

Birds.ai

Fine-tuning on the Fly with Jetson TX1

Anouk Visser, CTO



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- Managing your assets with AI
- Inspection
- Nature Conservation
- Precision Agriculture
- Wildlife Monitoring

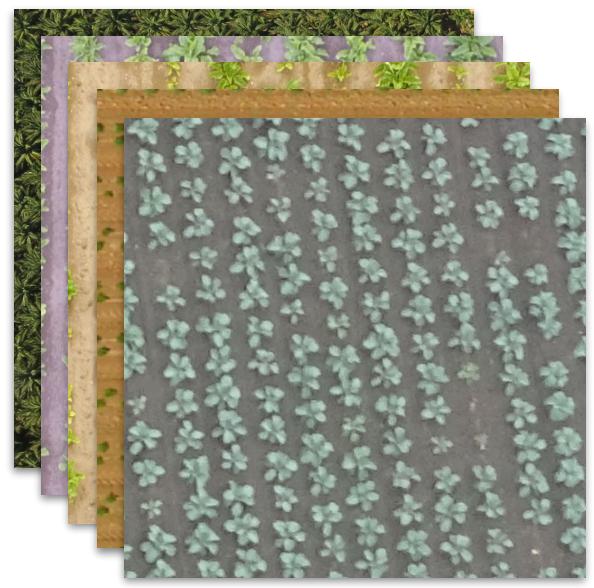


An aerial photograph of a citrus orchard. The orchard is organized into several distinct sections. In the upper left, there are long, narrow rows of trees, likely young trees or a different variety. To the right of these, there are larger, more densely packed sections of trees. A small, orange agricultural drone is visible in the lower right section, positioned near a dirt path that cuts through the orchard. The trees are green and appear healthy.

Precision Agriculture



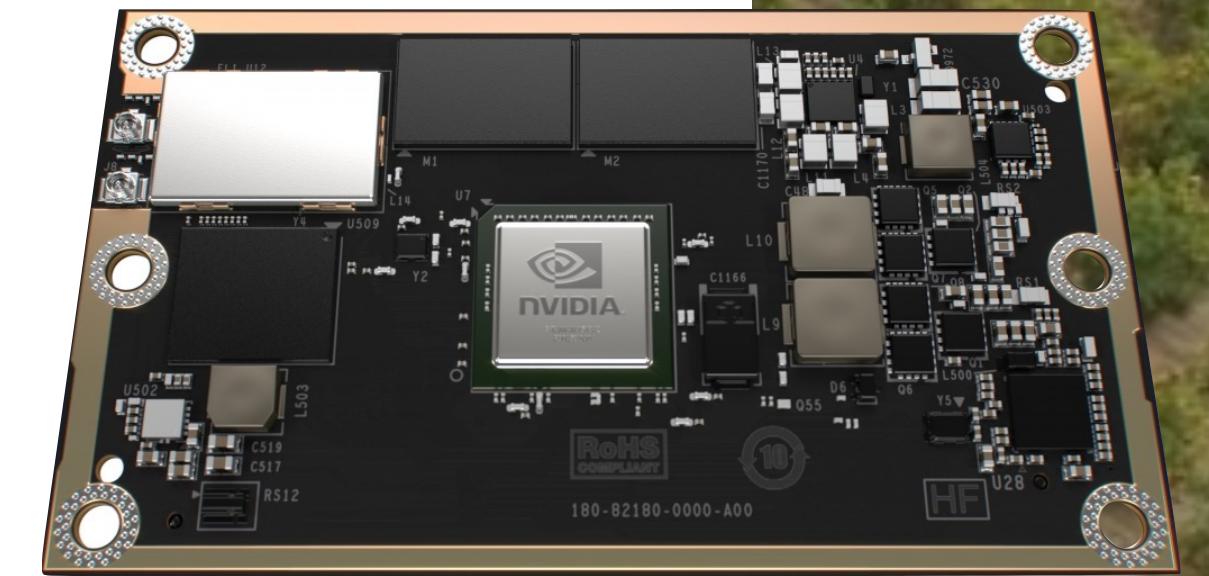
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Data



Train



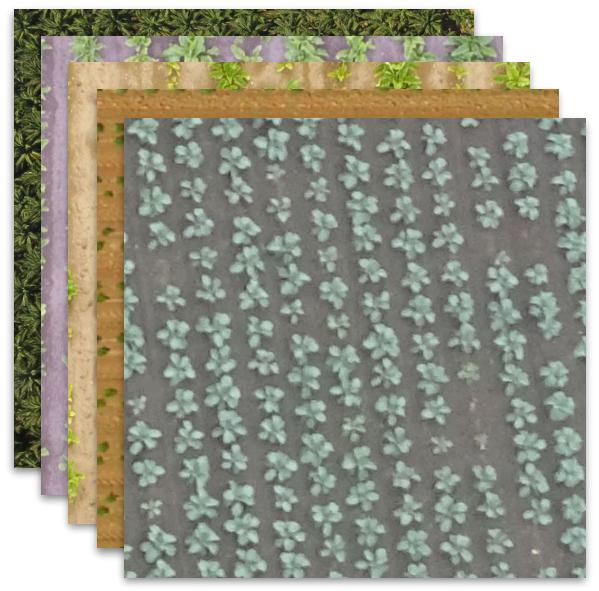
Deploy



Expectation



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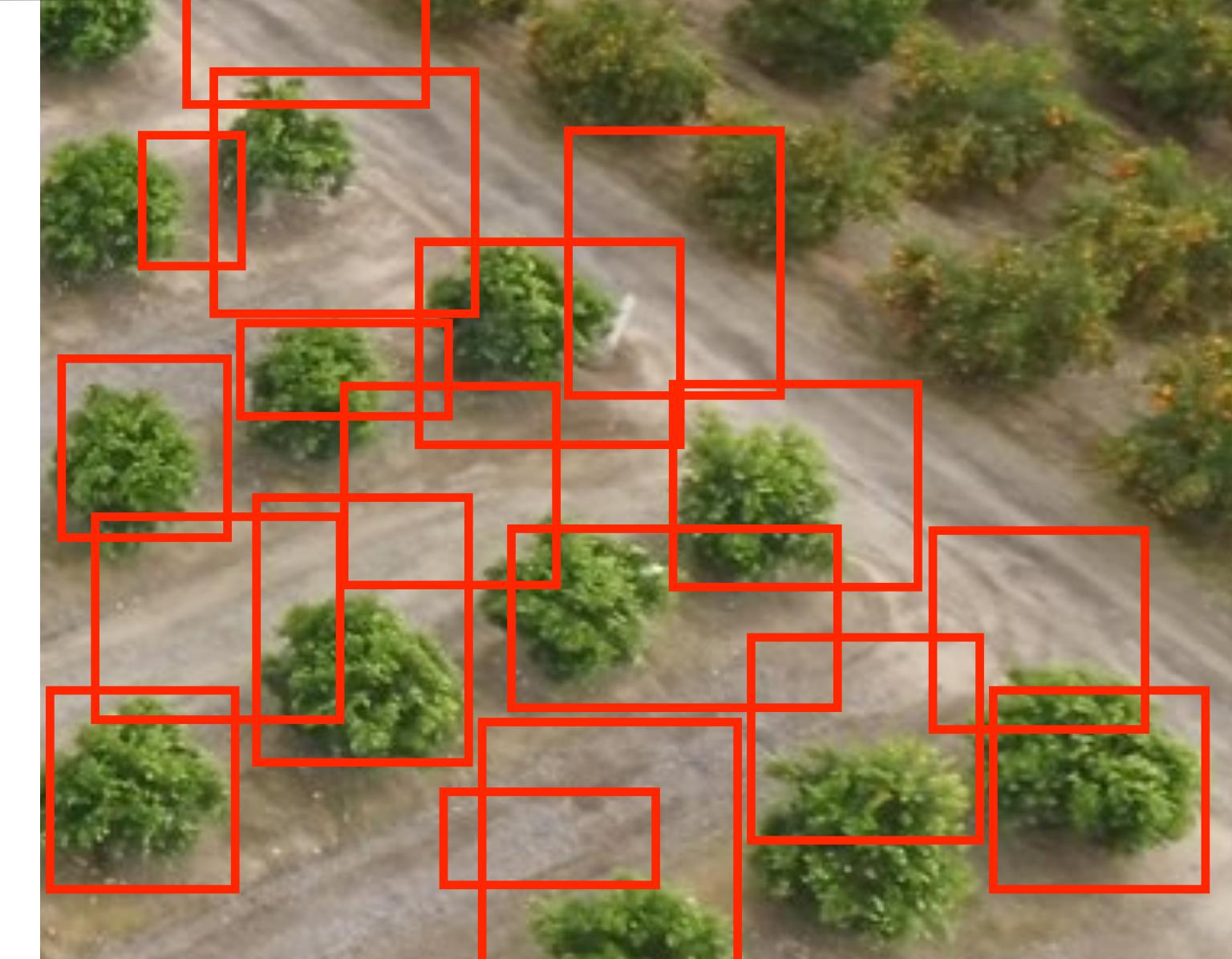
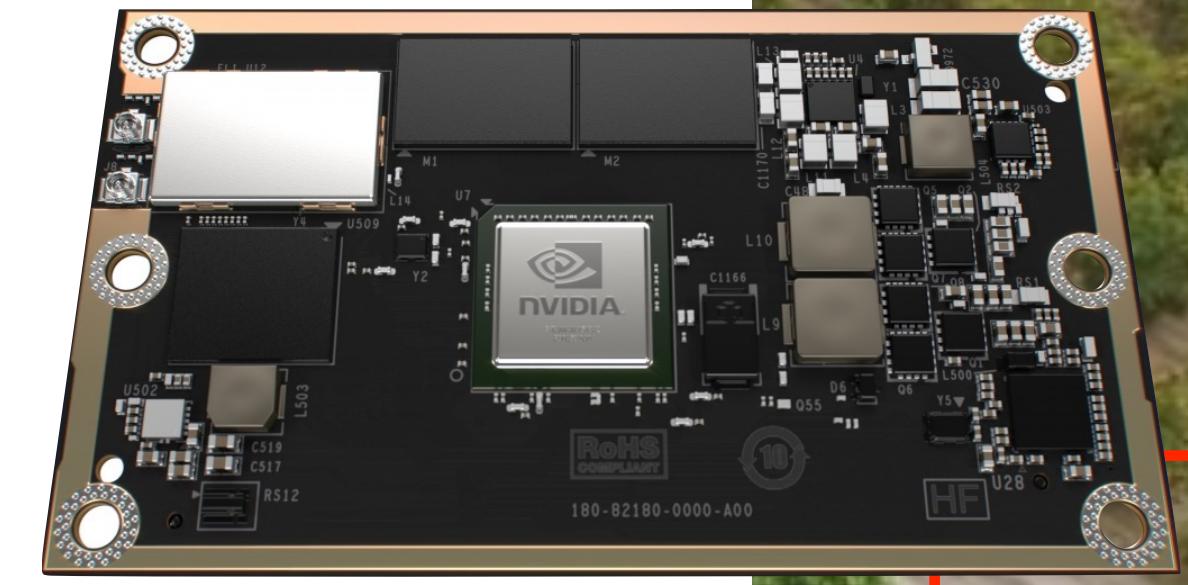
Data



