



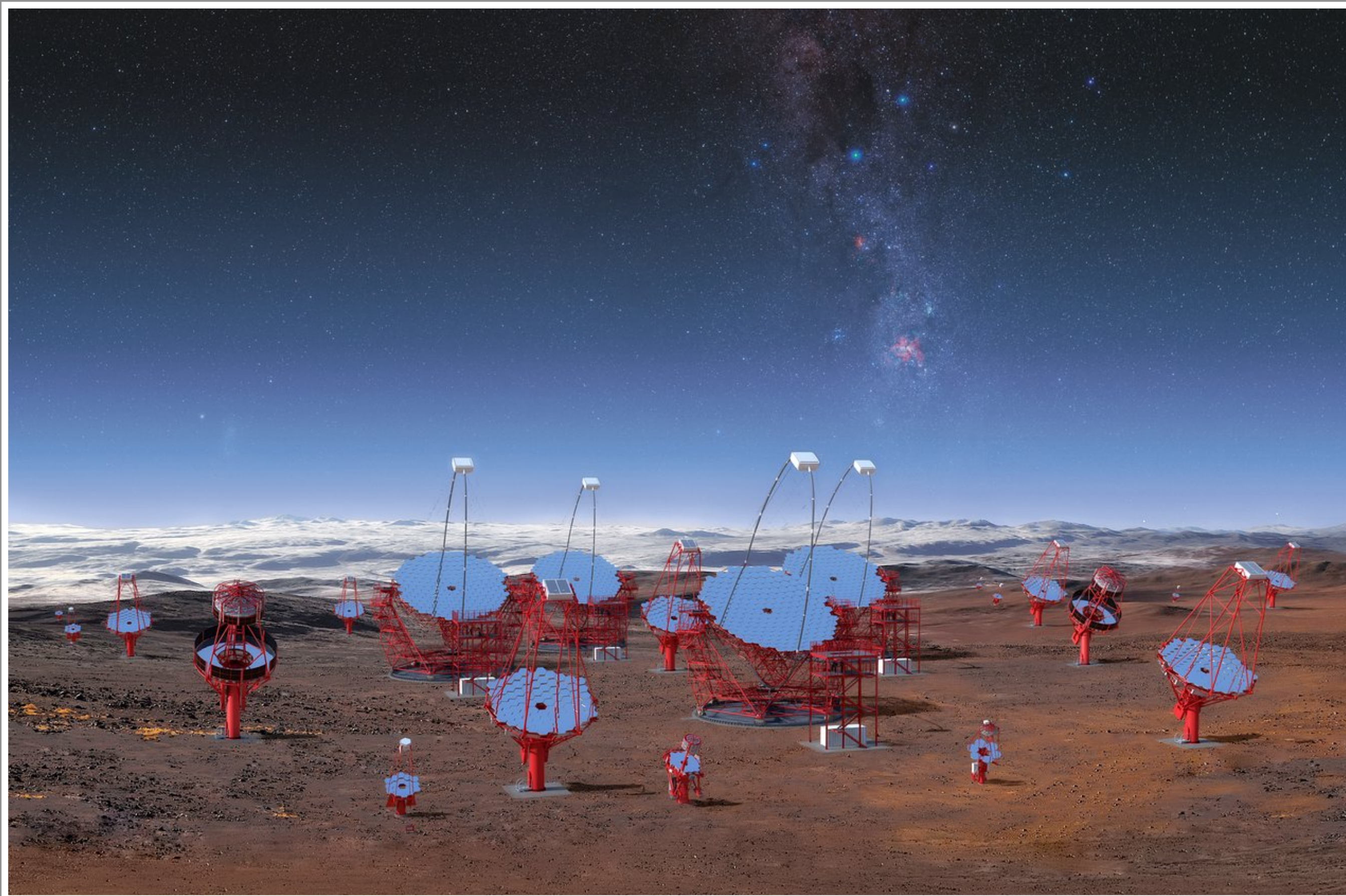
cherenkov
telescope
array

Application of pattern spectra and convolutional neural networks to the analysis of simulated Cherenkov Telescope Array data

International Cosmic Ray Conference 2021

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on behalf of the CTA Consortium

