Hyperspectral Image Recunstruction from RGB images
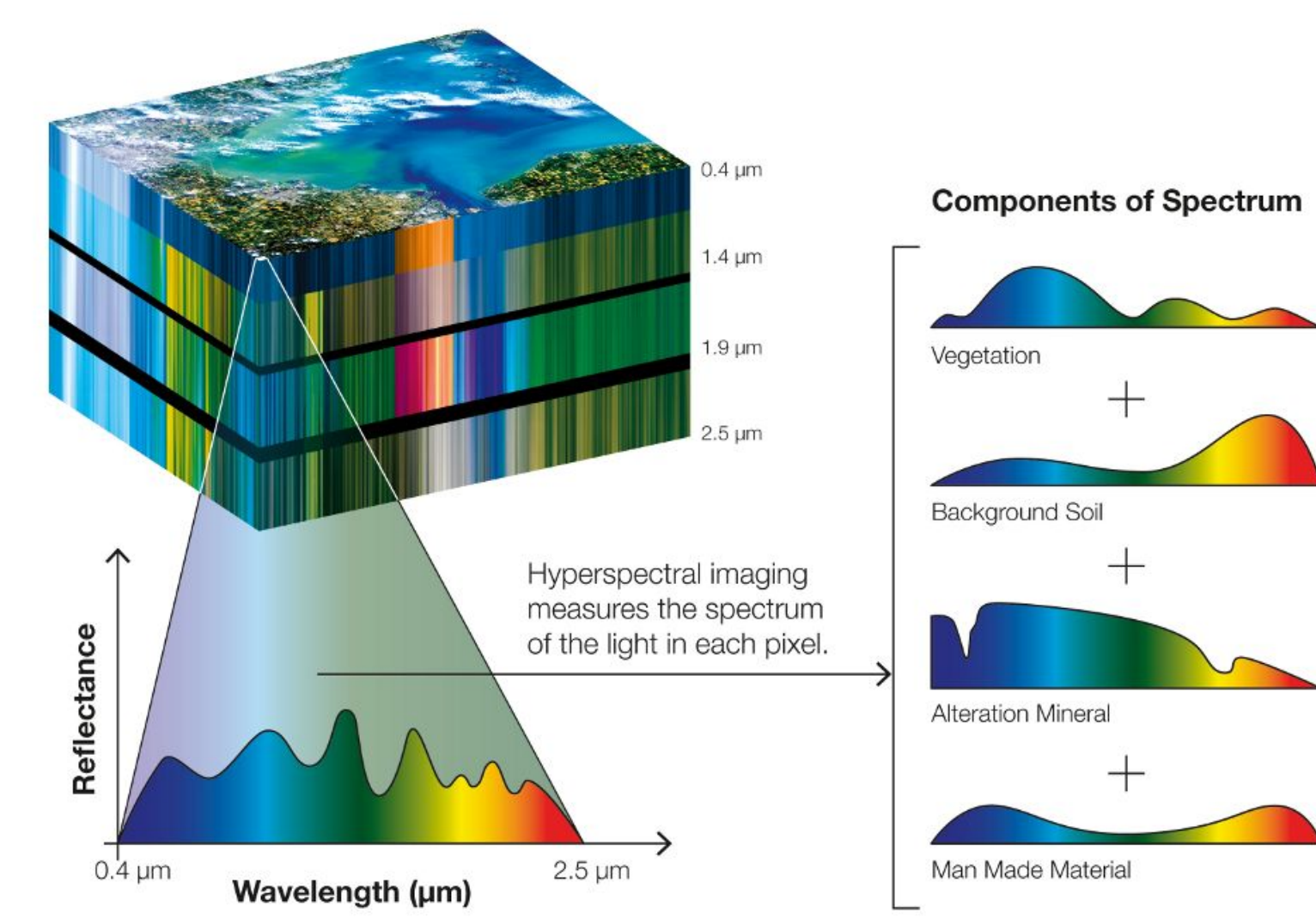
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Abstract

-> With the development of deep Convolution Neural Networks (CNNs), Hyperspectral recovery from a single RGB image has seen a great improvement.
-> Our goal is to obtain spectral out of the RGB Images.

Introduction


Hyperspectral Imaging Technology

-> Hyperspectral imaging, like other spectral imaging, collects and processes information from across the electromagnetic spectrum.

