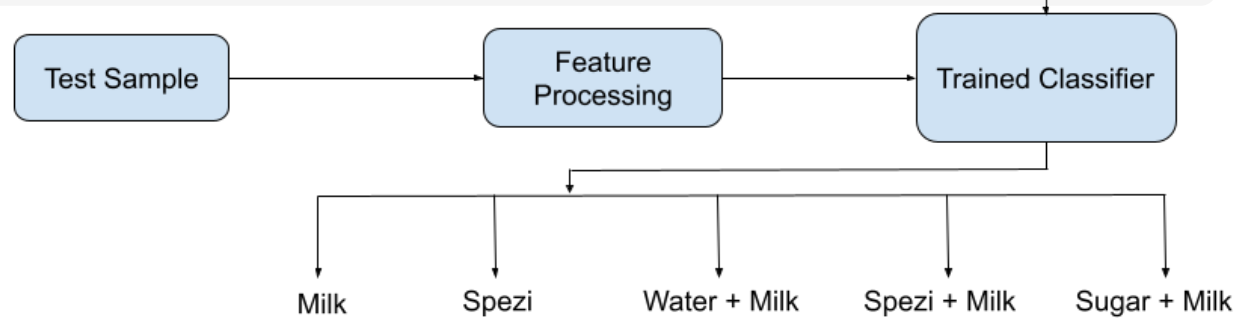
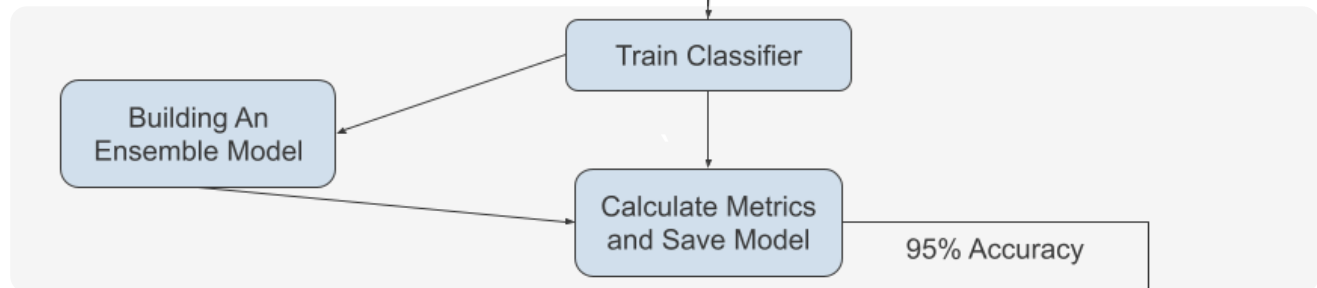
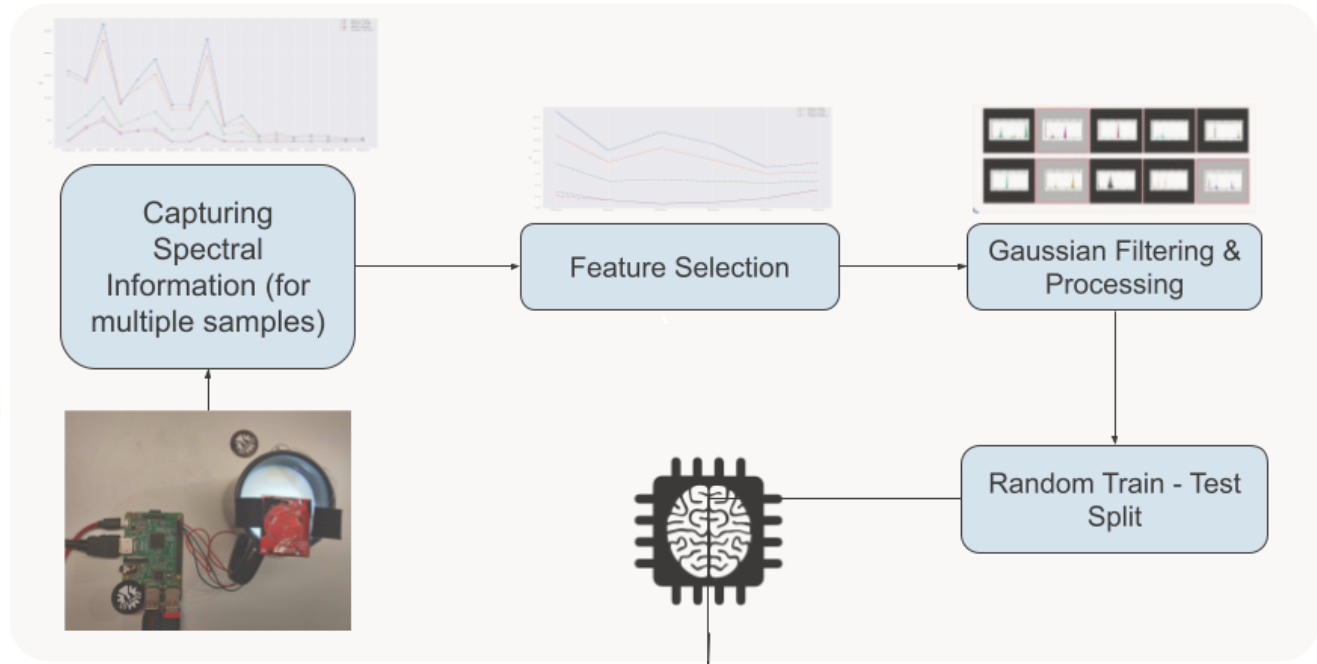