Train



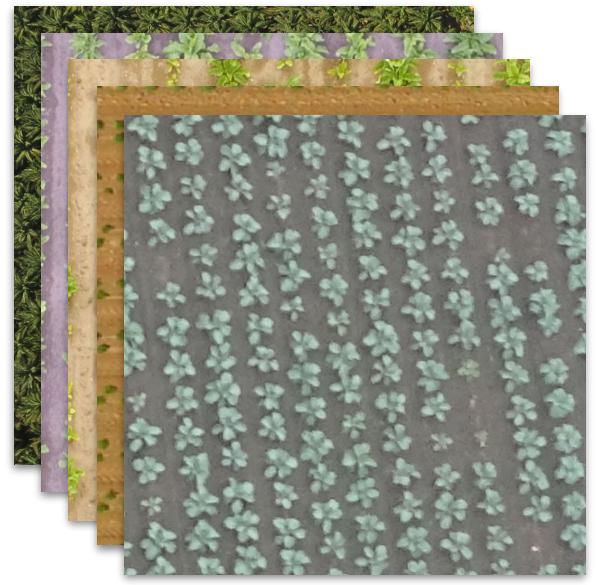
Deploy



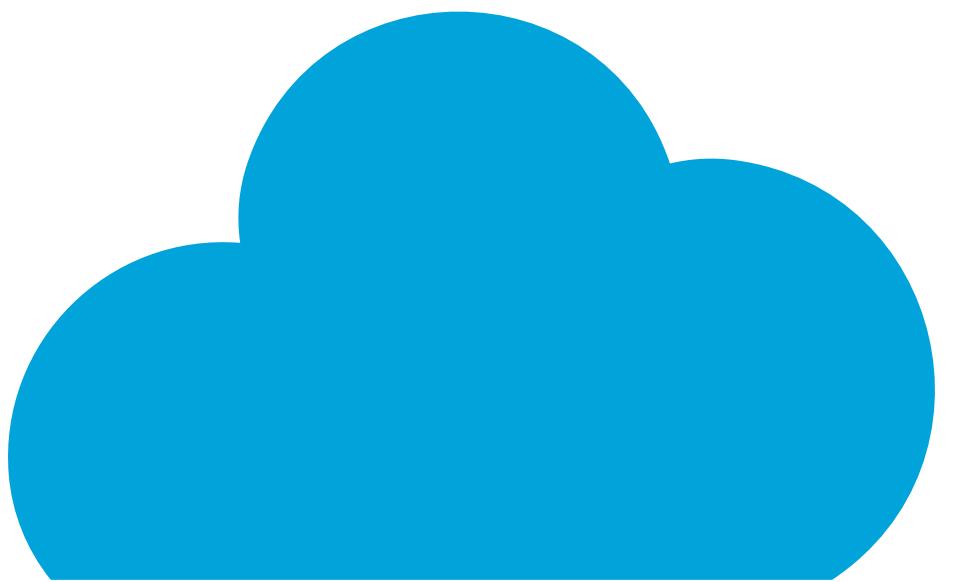
Reality



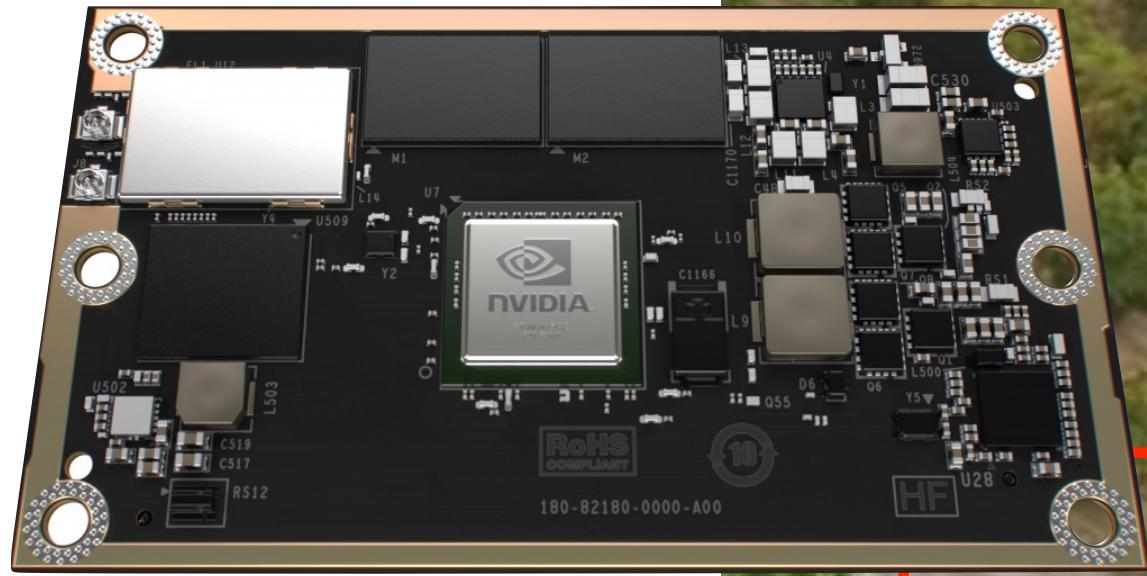
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Annotate



