

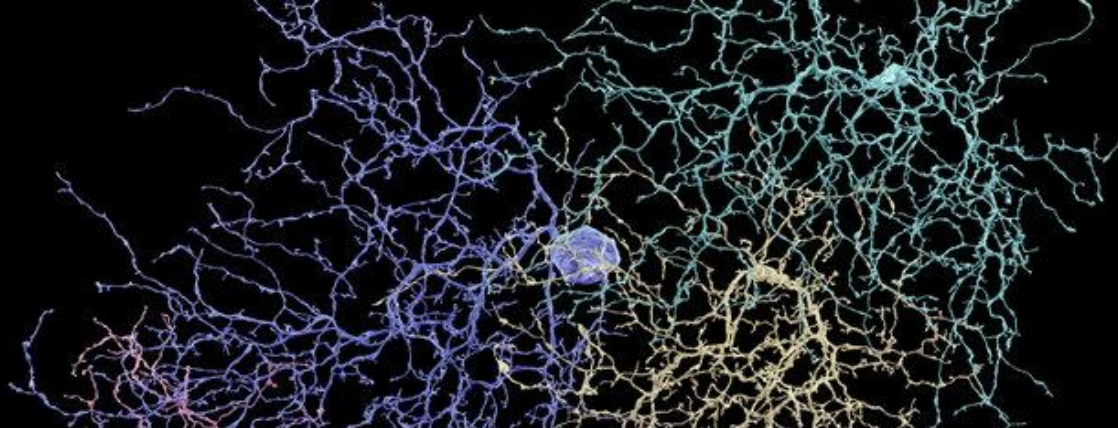


Nature...

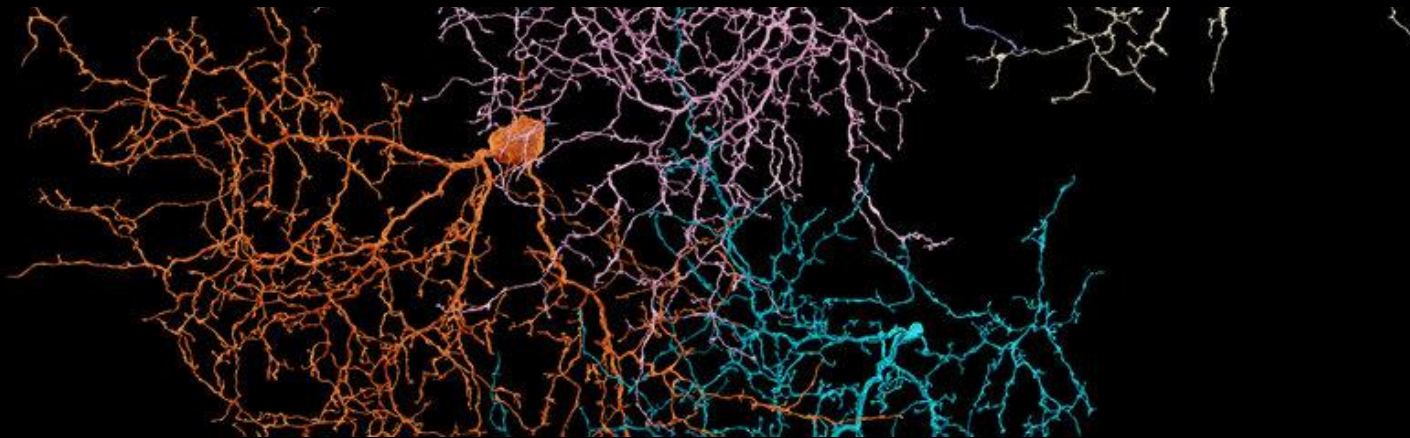
...Or Not?