About the Size of Atomic Nuclei Atoms Molecules Protozoans Pinpoint Honey Bee Humans Buildings

Short wavelength
High energy
High frequency



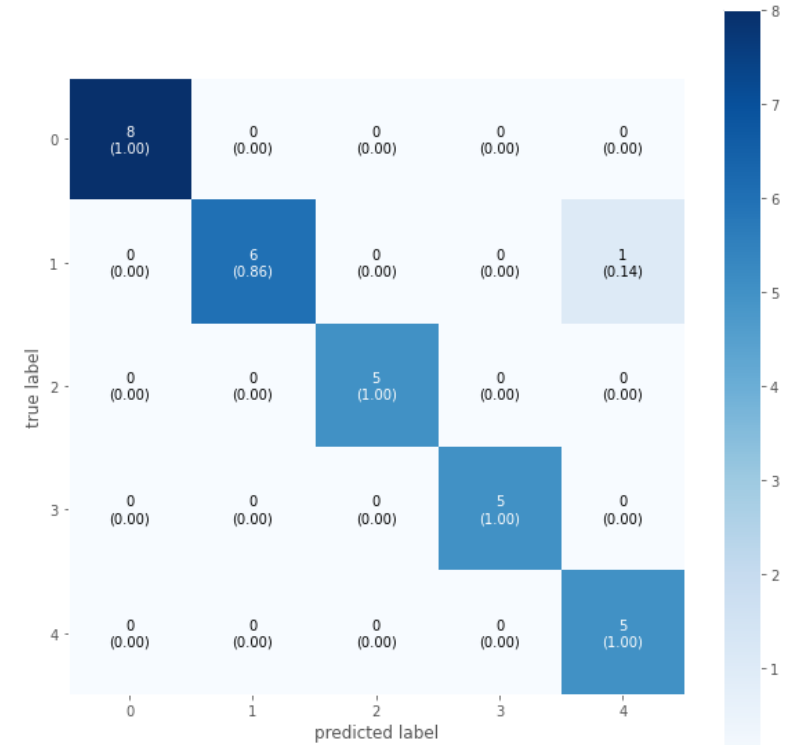
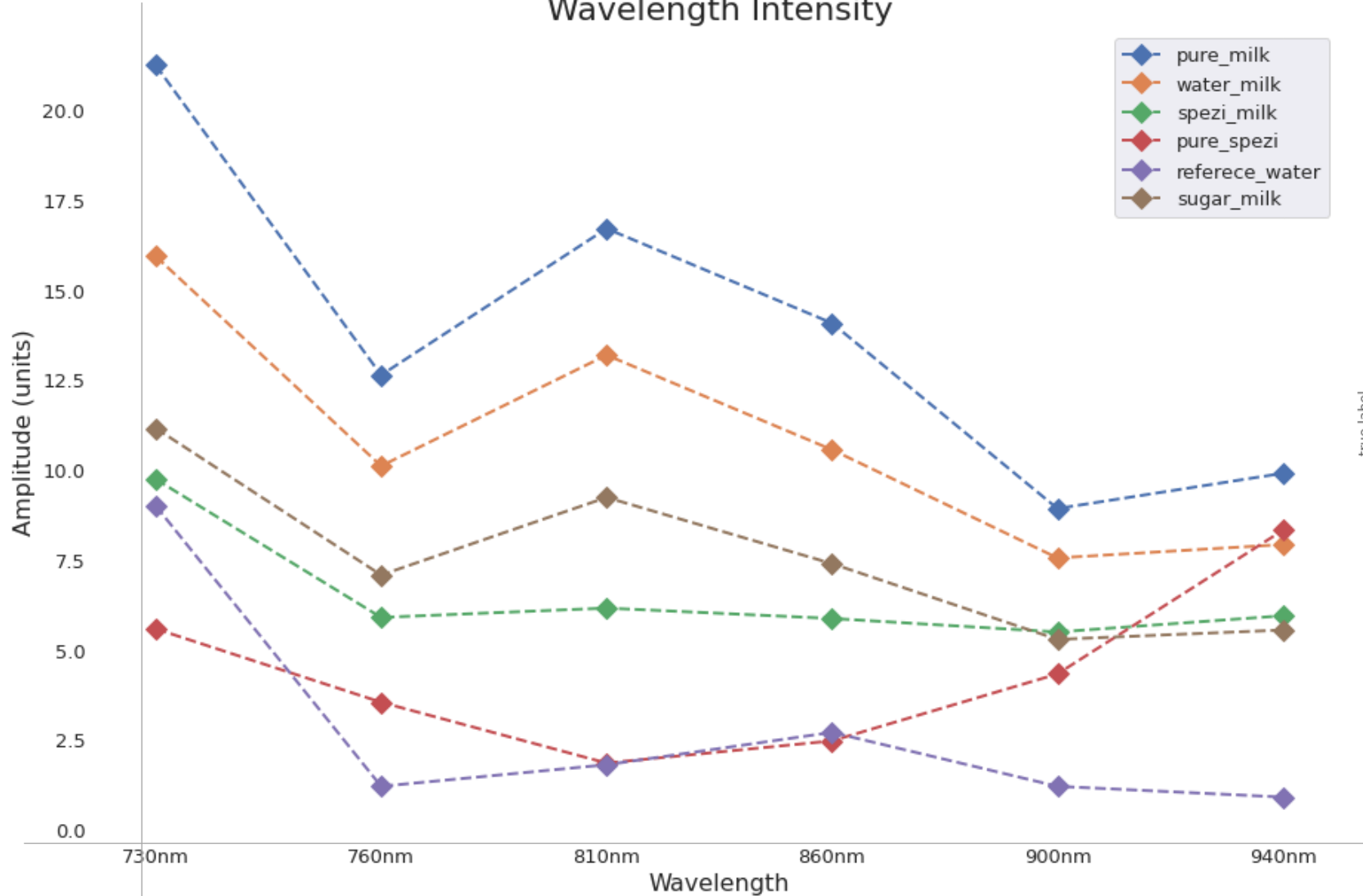
Long wavelength
Low energy
Low frequency



WHAT DID WE DO?

OUR EXPERIMENTS WITH THE TRUTH

Wavelength Intensity



DID YOU KNOW?

IN
2020

MICROPLASTIC
PARTICLES WERE
FOUND IN THE
**PLACENTAS OF
UNBORN BABIES**#

<https://www.theguardian.com/environment/2020/dec/22/microplastics-revealed-in-placentas-unborn-babies>

DID YOU KNOW?

80%

OF INGREDIENTS USED
IN PERSONAL CARE
PRODUCTS HAVE
**NEVER BEEN PUBLICLY
TESTED FOR SAFETY#**

<https://www.ewg.org/news-insights/statement/fda-warns-cosmetics-industry-follow-law-untested-ingredients>

DID YOU KNOW?