Camera Picture of a nettle plant

Quantitative Analysis of Chlorophylle
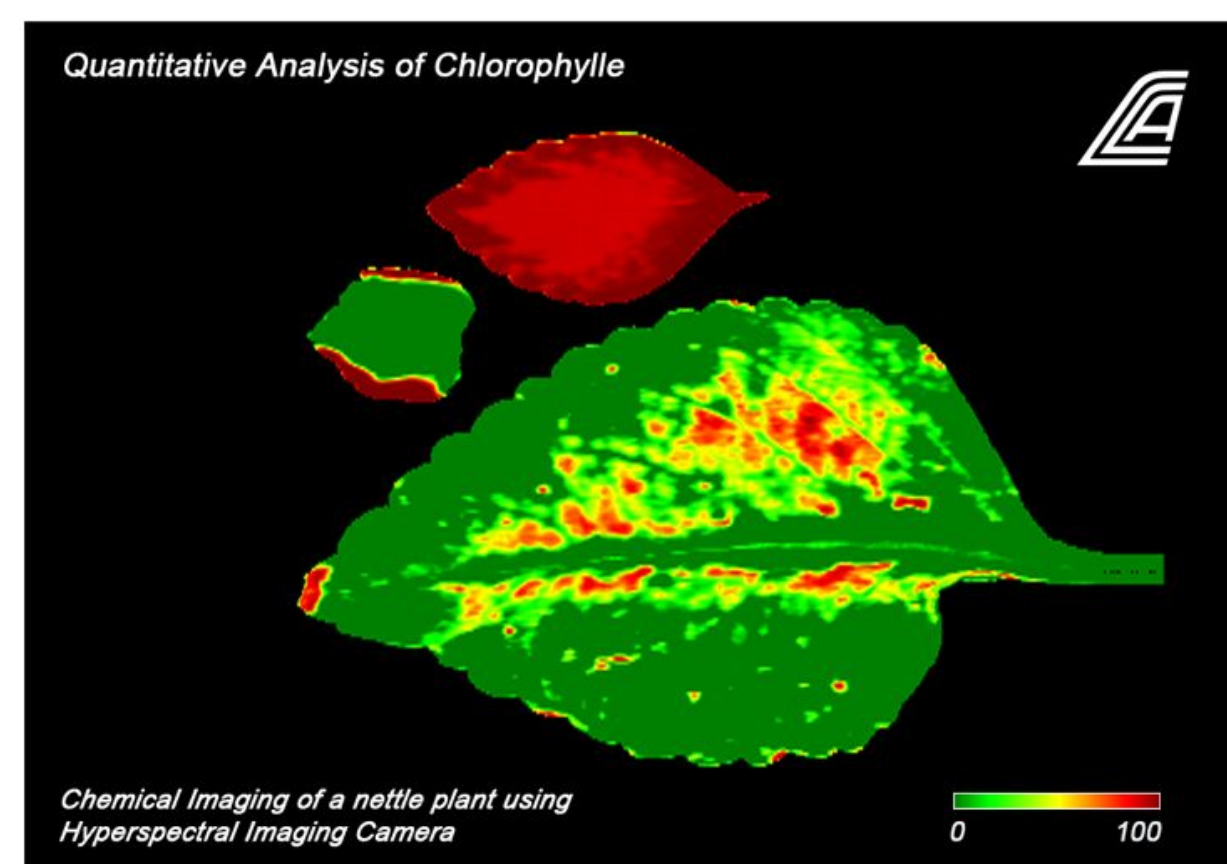
-> The goal of hyperspectral imaging is to obtain the spectrum for each pixel in the image of a scene, to