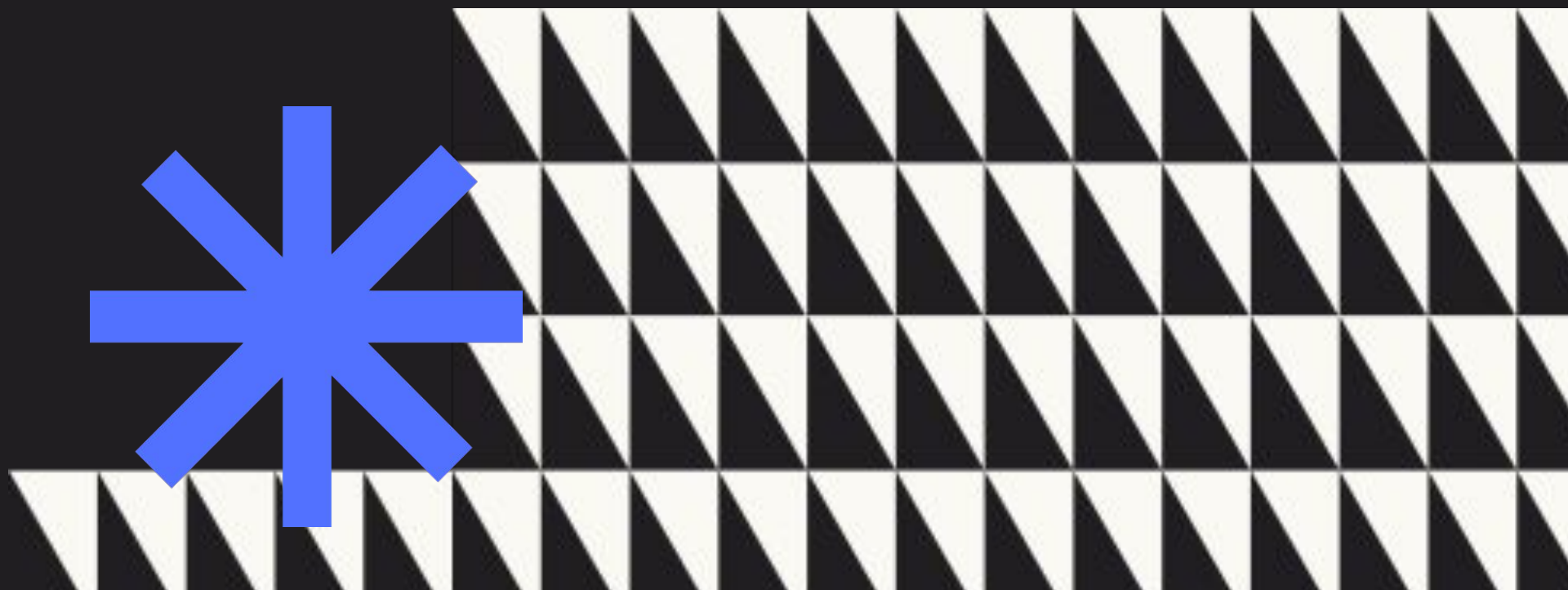
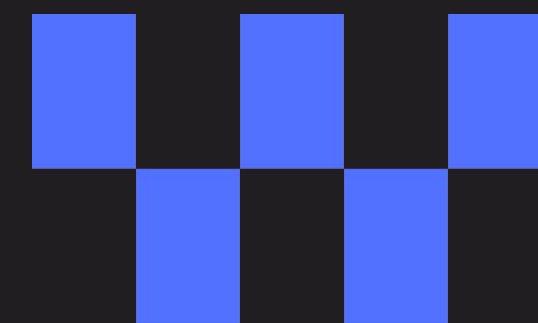