99%

IS THE SURVIVAL RATE
FOR MELANOMA (SKIN
CANCER) **WHEN
DETECTED EARLY**#

<https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2022/2022-cancer-facts-and-figures.pdf>

OUR PRODUCT VISION

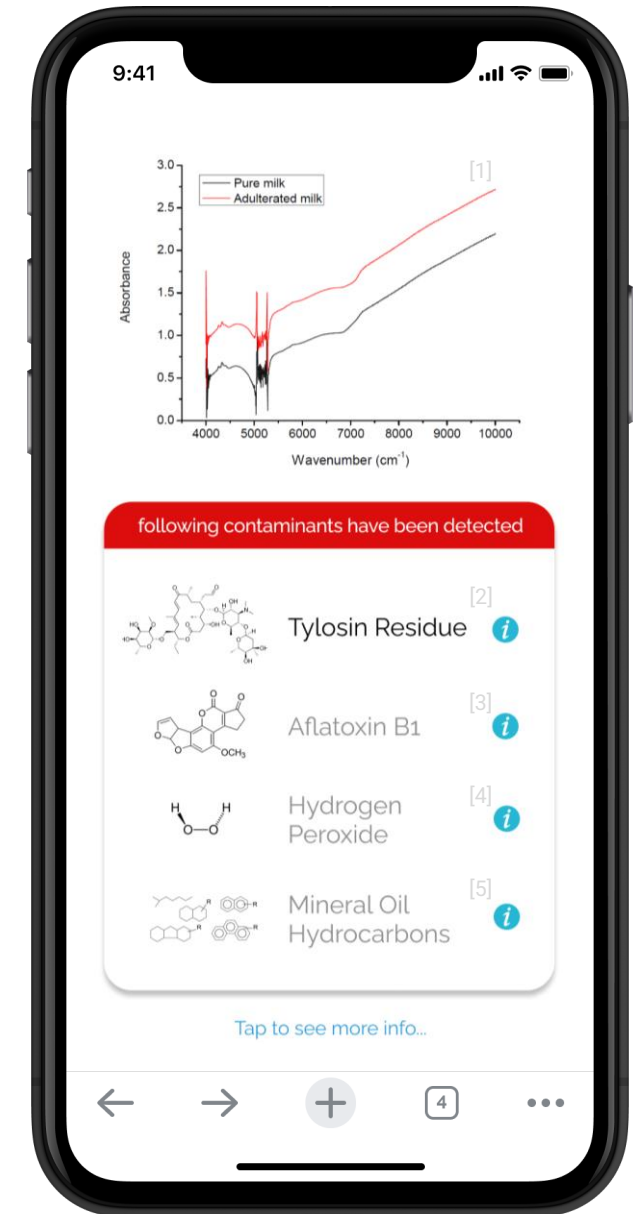
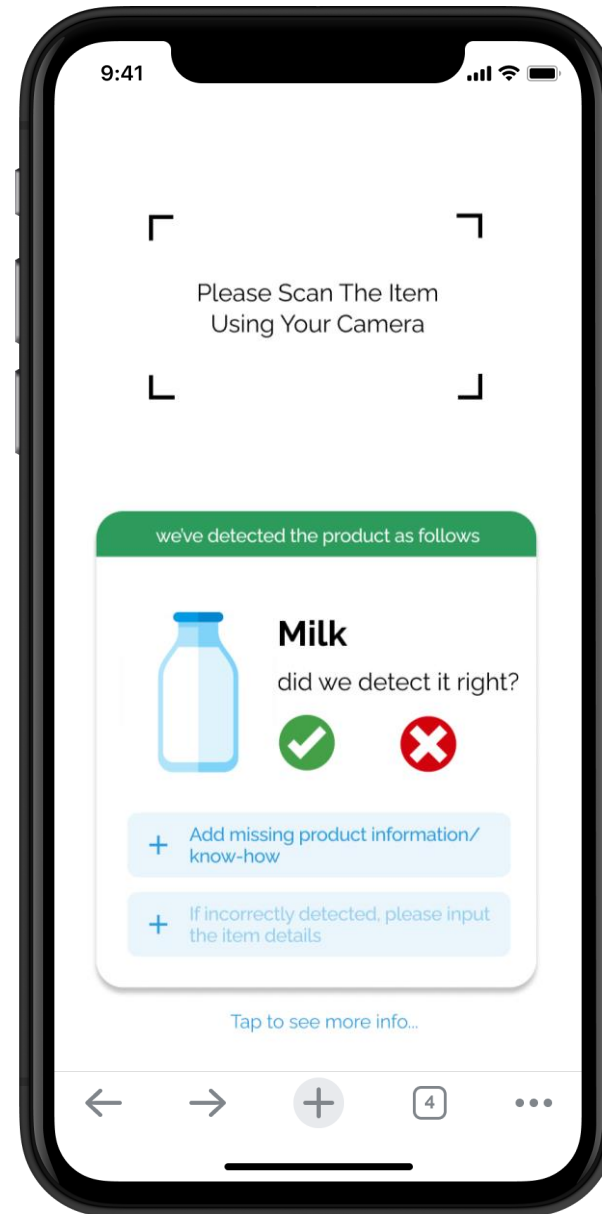