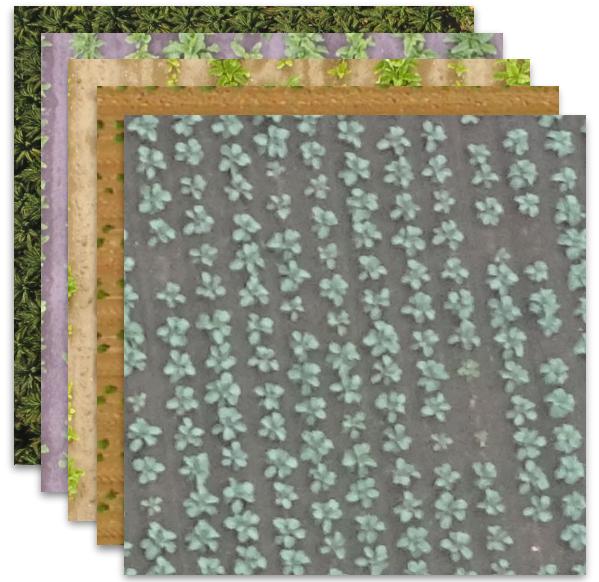
Upload data



Fine-tuning



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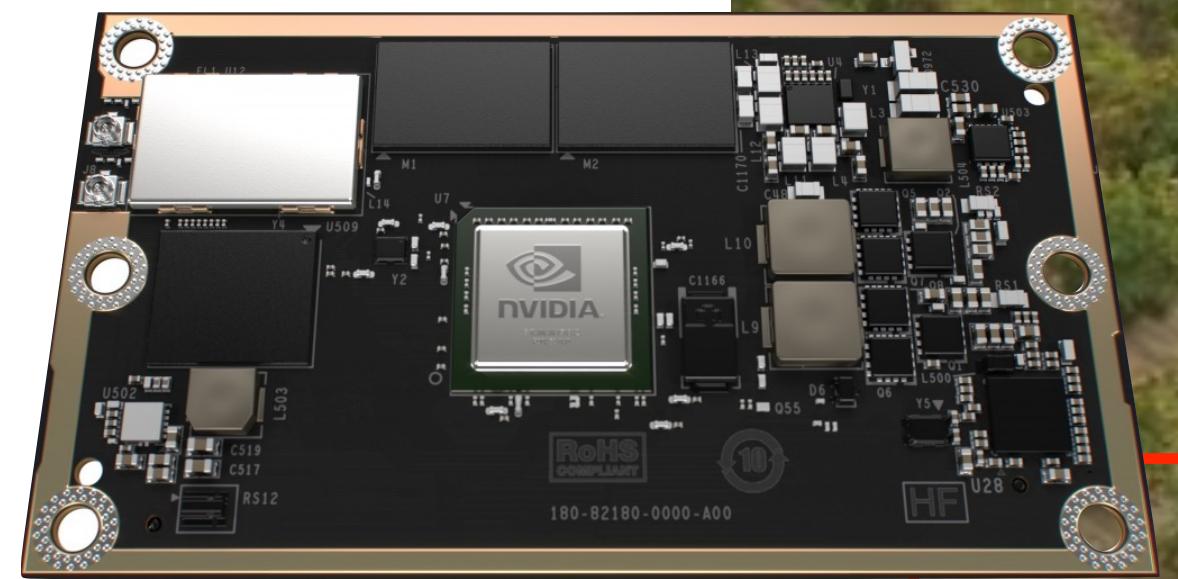
Annotate



Upload data

Fine-tune

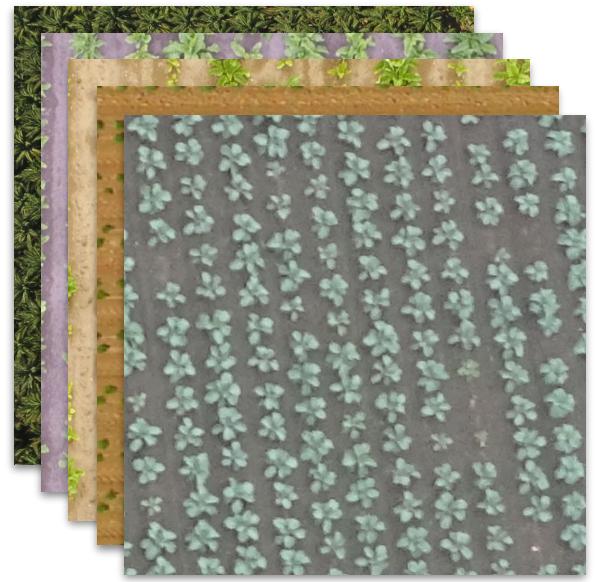
Deploy



Fine-tuning



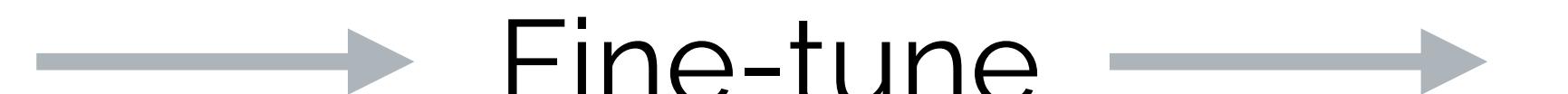
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Annotate



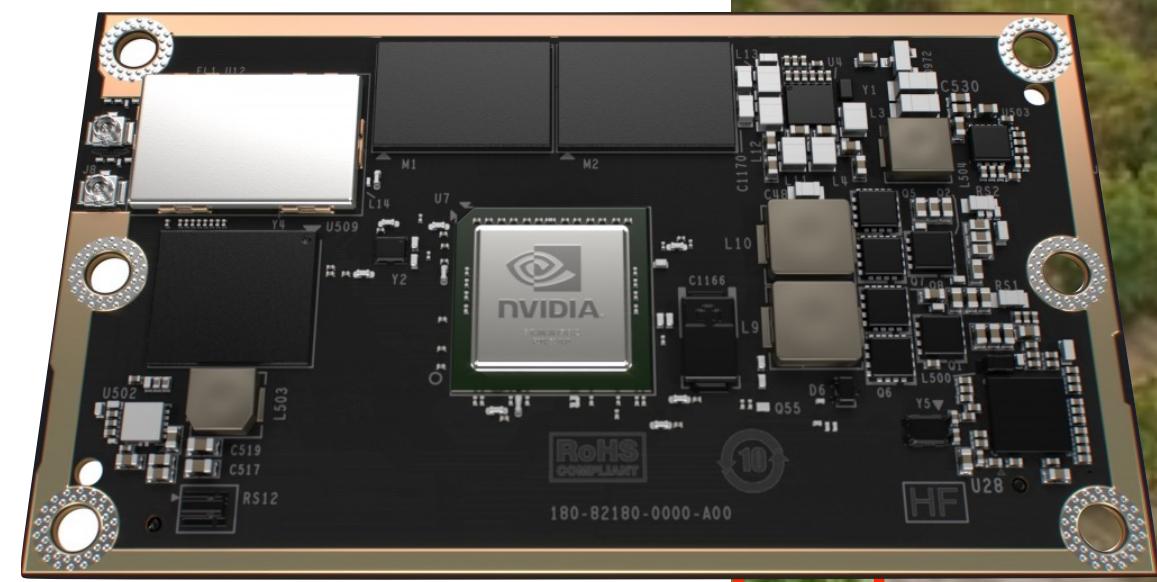
Upload data



Fine-tune



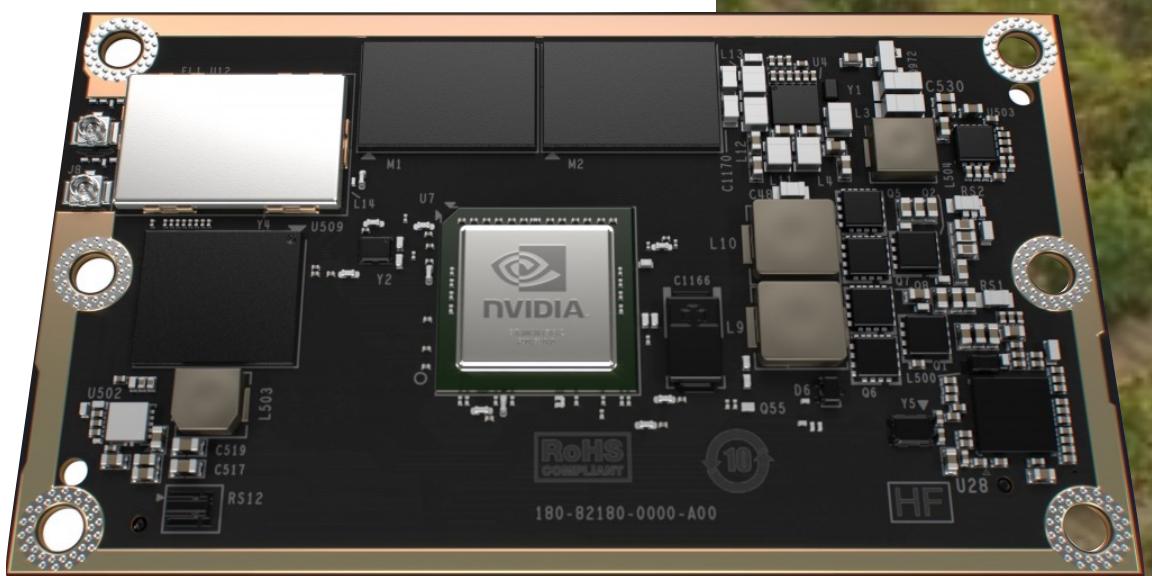
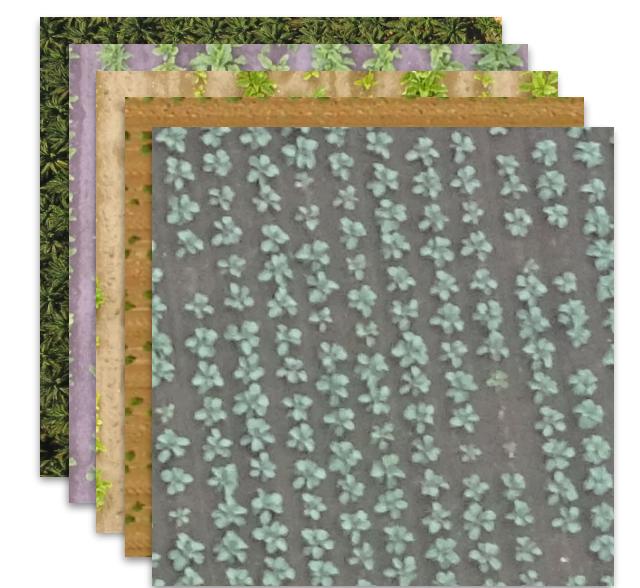
Deploy



Fine-tuning



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- Annotate
- Fine-tune
- Deploy



Fine-tuning
on the fly!