LSTM CLASSIFICATION OF 6 PLASTICS FROM FOURIER-TRANSFORM INFRARED (FTIR) SPECTRA

AI
DEEP
LEARNING
PROJECT

BY
RICKY
ROBINSON
BOCEK

https://github.com/bocekout/LSTM_Classification_of_6_Plastics_From_FTIR_Spectra



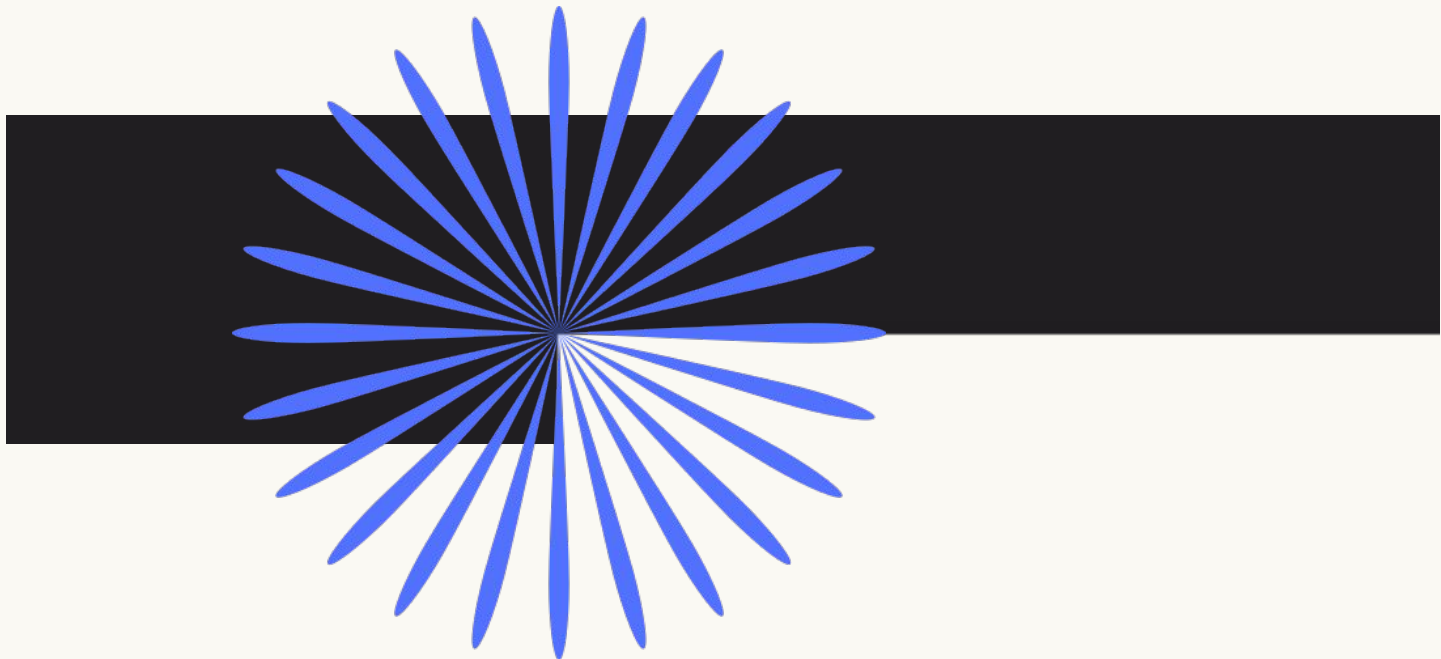


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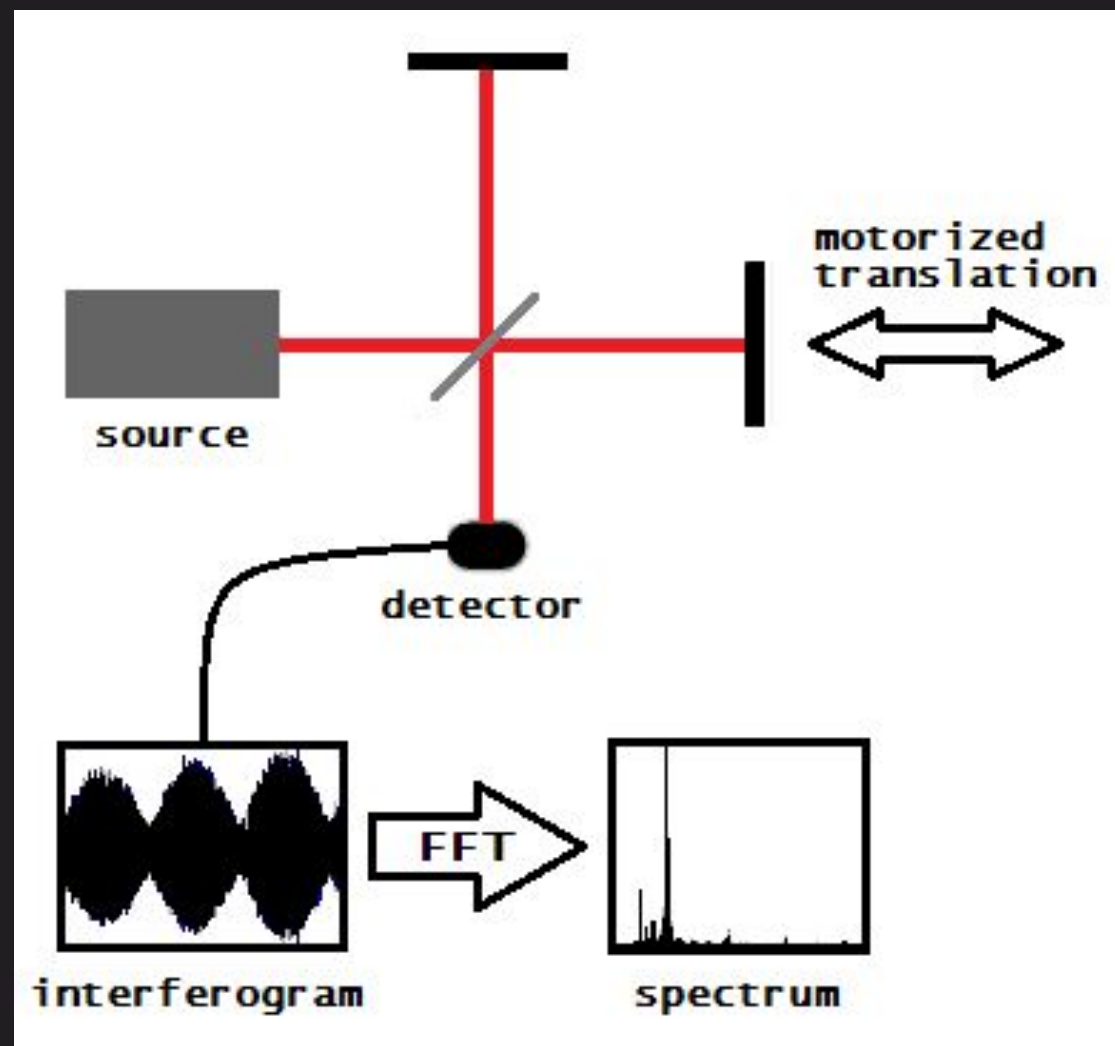
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FOURIER-TRANSFORM INFRARED SPECTROSCOPY: A BRIEF INTRODUCTION