Cherenkov Telescope Array



Performance

5 - 10 x more sensitive
20 GeV - 300 TeV energy range
~ 2 arcmin angular resolution

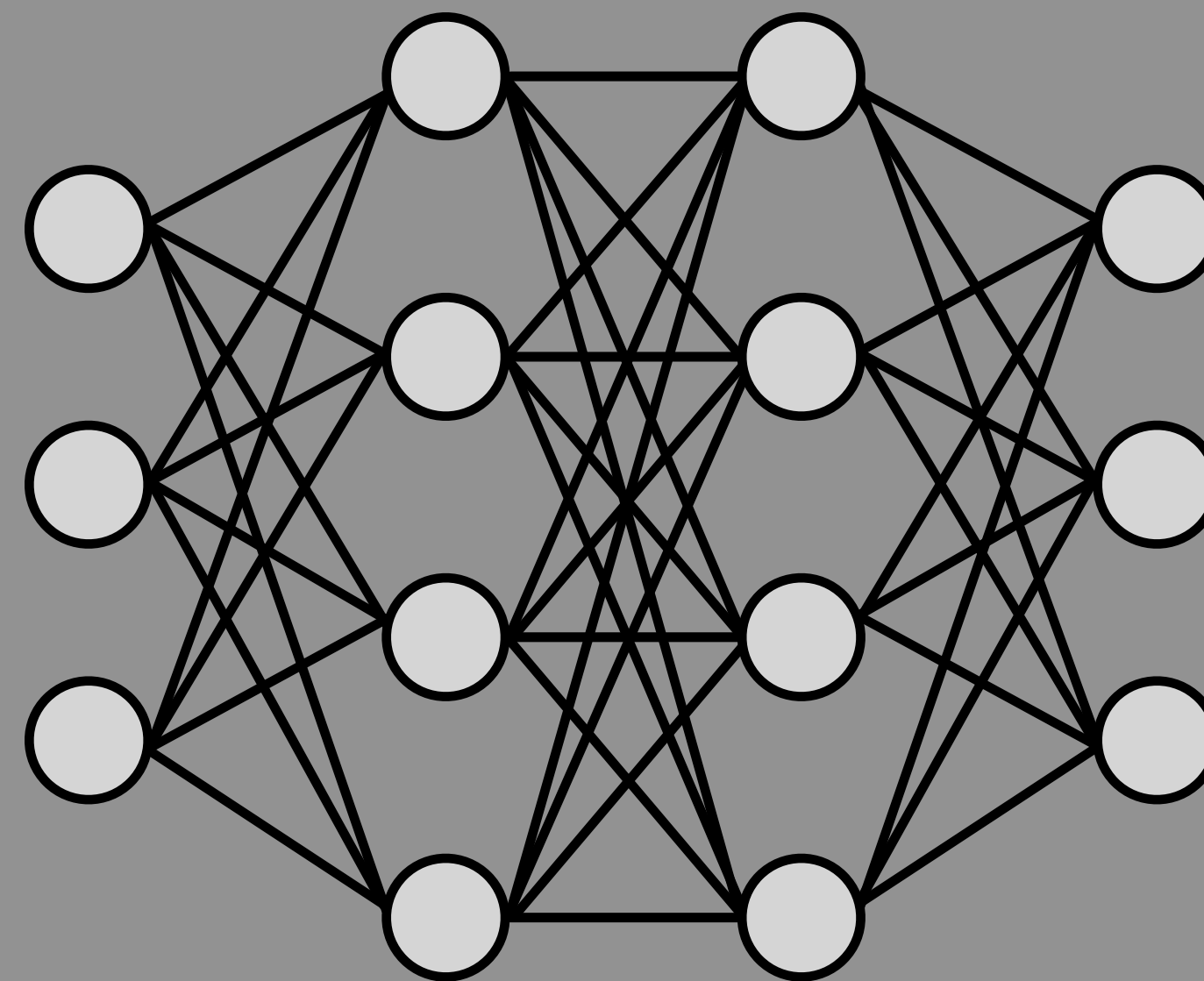
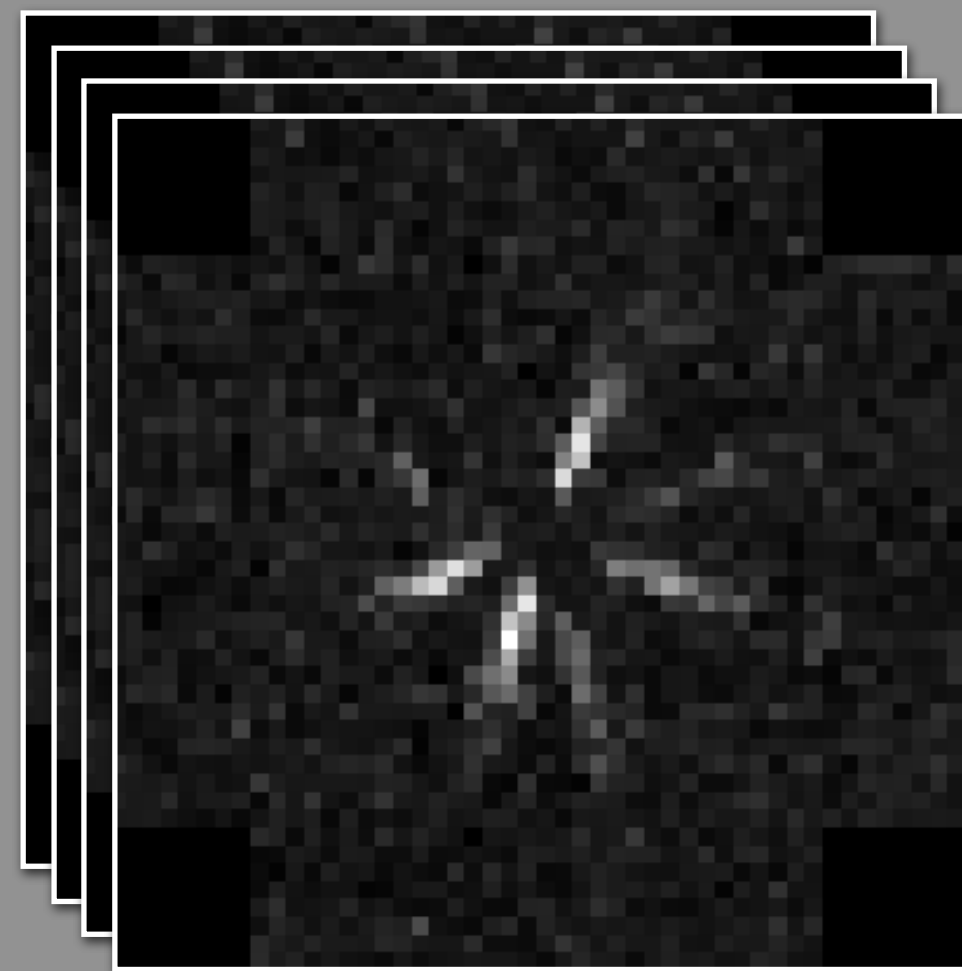
Our Approach