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Object Detection

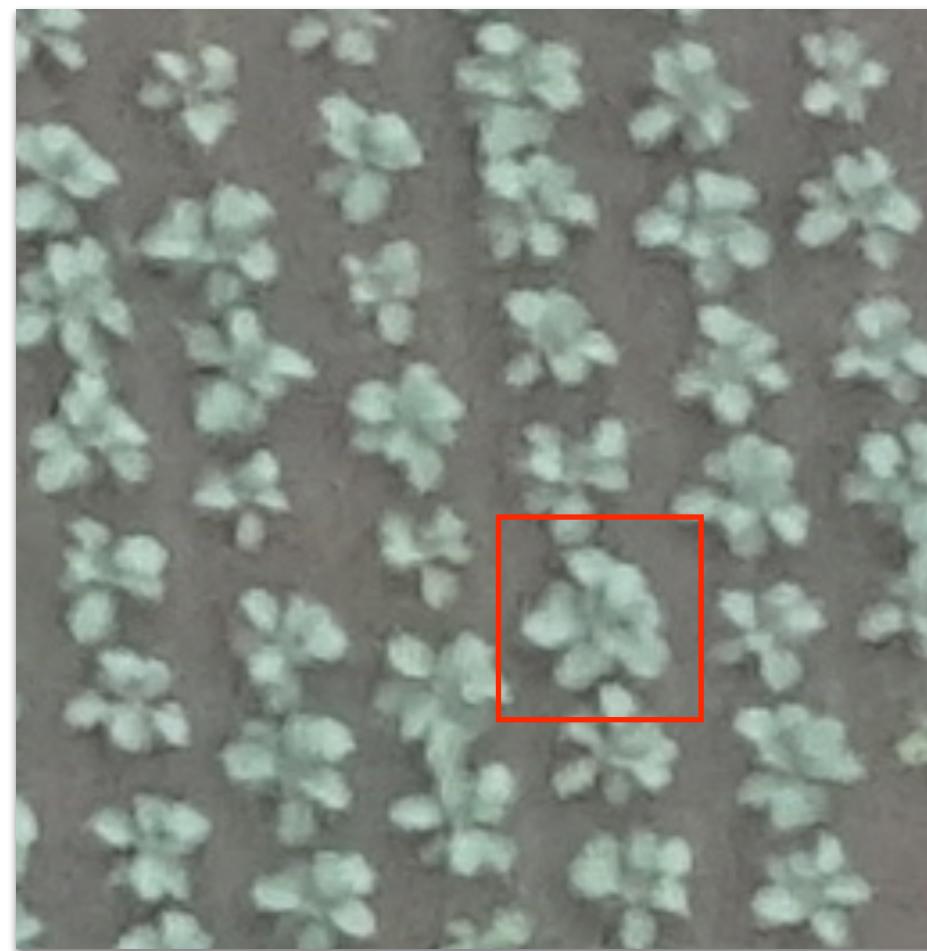


Image with Roi

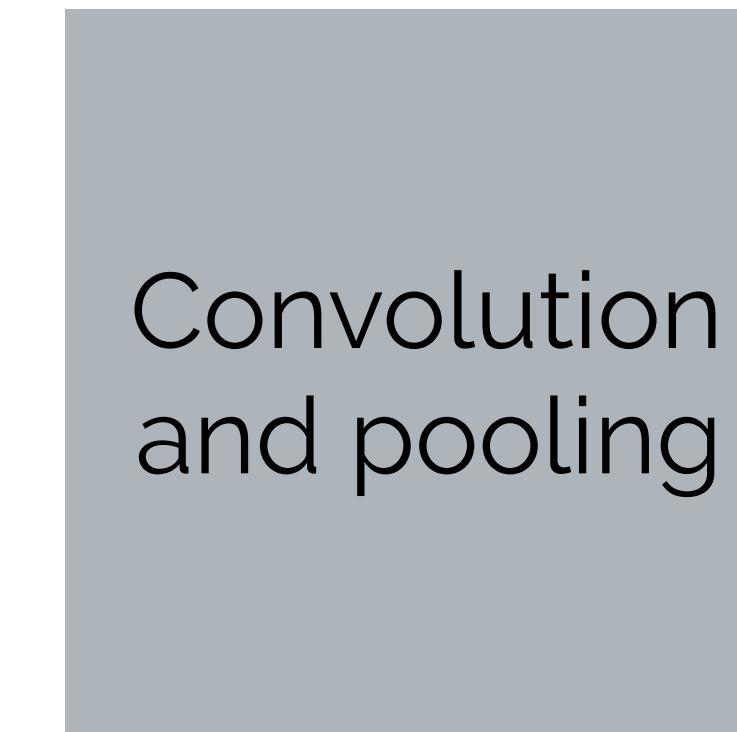
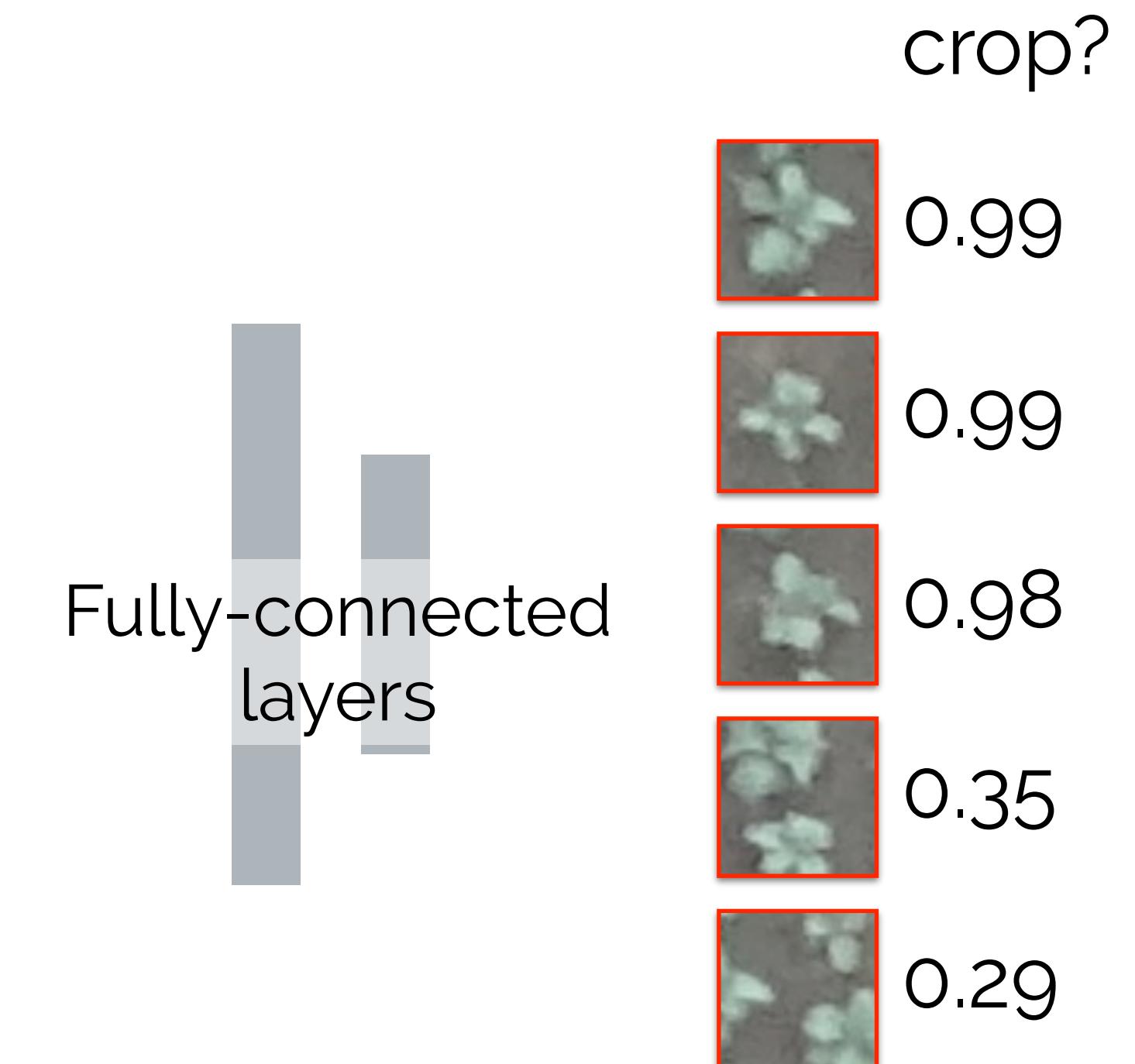
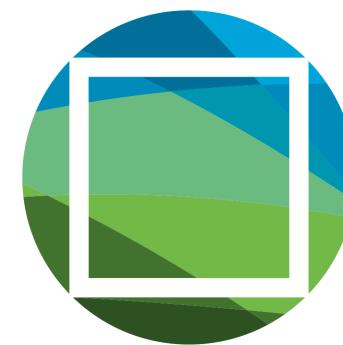