**HYPERSPECTRAL
CAMERA SENSOR**

POWER &
COMMUNICATION
ELECTRONICS

USER INTERFACE

NIFTY. INTUITIVE.



[1] Detection of Tetracycline in Milk using NIR Spectroscopy and Partial Least Squares, Wu et. al.

[2] [Infrared Spectroscopy Combined With Random Forest To Determine Tylosin Residues In Powdered Milk](#), Alexandre et. al.

[3] [Rapid Detection and Quantification of Aflatoxin B1 in Milk Using Fourier Transform Infrared Spectroscopy](#), Jha et. al.

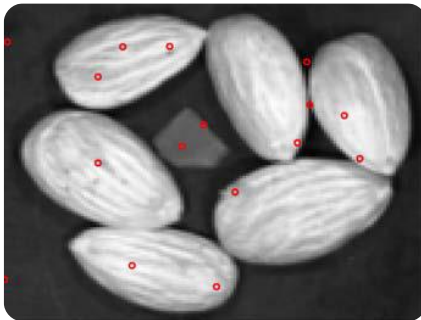
[4] [Milk Adulterant Detection: Conventional And Biosensor Based Approaches: A Review](#), Nagraik et. al.

[5] [Contribution Of Packaging Materials To MOSH And POSH Contamination Of Milk Powder Products During Storage](#), Wan et. al.

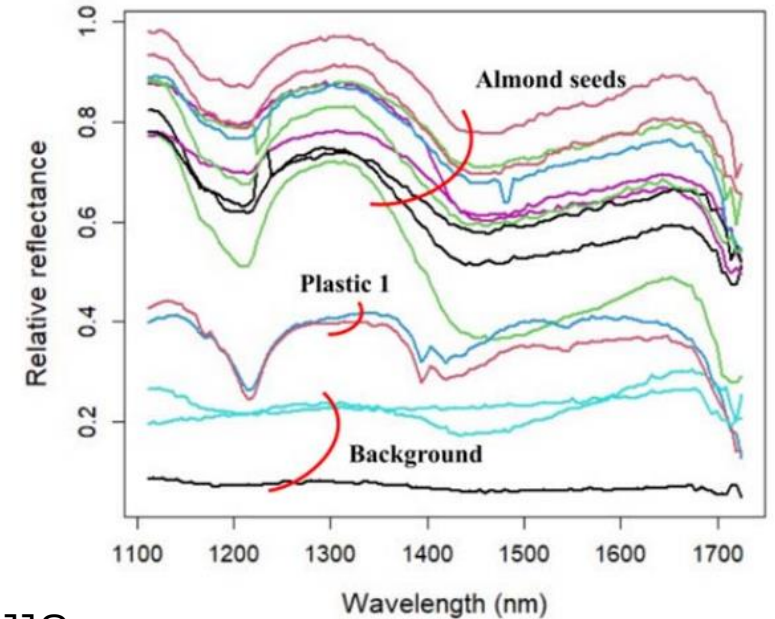
NUTRITION

microplastics are an emerging risk that is **not yet fully understood**

- Virtually all plastics absorb infrared (IR) light in a highly selective manner, making their infrared spectra a useful qualitative diagnostic
- The **real-time on-site** triage of microplastics (~ 1 mm – 5 mm) can prove to be a useful diagnostic tool



- Spectral Range: 900 nm to 1700 nm
- Pixel Resolution (using micro NIR): 135x118
- Detected Signatures:
 - 83% Almond
 - 16% Microplastics** [1]



[1] "Near-Infrared Hyperspectral Imaging Spectroscopy to Detect Microplastics and Pieces of Plastic in Almond Flour", H. Apaza et. al., International Journal of Computer and Systems Engineering, 2021, [URL](#)