How FTIR Spectrometers work

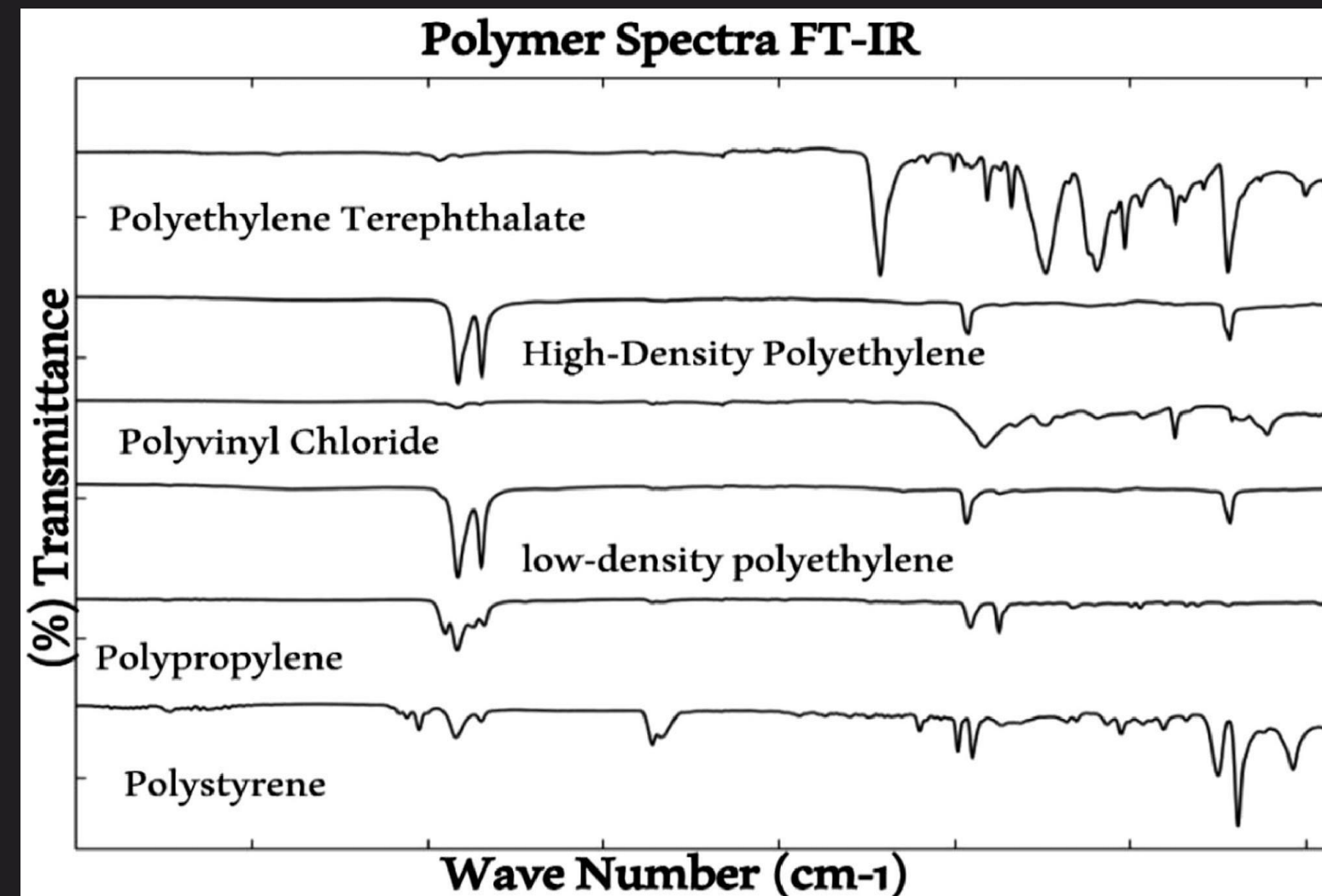
