

Open Challenges in Generalizable Computer Vision for Conservation



Sara Beery | AI for Conservation Decision Support @ Harvard CRCS | 10-20-22



Data is diverse and complementary



Seeing biodiversity: perspectives in machine learning for wildlife conservation, Tuia*, Kellenberger*, Beery*, Costelloe*, et al., Nature Comms (to appear)

Data is not IID and models do not generalize



Map of global biodiversity

Species occurrence data in GBIF

Scaling Biodiversity Monitoring for the Data Age - ACM XRDS 2021

Auto Arborist: automating tree censuses across modalities 23 cities, 344 genera, 2.6M tree records, >1M trees w/ imagery



City: Los Angeles, Genus: Washingtonia

City: Denver, Genus: Quercus



Acer Fraxinus Ulmus Ouercus Picea Prunus Tilia Platanus Gleditsia Populus Pinus Liquidambar Lagerstroemia Washingtonia Ficus Afrocarpus Other

Distribution Shifts Across Cities





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Data is not IID and models do not generalize



Generality, specificity, and reliability are linked





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MegaDetector generalizes well to new species, new habitat types, and new parts of the world



Used to process data for over 40 NGOs and conservation organizations globally, over 100M images last year

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For decision support and evaluation, it's important that end users do QC and understand HOW to use the models for their task, given their risk



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We need to build interdisciplinary capacity

Summer School on Computer Vision Methods for Ecology

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