Image
conv features

Roi conv
Features



[1] Girshick, R.: Fast r-cnn. In: Proceedings of the IEEE International Conference on Computer Vision. (2015) 1440–1448



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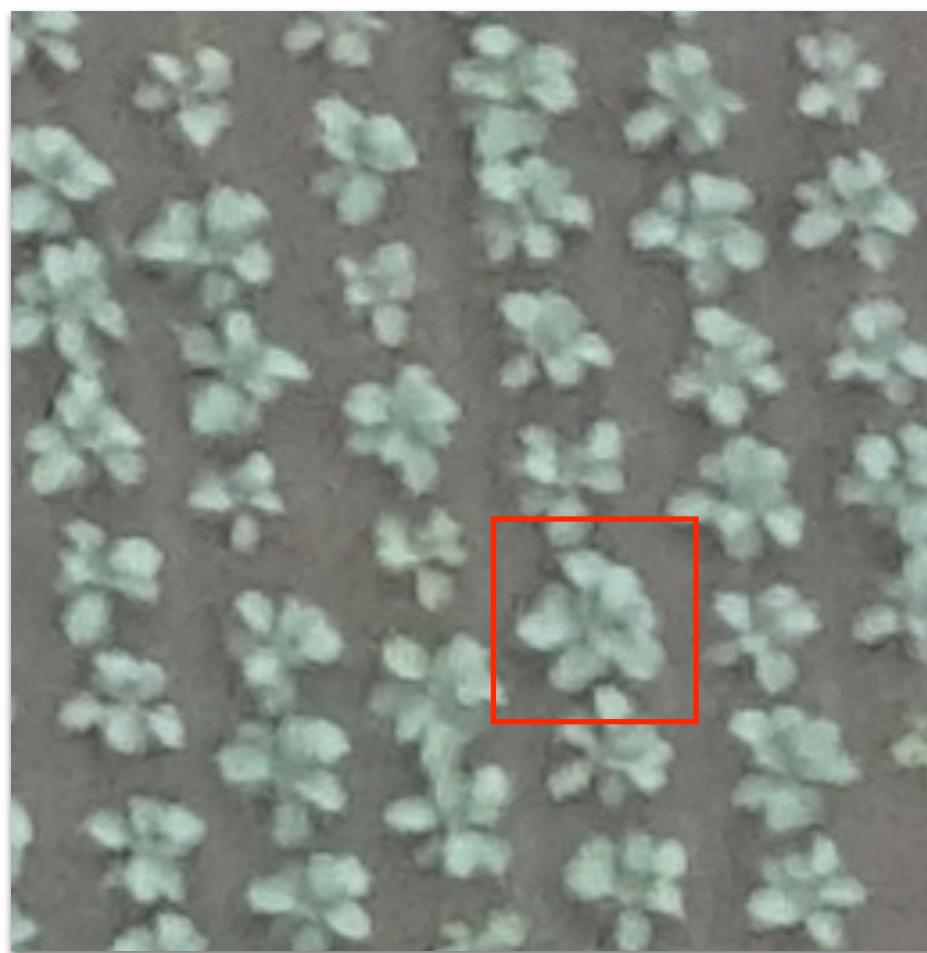
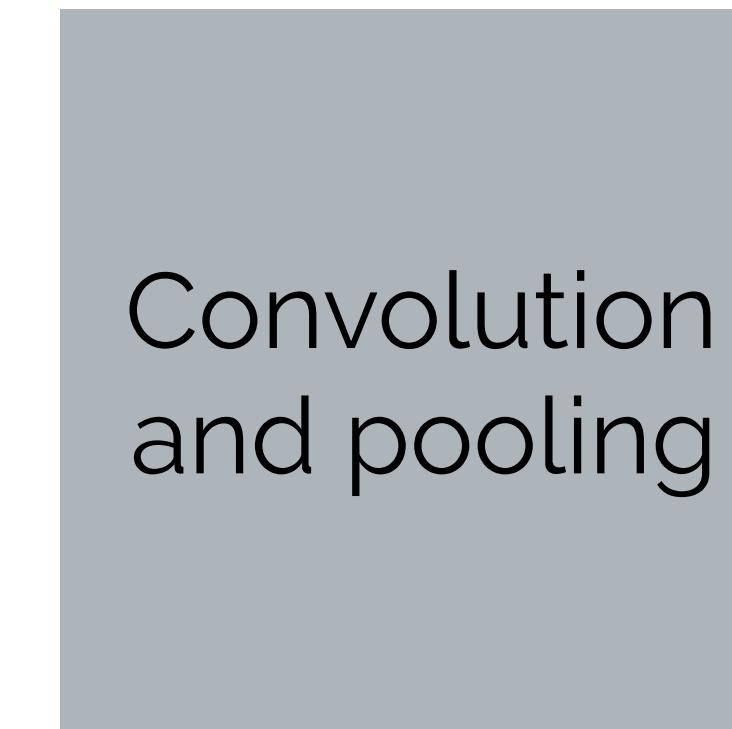