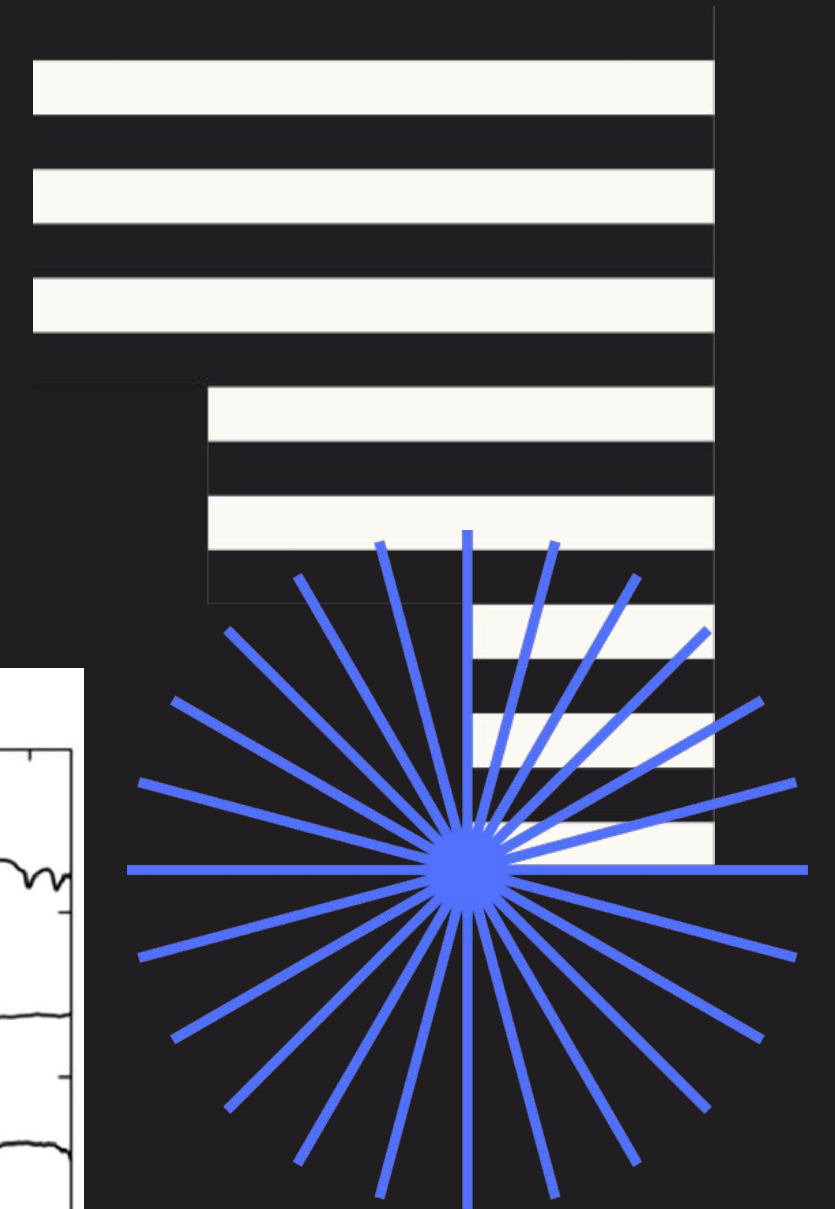
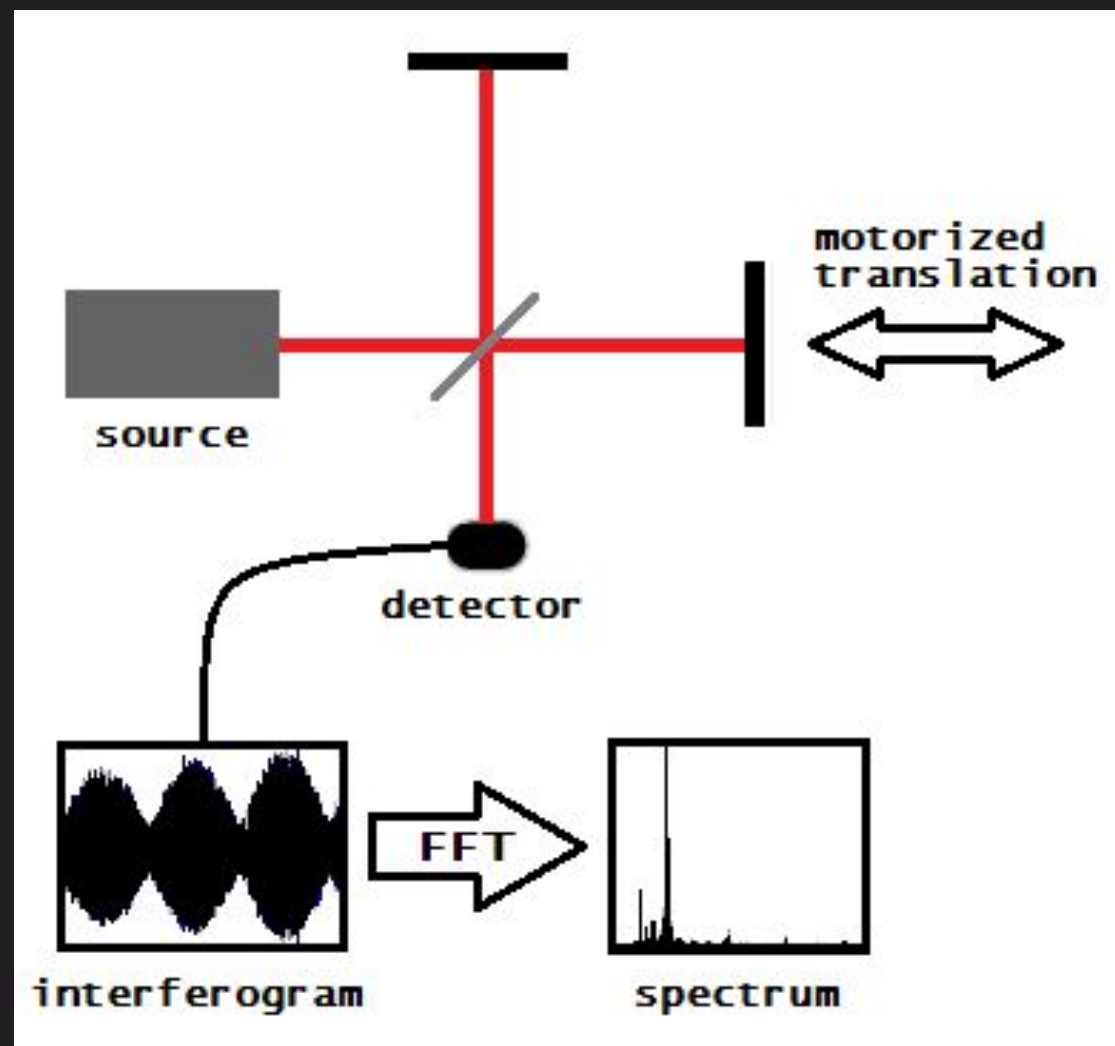