Training a Neural Net to recognize whether there are man-made objects in satellite images from around the globe...and extra-terrestrial globes

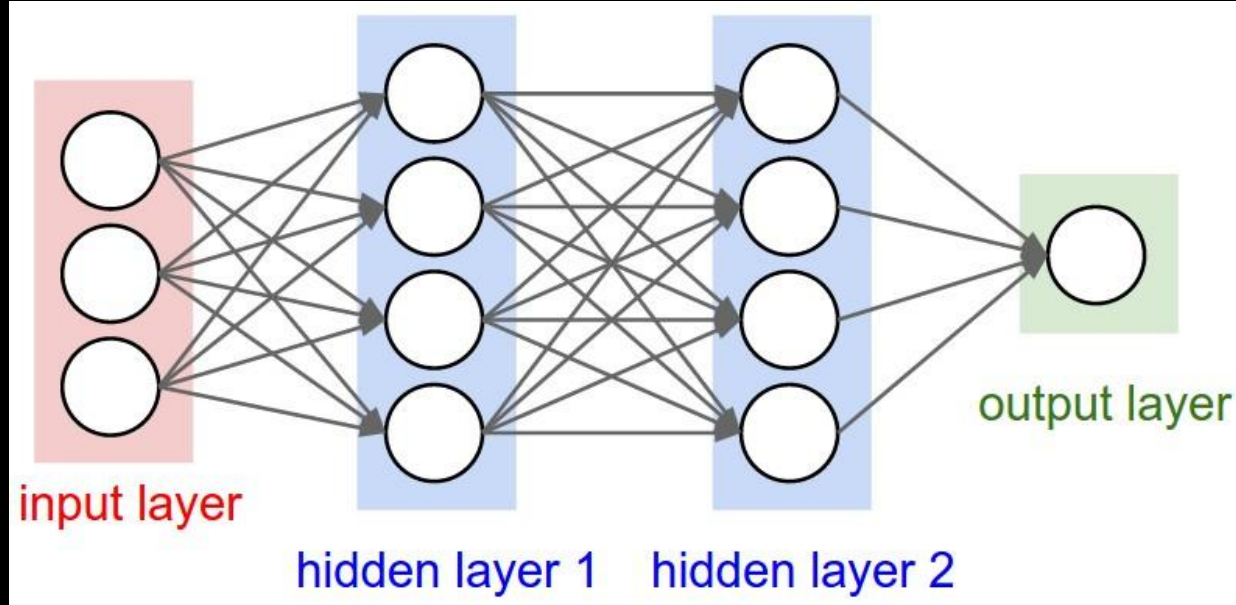
Motivation