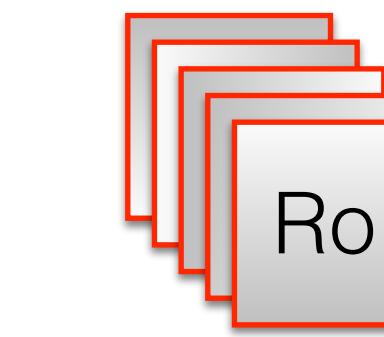
Image with Rols



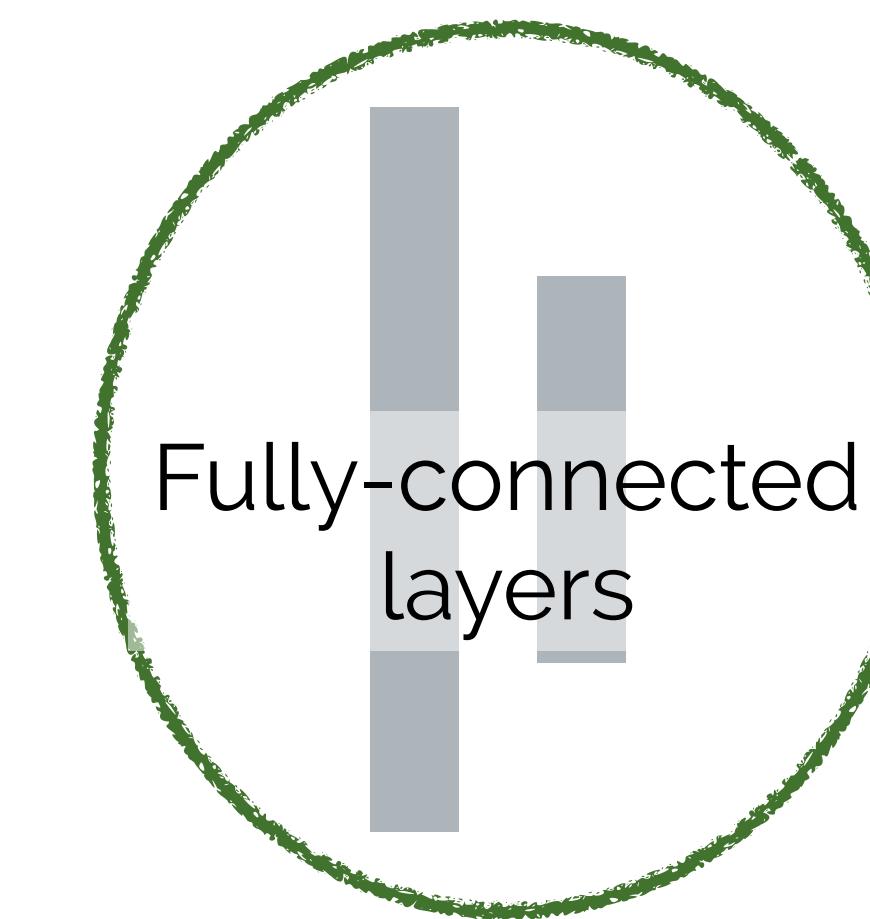
Convolution
and pooling



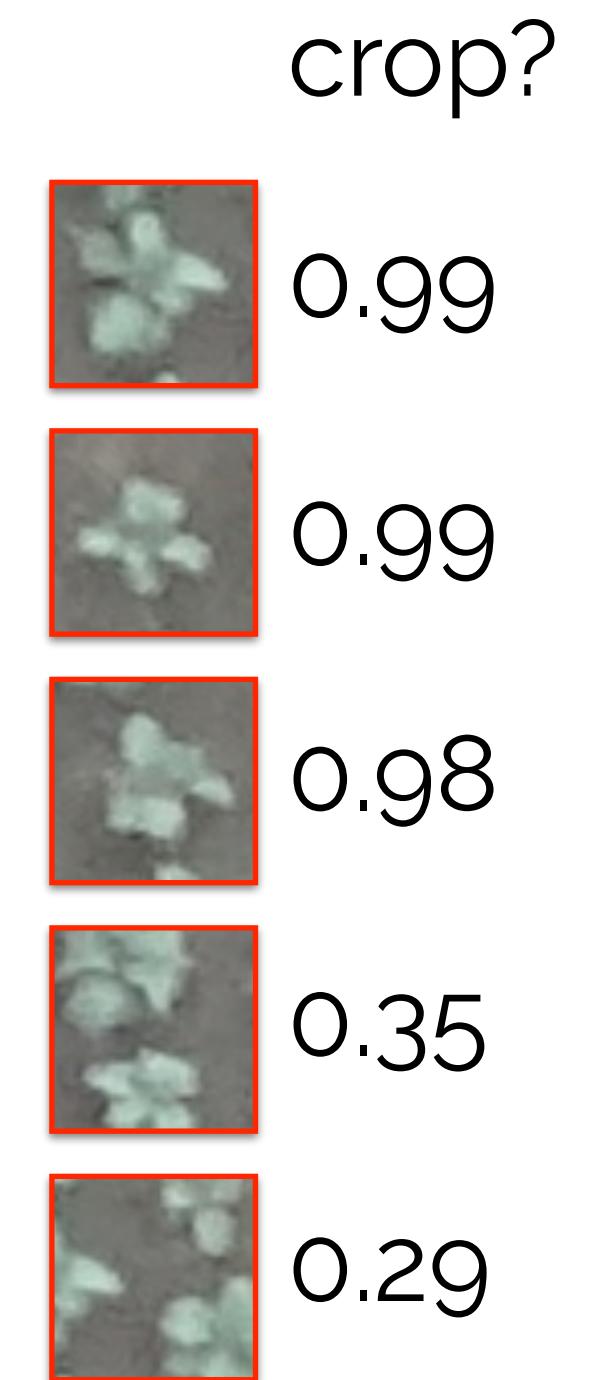
Image
conv features



Rol conv
Features



Fully-connected
layers

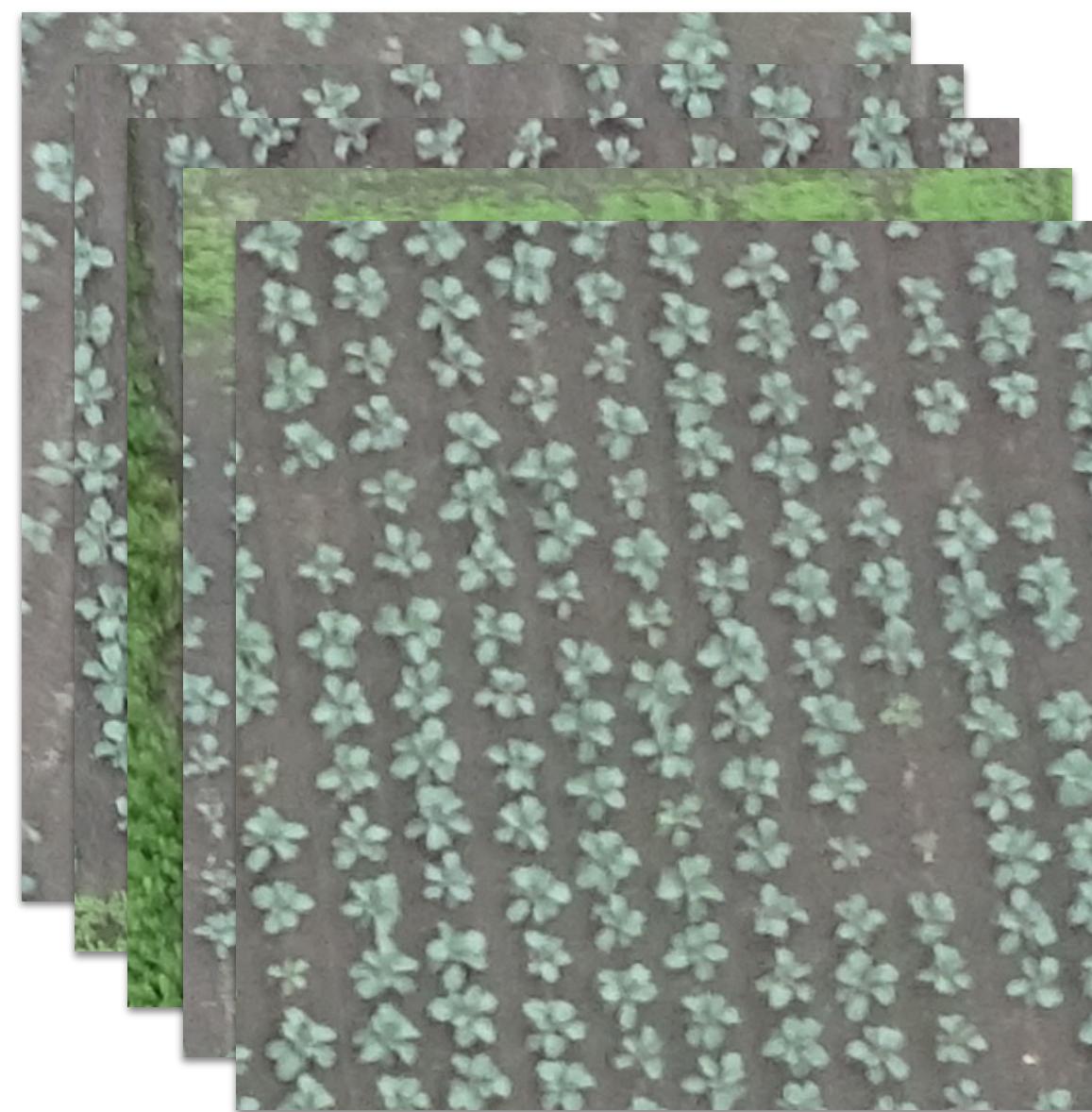


Fine-tuning



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Experimental setup Round 1



annotate 5 images

fine-tune



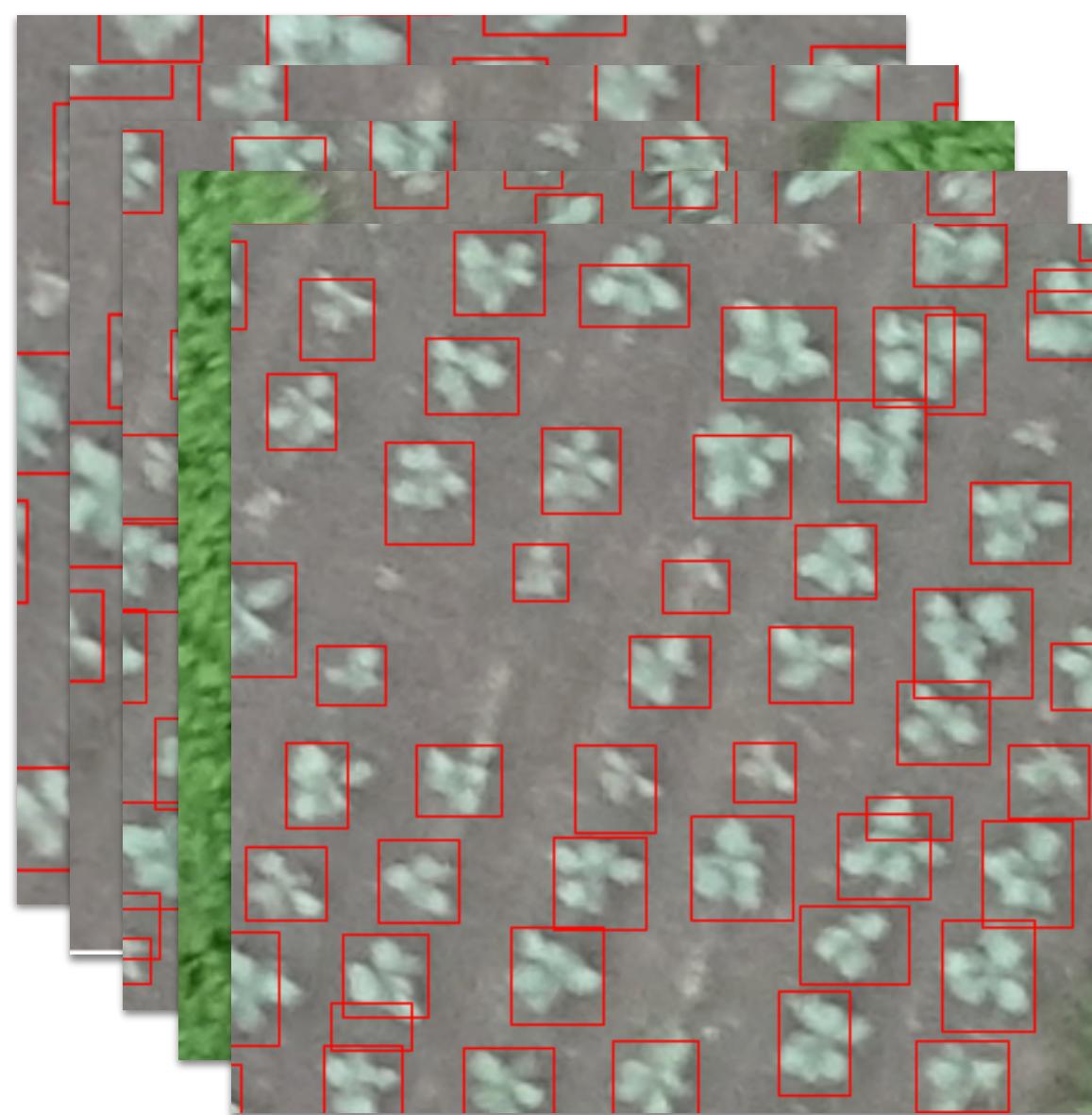
evaluate





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Experimental setup Round 2



fine-tune
→



Fully-connected
layers