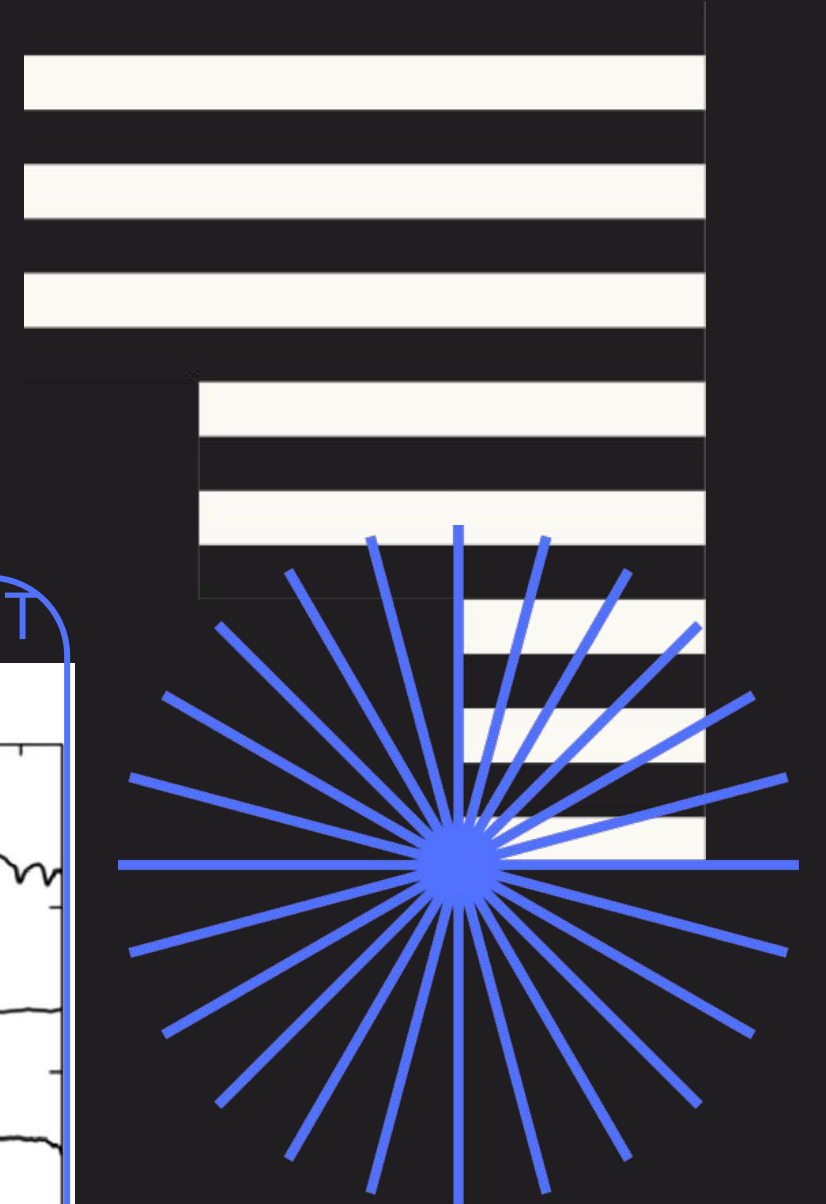
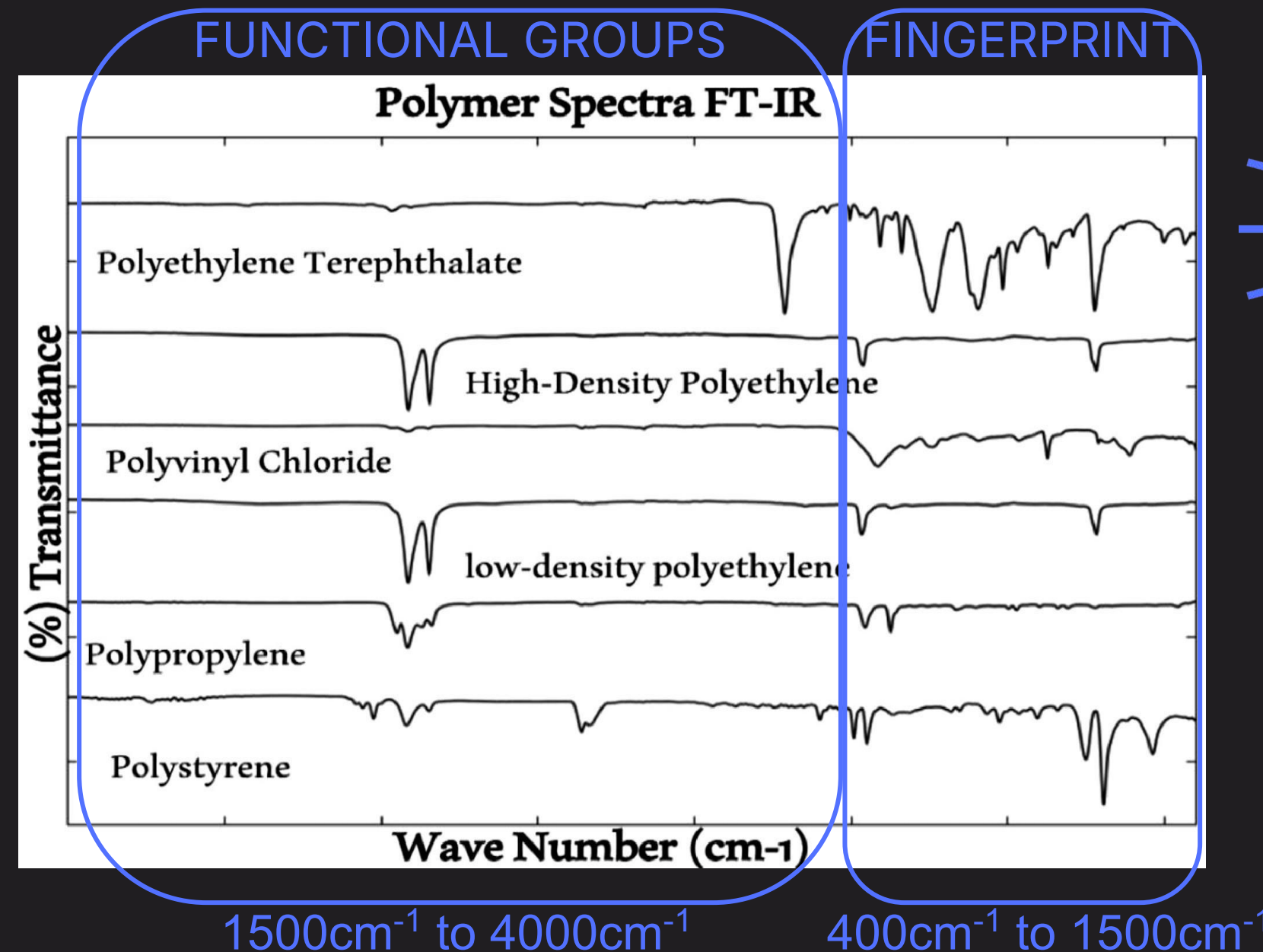
Figure of example spectra from dataset publication