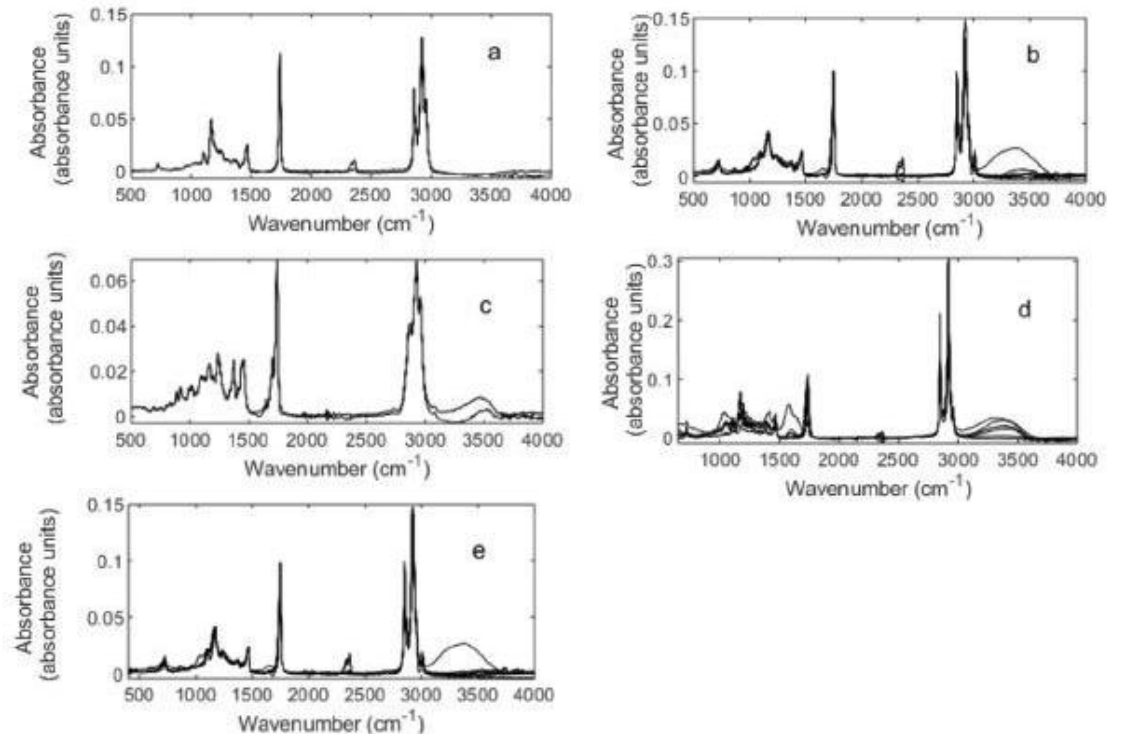
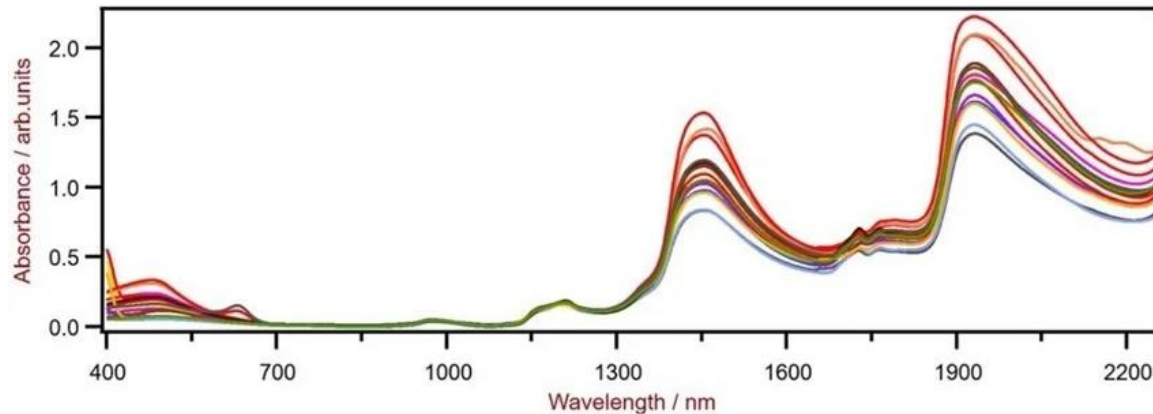
[2] "Identification And Quantification Of Microplastics In Table Sea Salts Using Micro-NIR Imaging Methods", Jixiong Zhang et. al., Anal. Methods, 2018, 10, 2881–2887 , DOI: 10.1039/c8ay00125a