find objects, identify materials, or detecting processes.
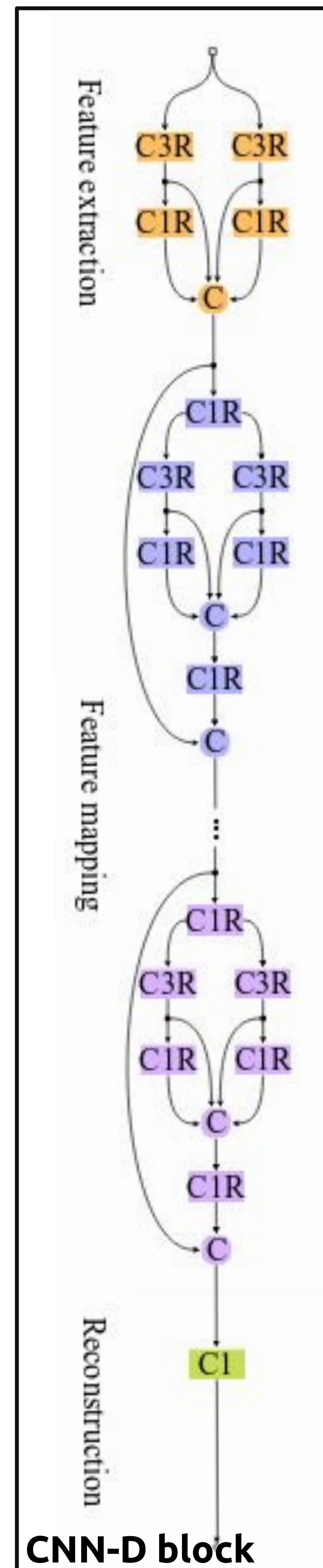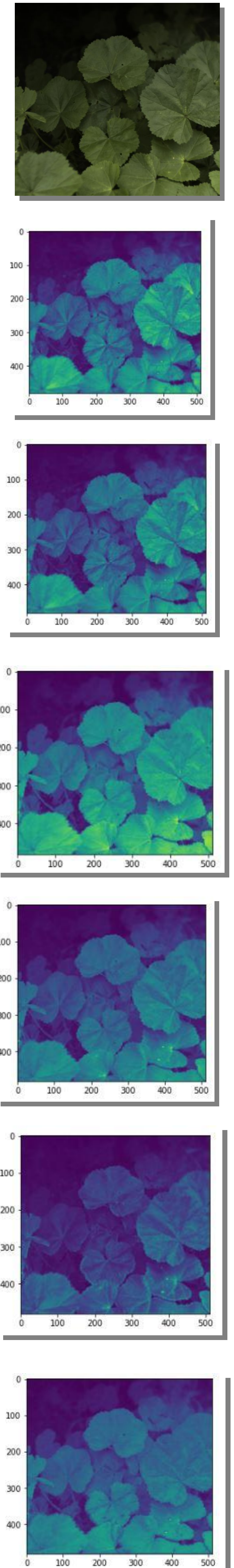
Proposed Method
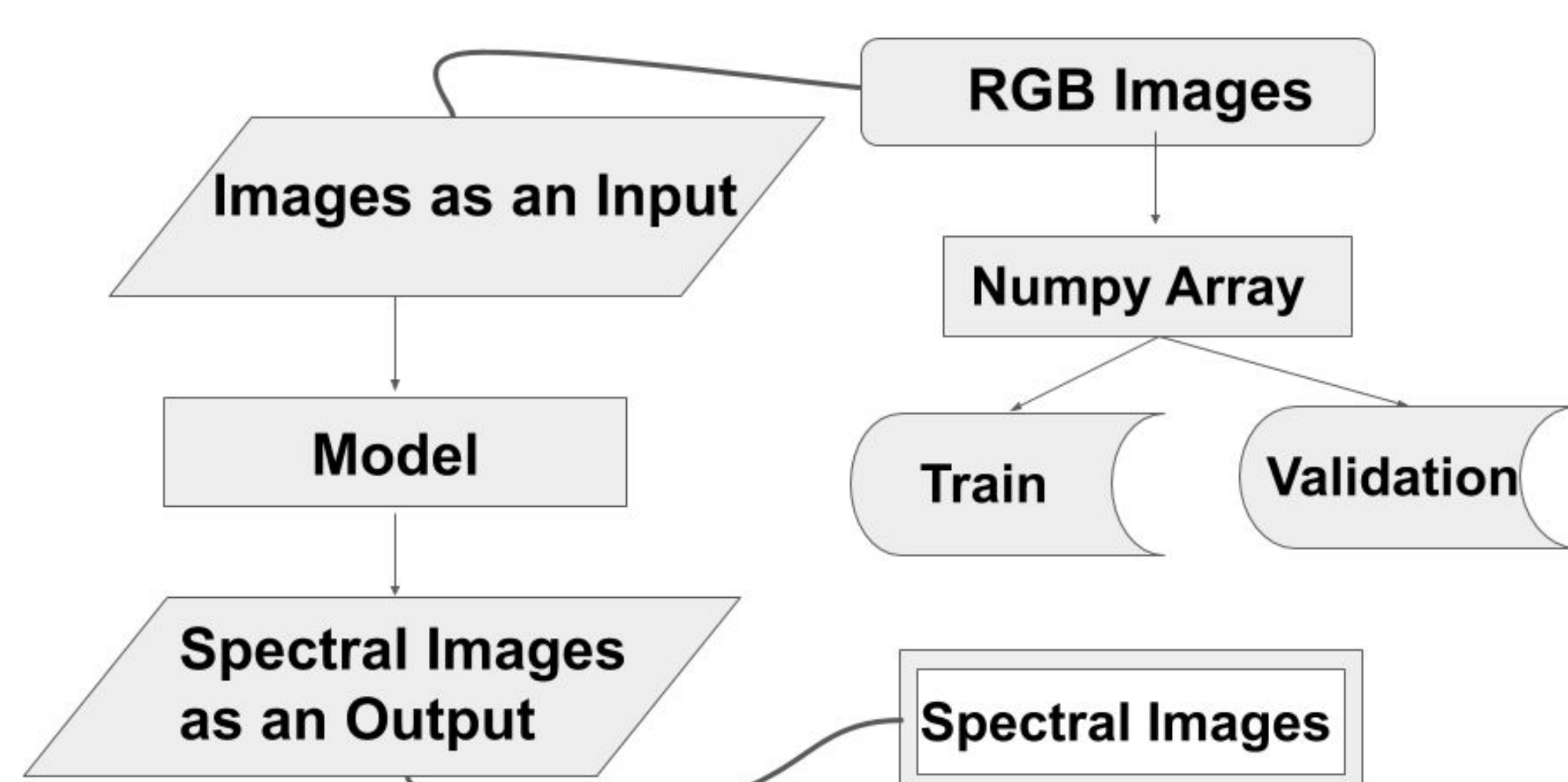
-> Model: UCNN - D