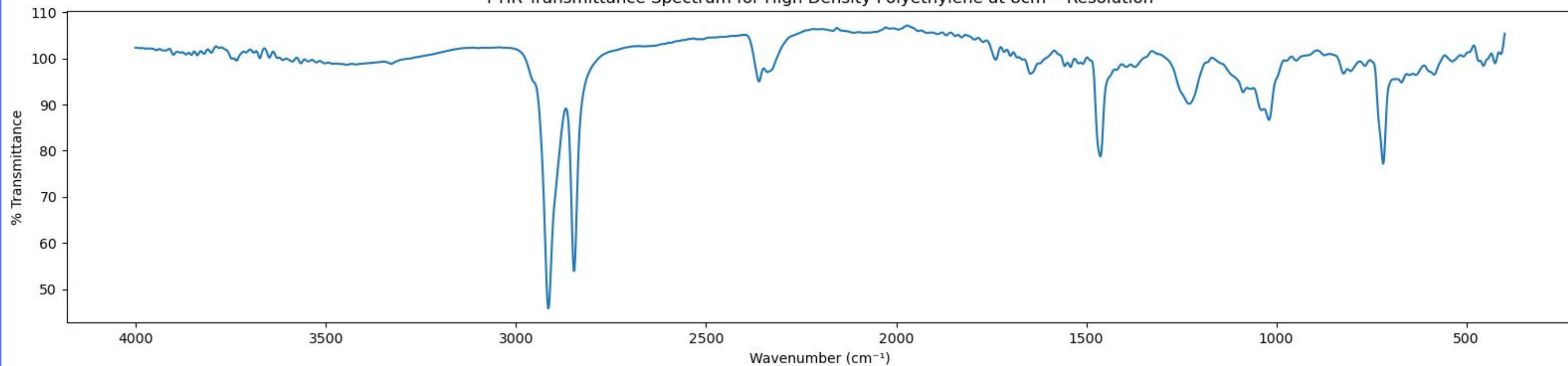
FOURIER-TRANSFORM INFRARED SPECTROSCOPY: A BRIEF INTRODUCTION



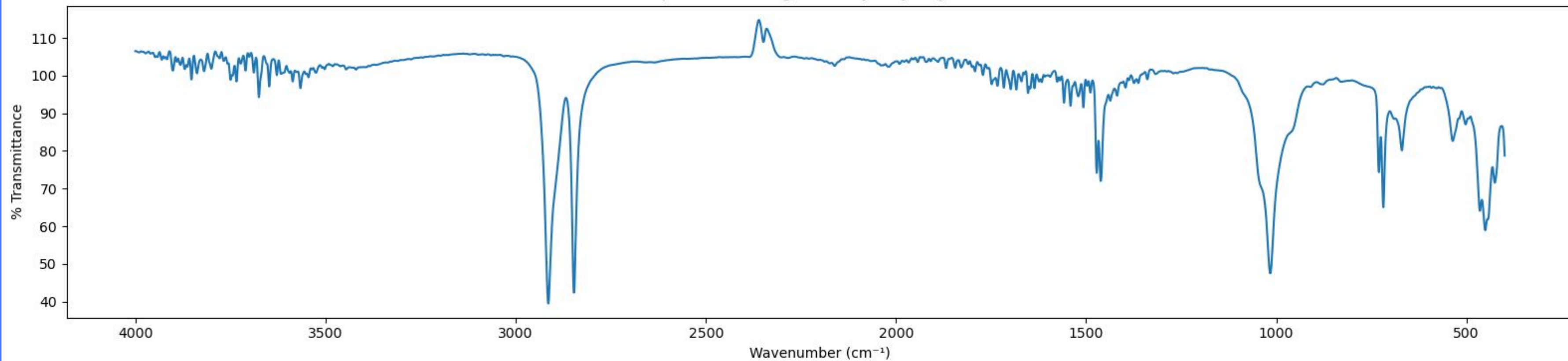
How FTIR Spectrometers work