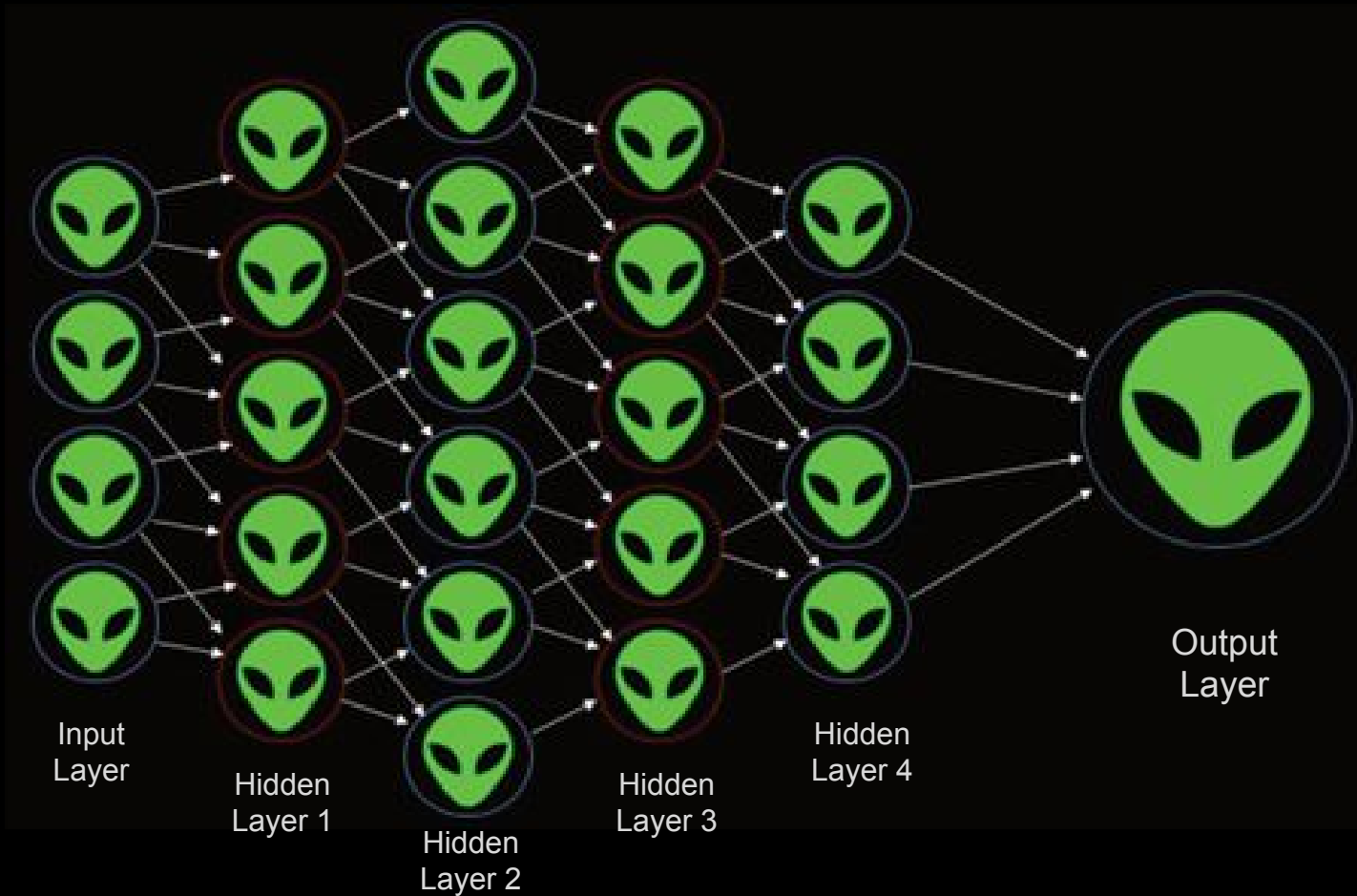
- ❑ Monitoring Land Use
- ❑ Logistic Information for Nature Disaster Areas
- ❑ Reconnaissance
- ❑ Finding intelligent life on other planets...a long shot??? Perhaps not...