SKINCARE

an average person uses **nine products a day** with **126 unique ingredients**

- Cosmetics aren't required to be extensively tested in many parts of the world [1]
- The spectra can facilitate **identification** of **harmful chemicals** and **skin allergens** [2][3]



[1] [How Cosmetics Are Not FDA Approved](#)

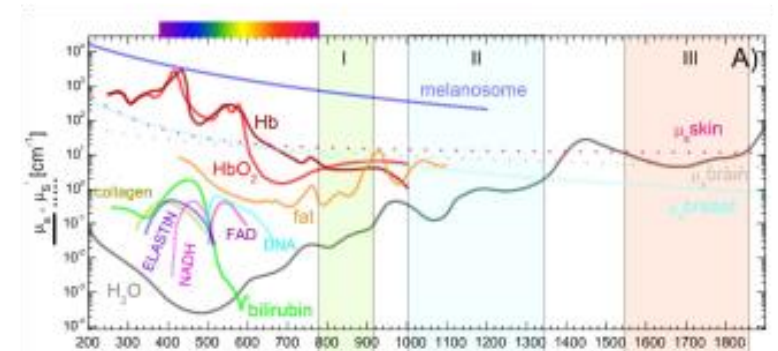
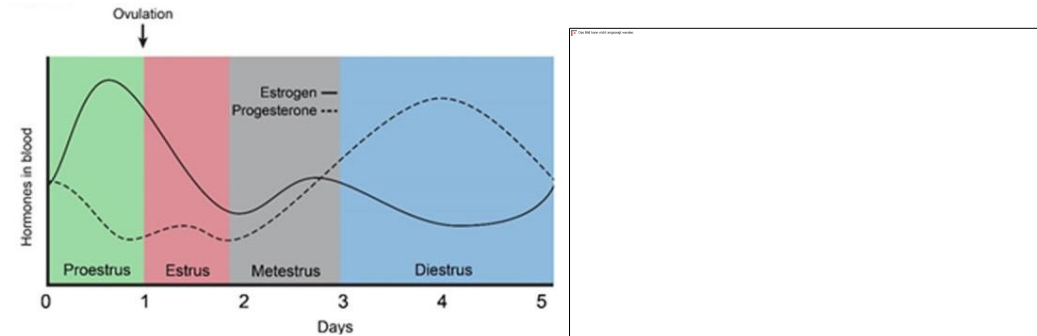
[2] [Hyperspectral Analysis Of Moisturizing Creams](#)

[3] [Evaluation-of-Fourier-Transform-Infrared-Spectroscopy-for-Analysis-of-Cosmetics](#)

HEALTH

significant reduction of costs and improved performance in disease management and prediction

- Ovulation Monitoring
 - the average cost of ovulation monitoring device is 100 EUR
- Pregnancy Test
 - at your comfort, anytime!
- Breast/Prostate Cancer Detection
 - don't worry, we'll tell you everything in time!



[1] "Diagnosing Pregnancy Status Using Infrared Spectra", unipd.it, 2022. Available: [URL](#)
[2] "Advances In Thermal Image Analysis For The Detection Of Pregnancy Using Infrared Thermography.", [URL](#), 2022.
[3] "Early Pregnancy Diagnosis: A Non-Invasive Approach Using VIS-NIR Spatially Resolved Spectroscopy.", [URL](#), 2022. .
[4] "The Use Of Infrared Technology As A Novel Approach For Studies With Female Animals" [URL](#)
[5] Liu, T-M., et. Al., Smart NIR linear and Nonlinear Optical Nanomaterials For Cancer Theranostics: Prospects In Photomedicine, Progress in Materials Science (2017), [doi](#)