evaluate
→



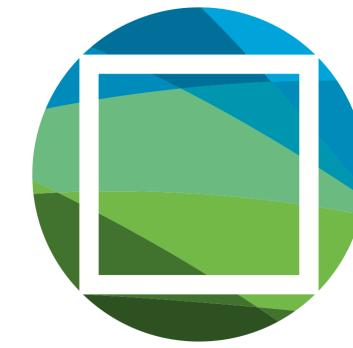
correct 5 images



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Annotation tool

Demo

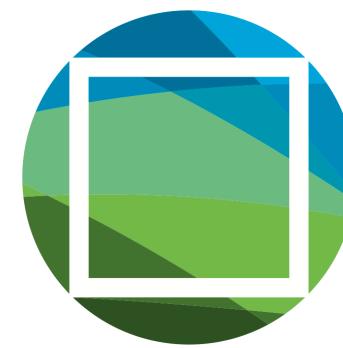


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Annotation tool

Birds.ai Previous all Next all Validate all Delete all Quick Look Fixed Label Box on a click box size Delete mode Request Detections



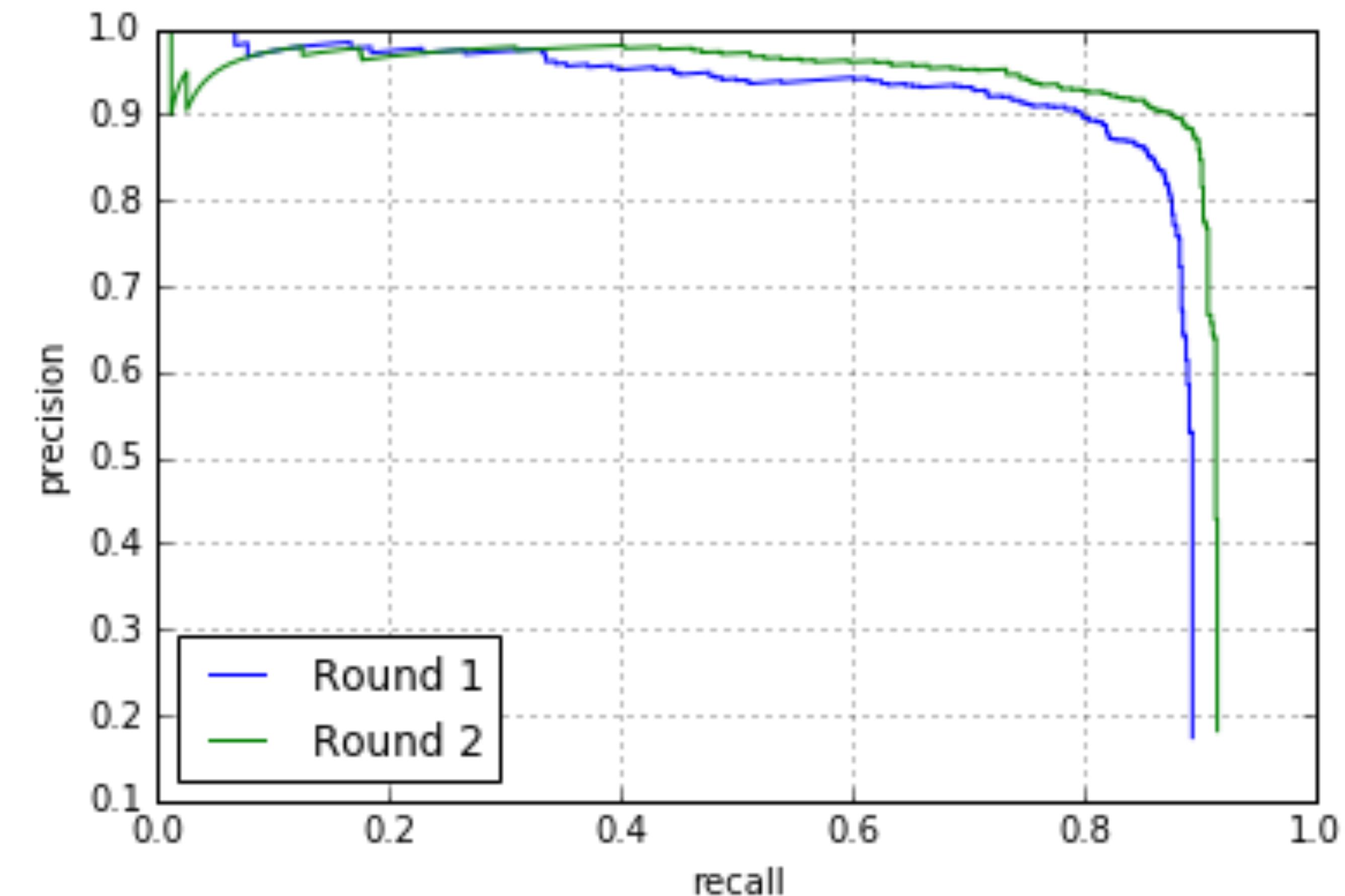


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Results

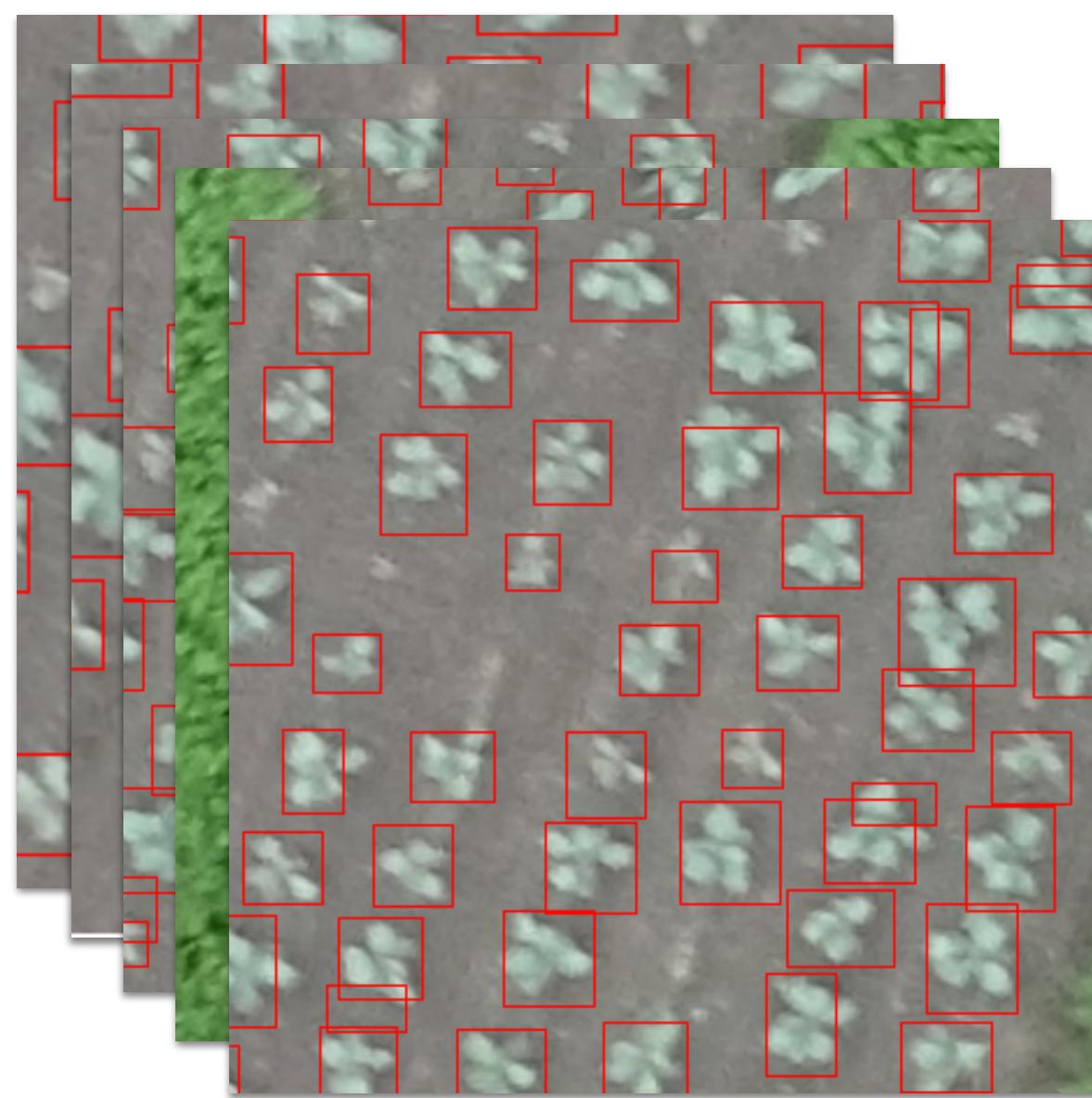
	Round 1	Round 2
AP	0.84	0.88
Recall	0.89	0.92