Traditional Neural Network



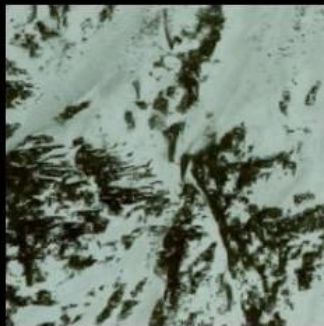
Convolutional Neural Network



Convolutional Filtering

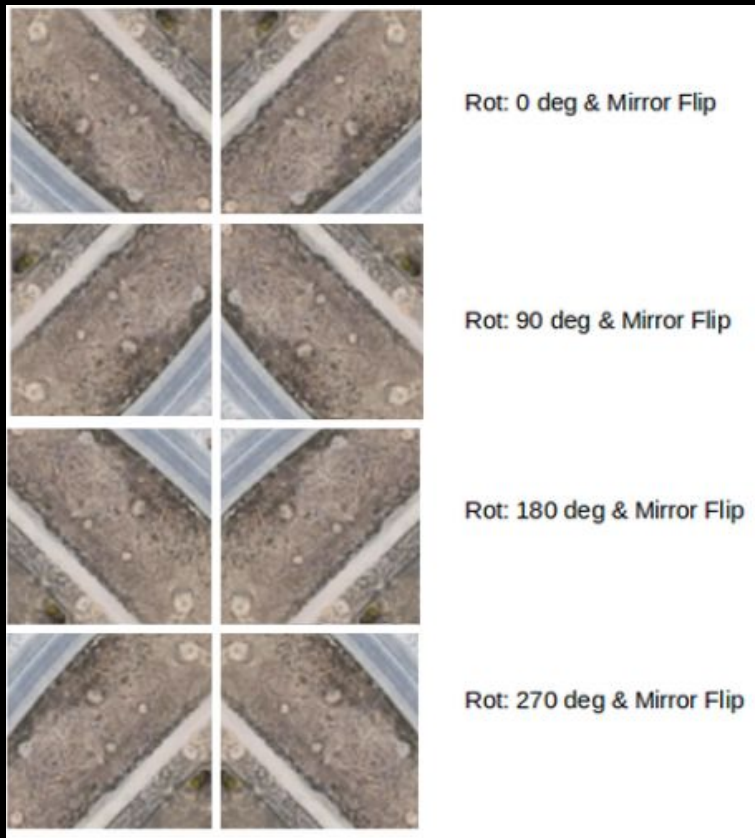


The Data

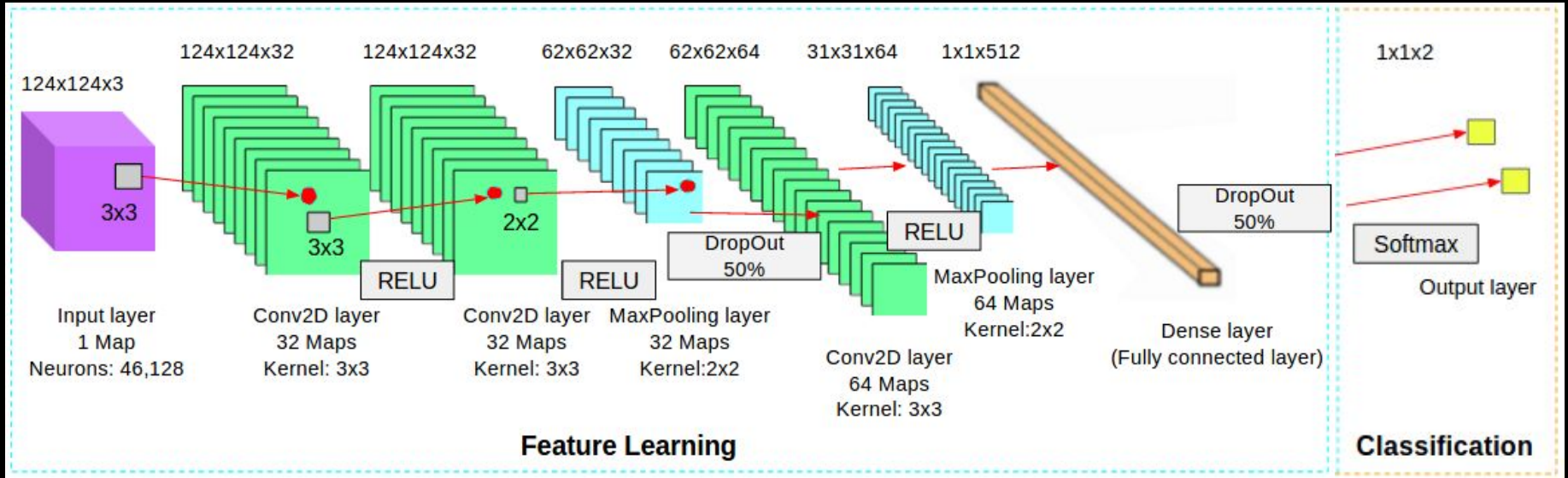


Rotating and Mirroring...

...Augment the data!