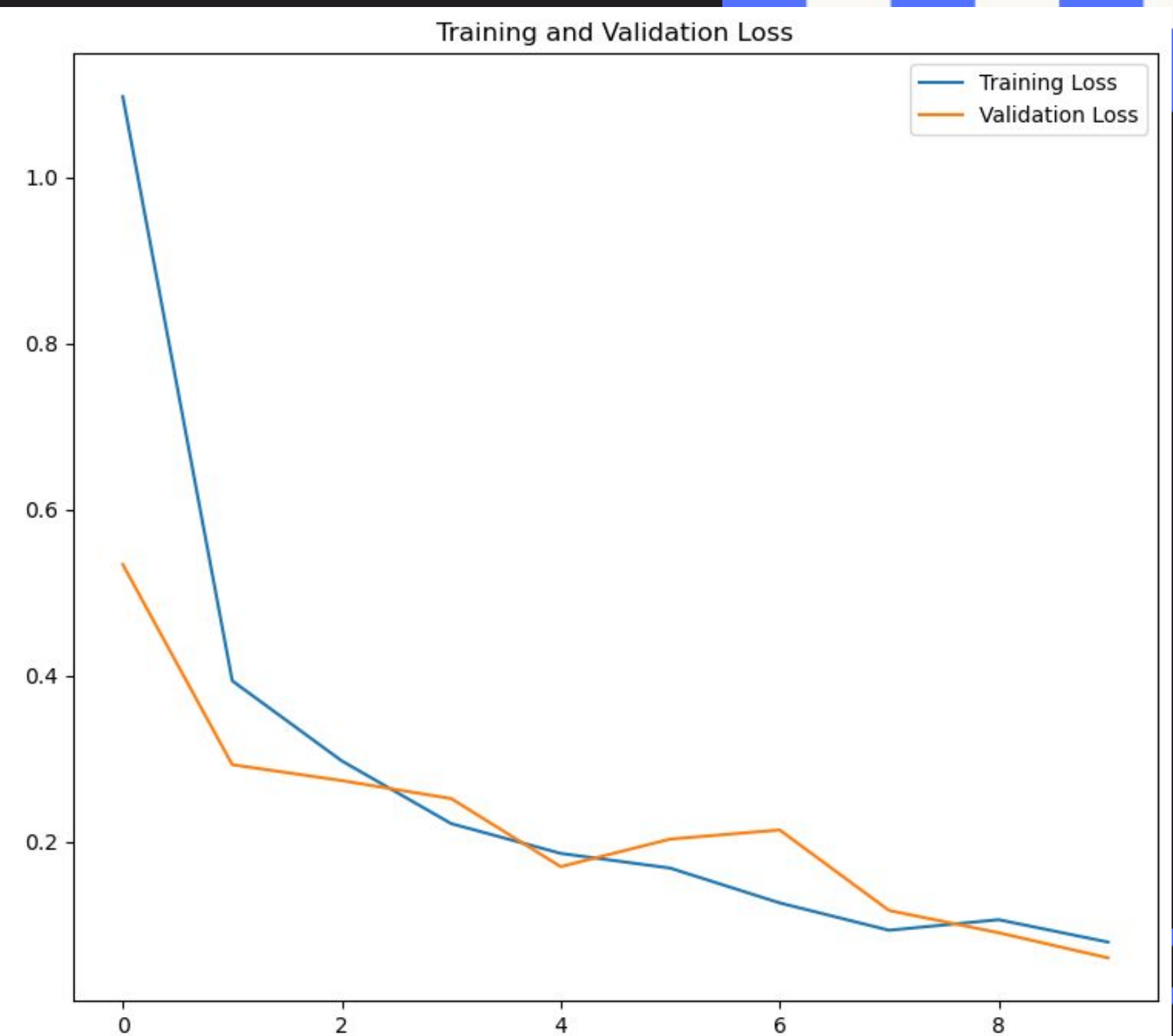
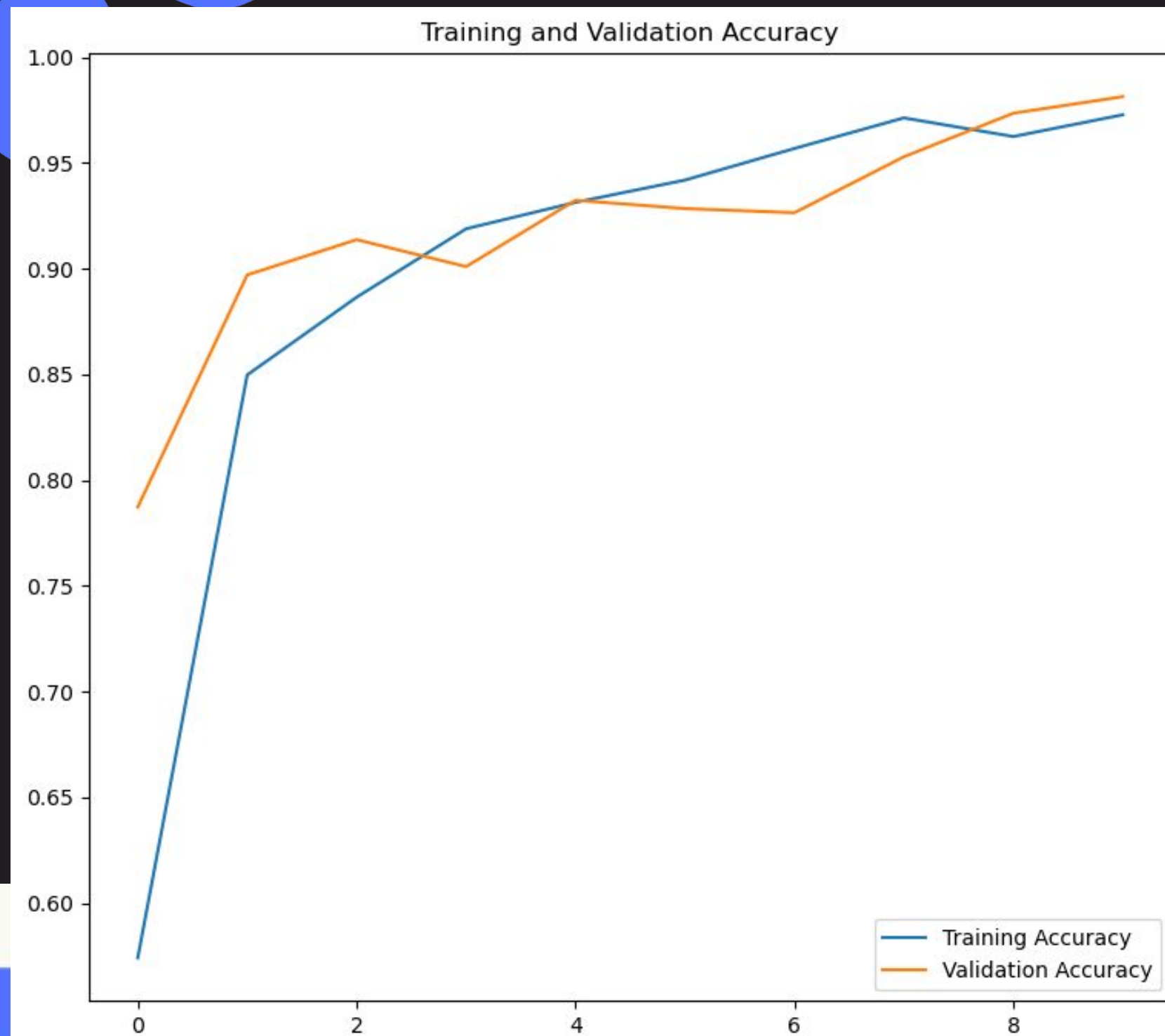
FTIR Transmittance Spectrum for High Density Polyethylene at 8cm⁻¹ Resolution