Input

Convolutional Neural Network

Output

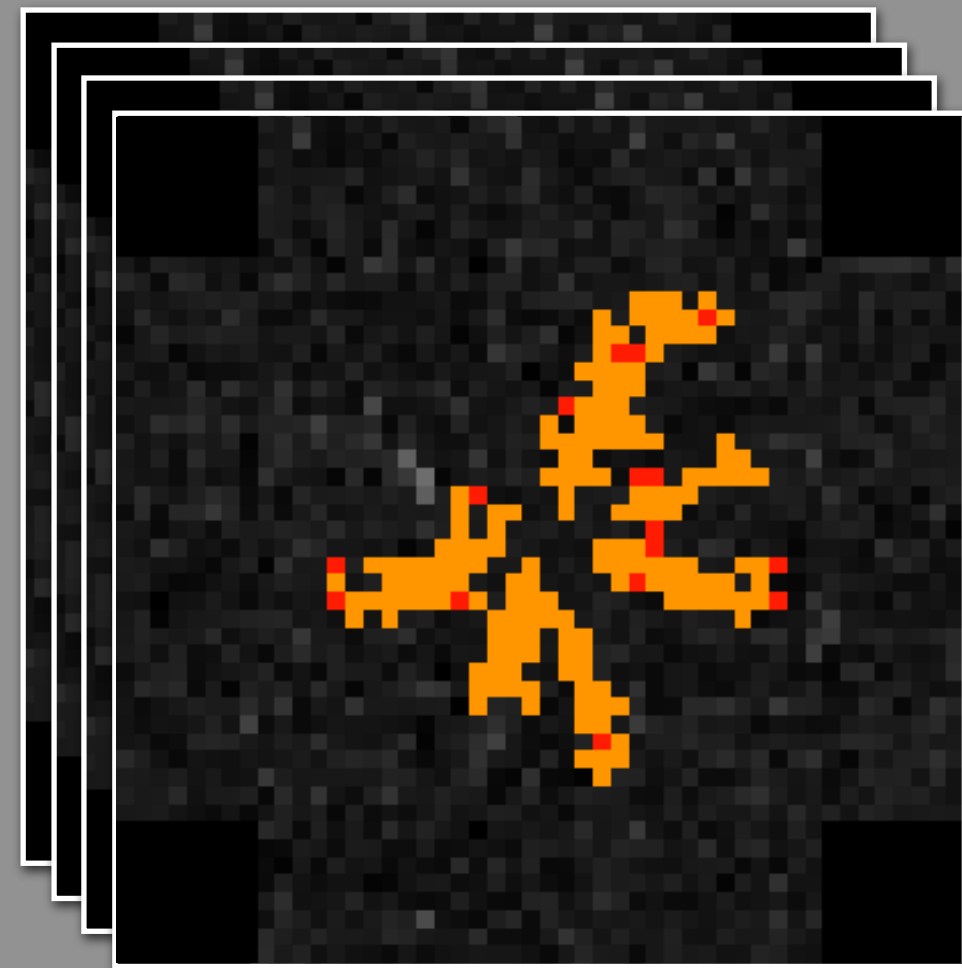


Energy

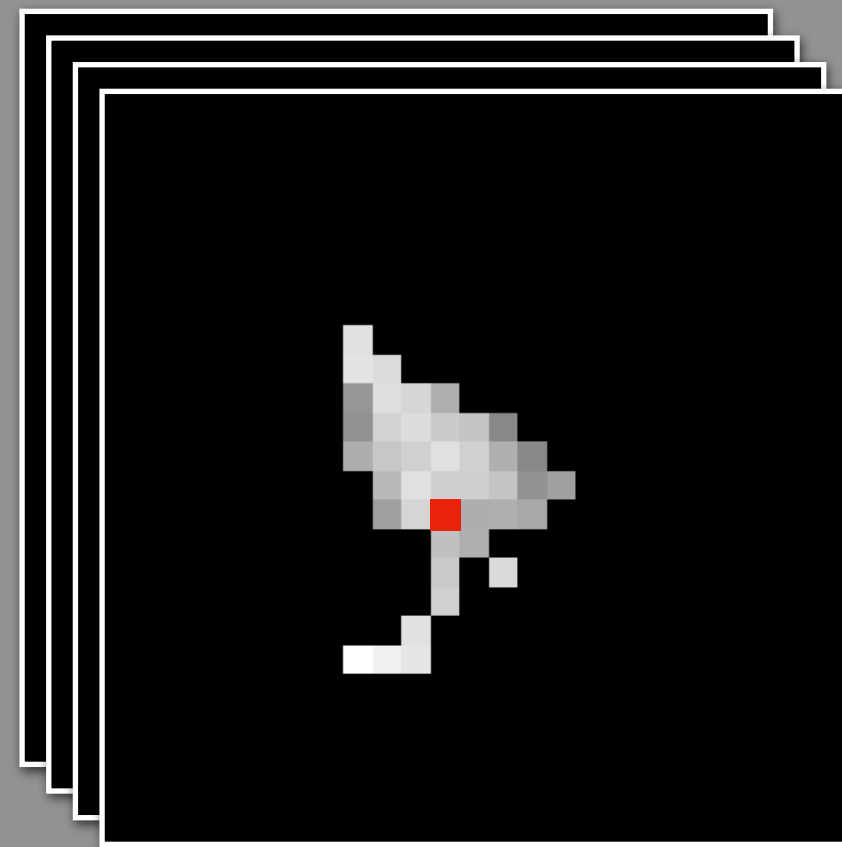
Our Approach