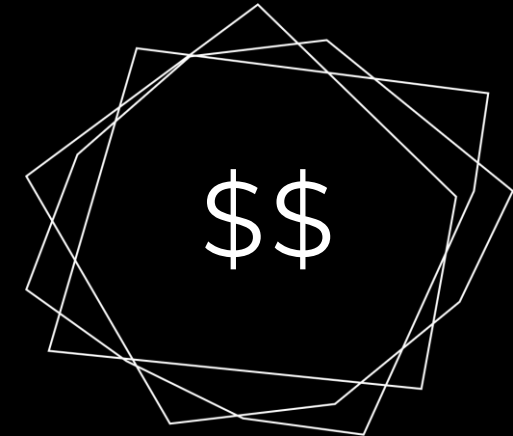
BUSINESS OVERVIEW



GLOBAL SPECTROSCOPY
MARKET

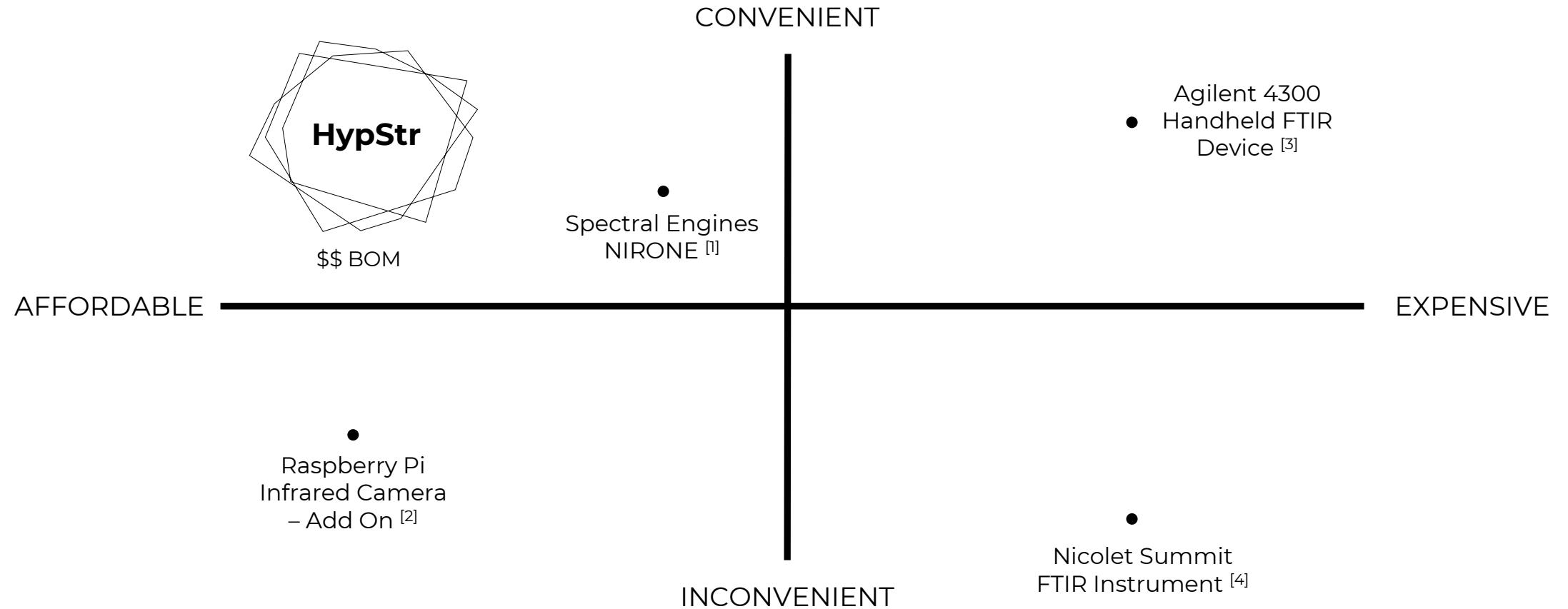


OPPORTUNITY TO
BUILD



TIGHTLY REGULATED
key opportunity for integrated
solutions?

QUALITATIVE POSITIONING



[1] <https://www.spectralengines.com/products/nirone-sensors>
[2] <https://www.raspberrypi.com/products/pi-noir-camera-v2/>
[3] www.agilent.com/cs/library/applications/5991-6976EN.pdf
[4] <https://www.thermofisher.com/order/catalog/product/912A097>

WE'RE

TEAM HypStr

consisting of



physicist



neuro
engineer



electrical
engineer



moral
supporter



THANK YOU