FTIR Transmittance Spectrum for High Density Polyethylene at 4cm⁻¹ Resolution



10 epochs in 45 sec: >97% accuracy

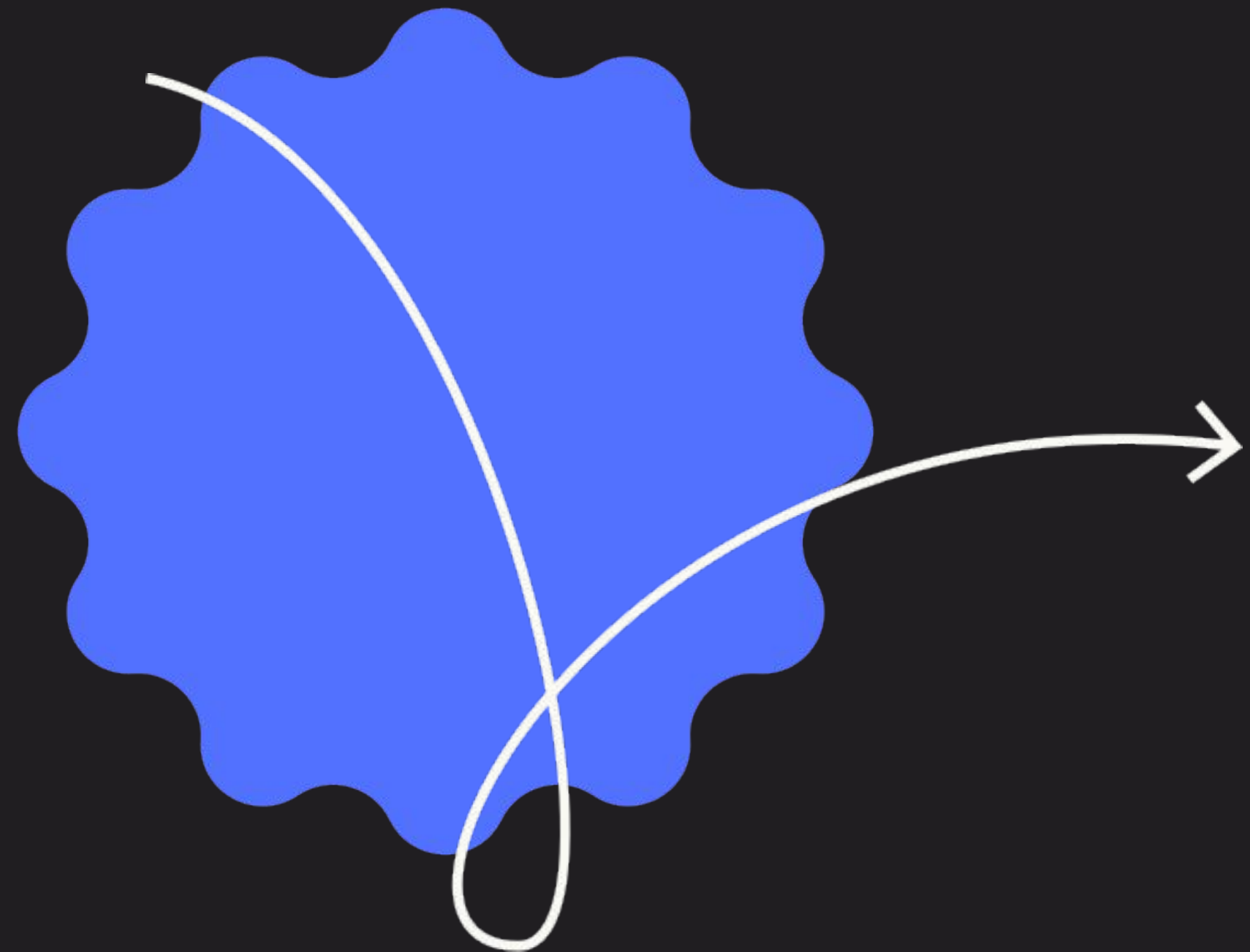


This model stabilized at ~99.5% accuracy within 50 epochs.

CONCLUSIONS & NEXT STEPS:

- FTIR spectra are eminently learnable
- There is vast potential for AI in FTIR
- Optimize current model construction
- Optimize training times
- Evaluate model on data from the wild

THANK YOU!



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