+ 0.04 average precision
+ 0.03 recall
in < 5 minutes

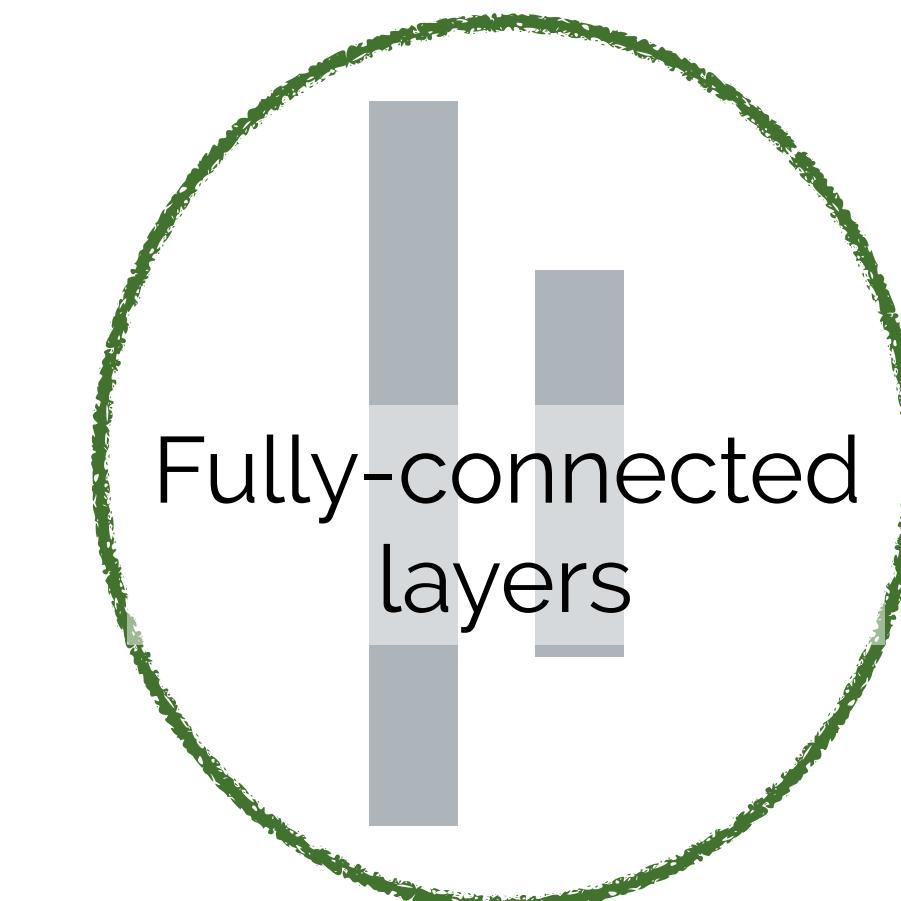




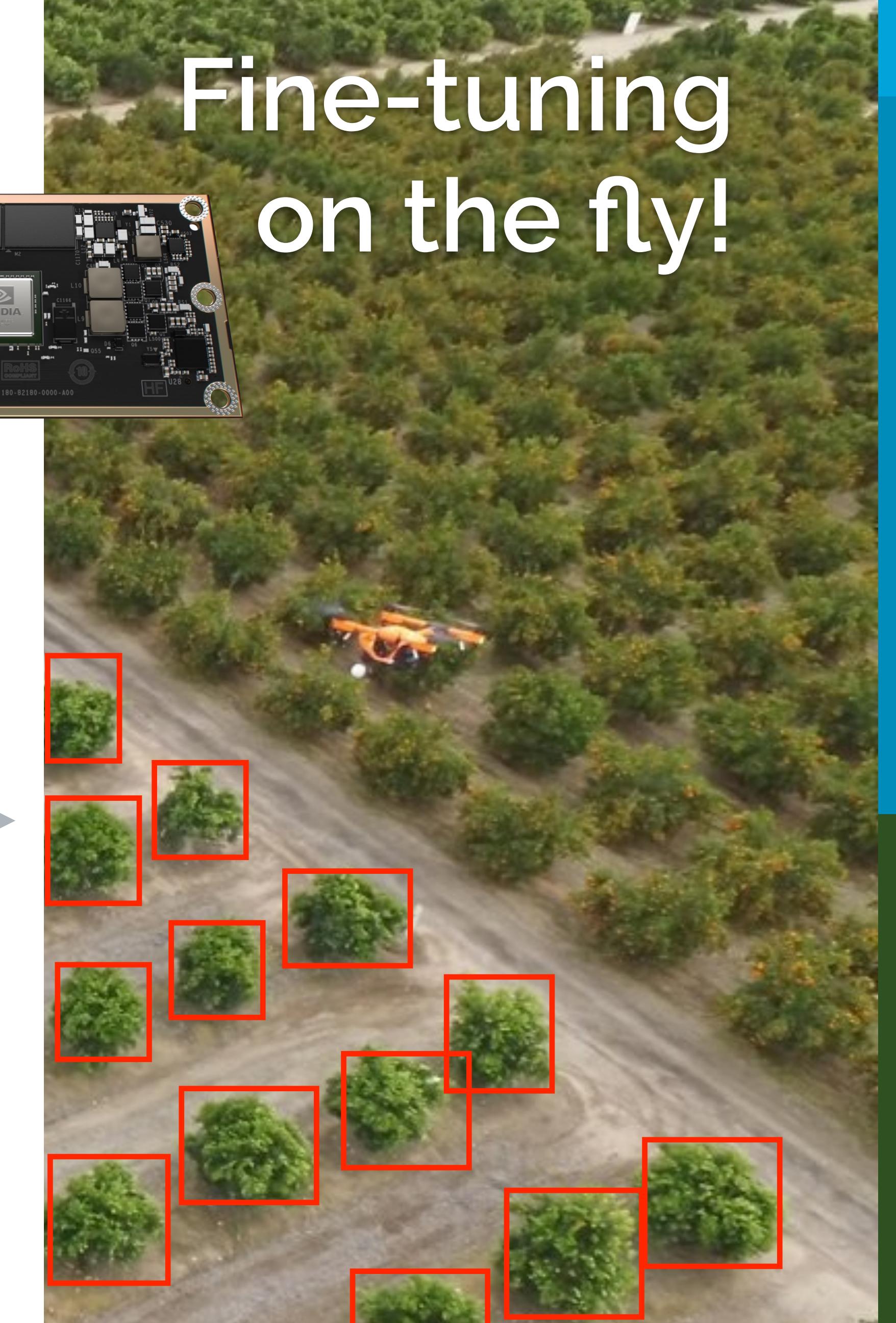
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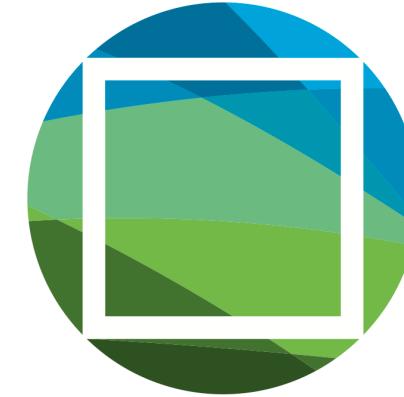


fine-tune
→



deploy
→





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