

Kelen Donahue
“Applying Machine Learning to Soil Freeze-Thaw Classification”
12/4/2019

I. Presentation Style

I enjoyed his presentation style. The visuals were very informative as to the input data features and the graphs gave a solid layout for his CNN/RNN hybrid implementation. In addition, his animated slides showing how the kernel convolves over a matrix in a CNN was a nice touch for people not familiar with machine learning.

II. Intellectual Merit

While he is still early on in his research and didn't have much results to show, the research seems to show intellectual merit. Soil classification seems like a logical application for image-based machine learning approach like CNNs, and the strong temporal relationships seems well-suited to an RNN. In addition, his methods for testing results seem straight-forward and sound.

III. Broader Impacts

This research should have broader economic and environmental impact. If the model is able to accurately forecast ground thaw and freeze, I imagine that will be immensely useful to commercial industries such as farming and construction. In addition, many habitats depend on consistent seasonal thaw and freeze, so understanding and predicting these cycles will also be useful to wildlife biology and other environmental sciences.