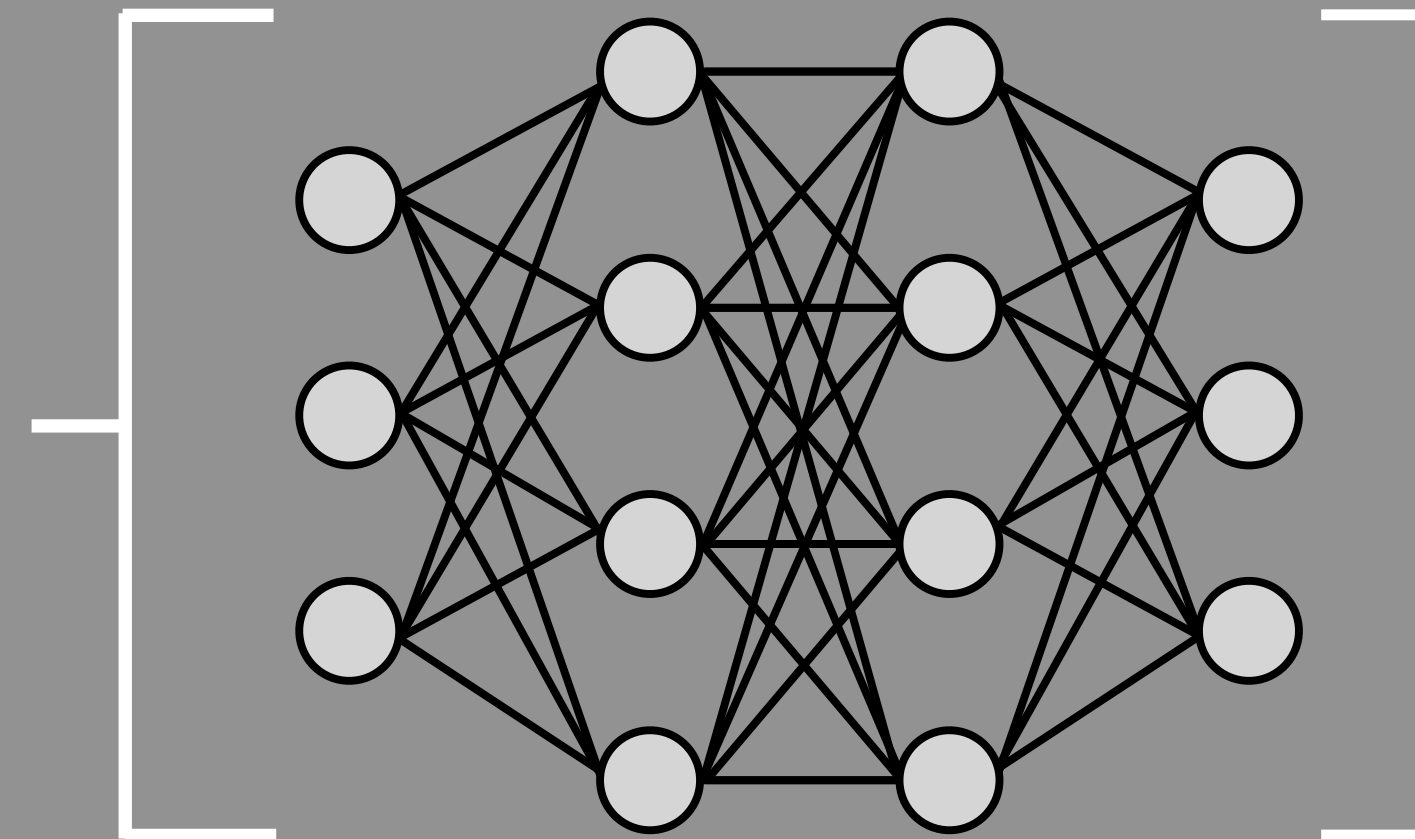
Input



Pattern Spectra*



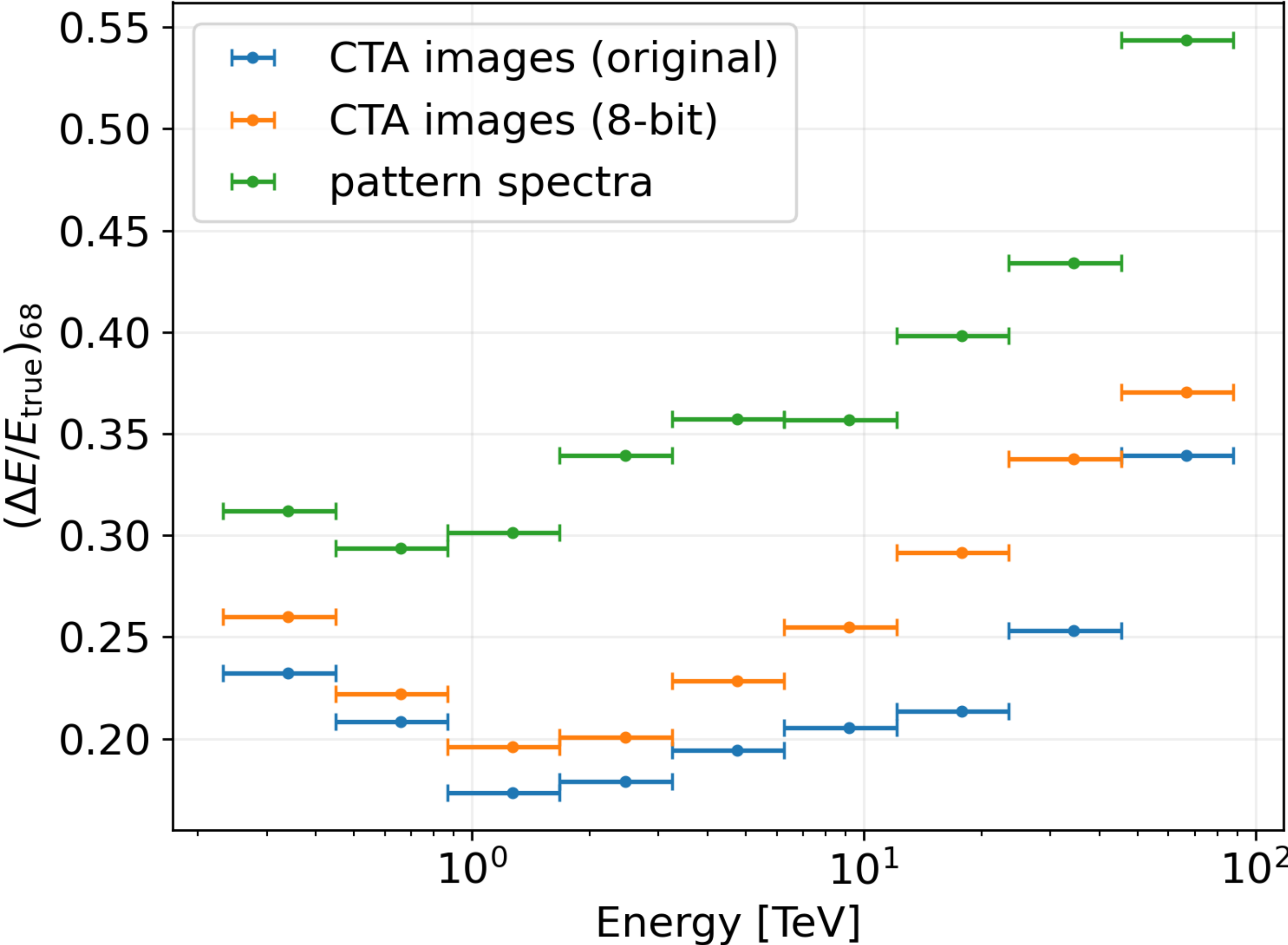
Convolutional Neural Network



Output

Energy

Results



Computational performance

Peregrine cluster - Nvidia V100 GPU

	CTA images	Pattern spectra	1 – ratio
Max. RAM	30.26 GB	10.60 GB	65%
Time	7176 s	4220 s	41%

Thanks for your attention!