Deep Learning for Land Cover Classification

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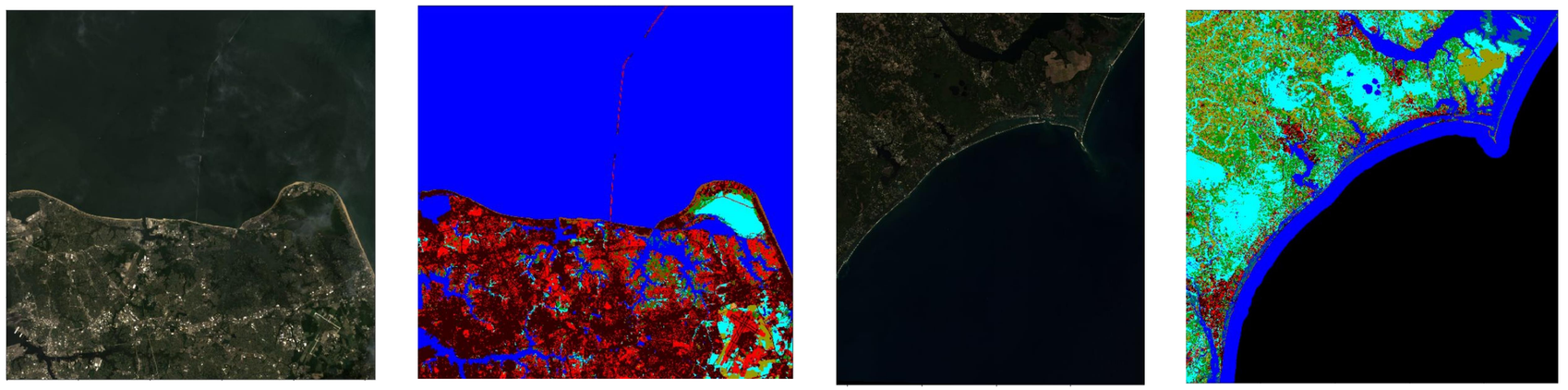
Motivation and Objectives

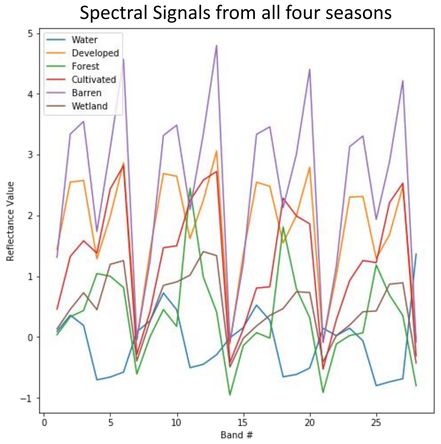
- Current land cover classification algorithms have low accuracy, are rarely run, and lack temporal context. This is a problem because measuring land cover change in our environment is crucial to understanding the effects of climate change, and human actions in our planet.
- Deep learning algorithms have shown promise in their ability to classify land cover. Our aim is to apply these tools and improve on current land cover classification algorithms.
- The best performing model is a graph model composed of two portions: A stack of Convolutional LSTM layers, and a stack of “Strange Blocks”. Both include temporal context, which is necessary due to the intraclass variance that occurs during the year.

Landsat 5 RGB Bands and Landcover Training Labels



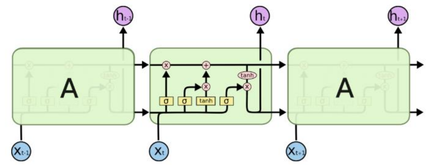
Data Information

Spectral Signals from all four seasons



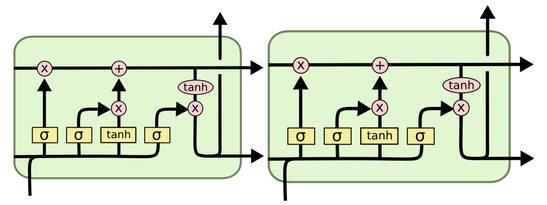
	Landsat 4-5	Wavelength (micrometers)	Resolution (meters)
Thematic Mapper (TM)	Band 1	0.45-0.52	30
	Band 2	0.52-0.60	30
	Band 3	0.63-0.69	30
	Band 4	0.76-0.90	30
	Band 5	1.55-1.75	30
	Band 6	10.40-12.50	120* (30)
	Band 7	2.08-2.35	30

RCNN Graph Architecture

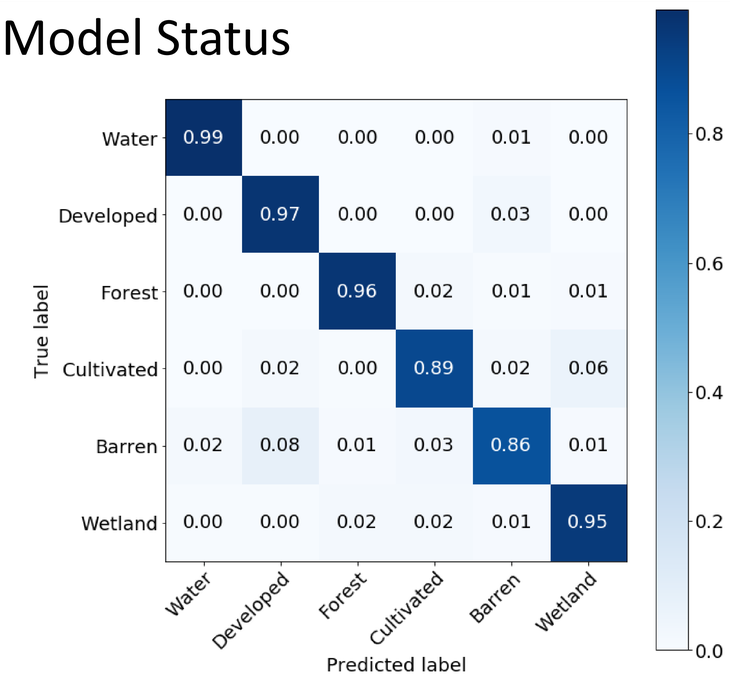


Convolutional LSTM Layers

“Strange Blocks” – Densely connected LSTM layers



Model Status



TensorFlow Keras comet Microsoft Azure

Marine Robotics & Remote Sensing

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