Experimental Results and Discussion

1. HS-ResidualNet
2. Attention HS-ResidualNet
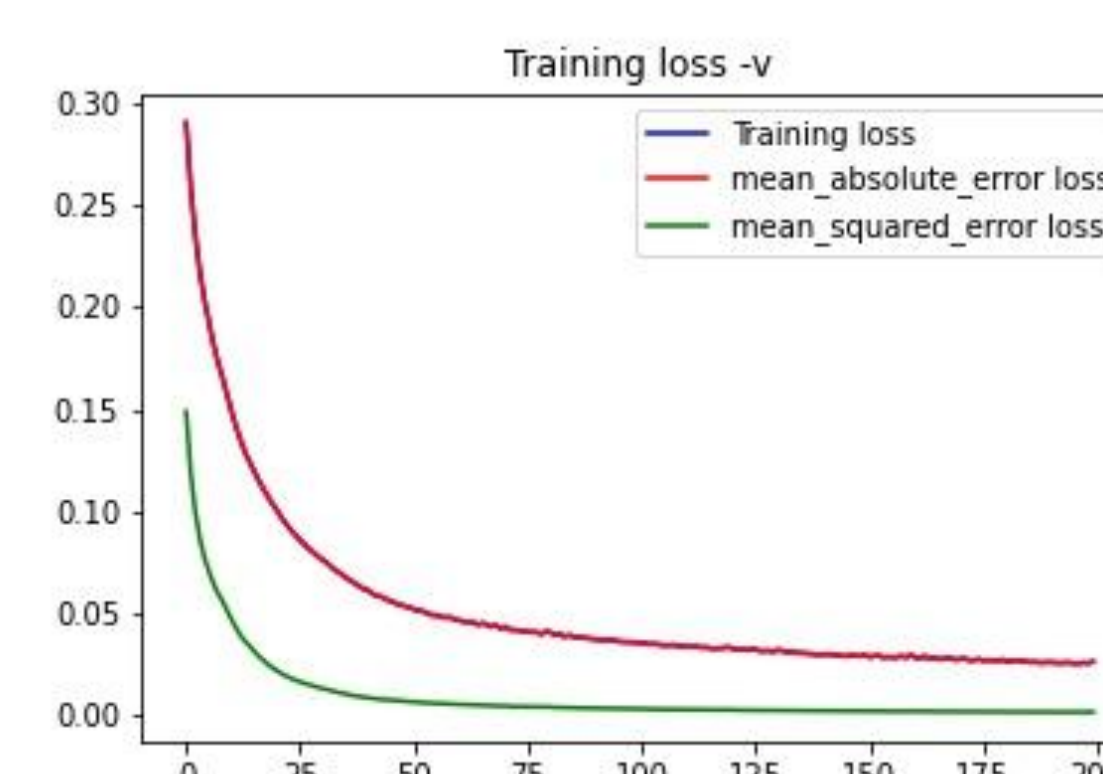3. Advanced CNN-Dense Net Model
4. UCNN-D
5. DUCNN

Attention Layer

CNN-D block

UCNN-D

Conclusions

Training loss -v

b	Start neuron	epoch	Batch Size	loss	mae	mse	Val loss	Val mae	Val mse
3	128	100	64	0.1687	0.1687	0.0620	0.1117	0.1117	0.024

References

-> NTIRE 2018 Challenge on Spectral Recunstruction from RGB Images [Link]
-> HSCNN+: Advanced CNN-Based Hyperspectral Recovery from RGB Images [Link]