Using AI in ‘large’ ecological datasets

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Ecological datasets

• Historically small datasets from field measurements
• Recent advances in remote sensing (satellite, airborne, drones)
• Camera trapping
• Genomics
• Computational resources and skills
• Present day datasets are large and getting larger
• Many ecologists still lack computer science and ‘big data’ analytical skills
Identifying animal species in camera trap images using deep learning and citizen science

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Outstanding questions/applications for ecology

• Can CNNs be extended to directly identify ecological patterns, rather than only biophysical components that ecologists can then link together as patterns?
• How can unsupervised CNNs facilitate the identification of ecologically relevant patterns and processes without predefined classes?
• How can CNN architectures be modified to incorporate temporal data to encapsulate both spatial and phenological context?
• How best can multiple scales and/or resolutions of remotely sensed data be integrated to match the scale of different biophysical components?
• How can AI be used to make ecological predictions rather than only identify components or images and describe patterns?