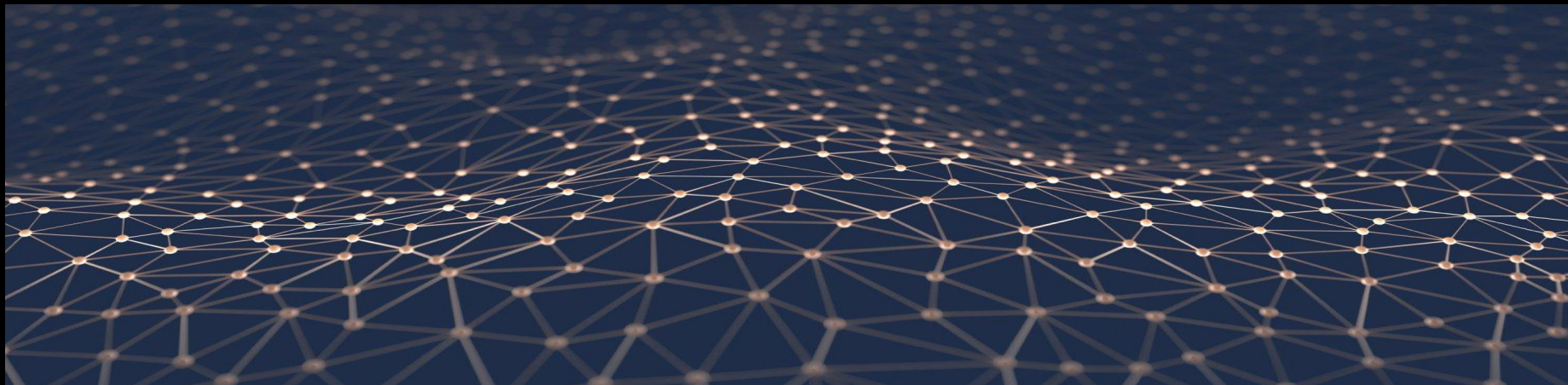


The CNN Architecture



The Results

	Accuracy	Precision	Recall	F1-Score
3-layer CNN	0.850	0.850	0.828	0.849



Fun Tests!



Data Sources

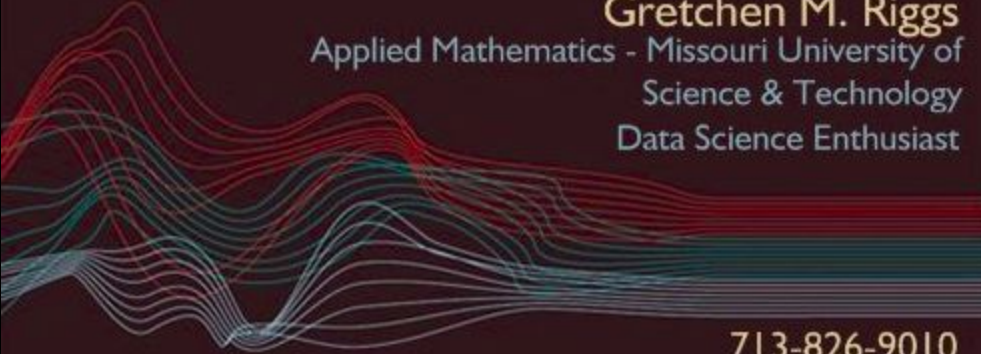
Google Maps
DigitalGlobe
Province of British Columbia
County of Stettler
Getmapping PLC
Infoterra Ltd. & BlueSky
Isle of Man Government
GeoContent
Zenrin
Datasio
GeoEye
Parks Canada
NASA
USGS
Malin Space Science Systems

INEGI
GeoBasis - DE / BKG
European Space Imaging
Instituto Geográfico Nacional
AfriGIS (Pty) Ltd.
TerraMetrics
Orion Middle East
CNES / Astrium
Landsat / Copernicus
NOAA
U.S. Navy
GEBCO
Lunar and Planetary Institute
Arizona State University
Jet Propulsion Laboratory

Technology Stack



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