

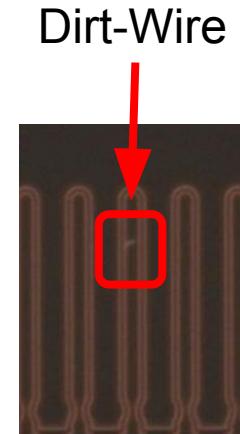
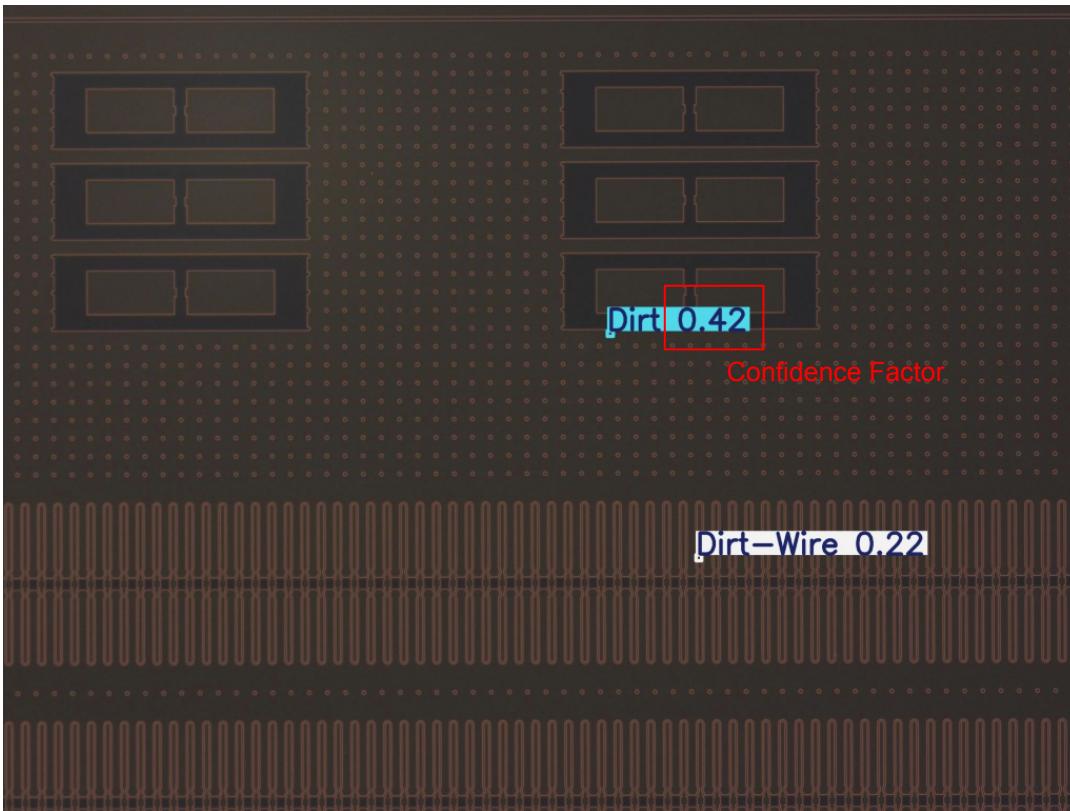
Progress Dec 1

ML4Science - Defects Detection

Recap - Manual labelling (Dirt, Dirt-Wire, Burn and Open)



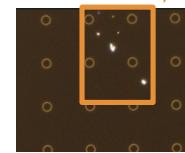
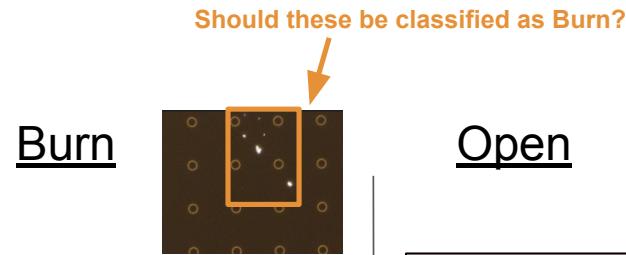
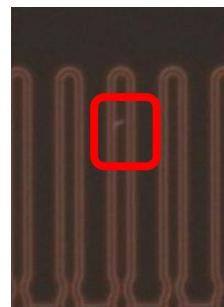
Recap - Model Predictions



Goals

- ❑ Discuss the current results.
- ❑ Decide the exact name of the defect-types before relabelling.
- ❑ Technicalities
- ❑ Novelty

Defect-Types (Previous Version)

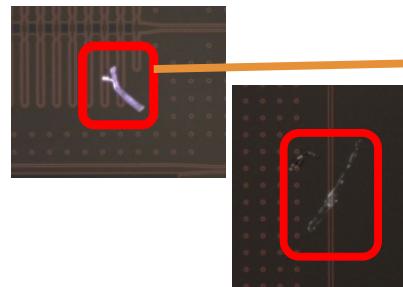


Open

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Should also be
classified as Open?



Defect-Types (Our suggestion)

Dirt

classify as Dirt instead of Burn
(fabrication team?)

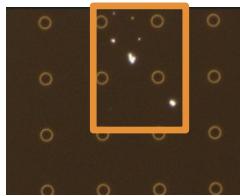
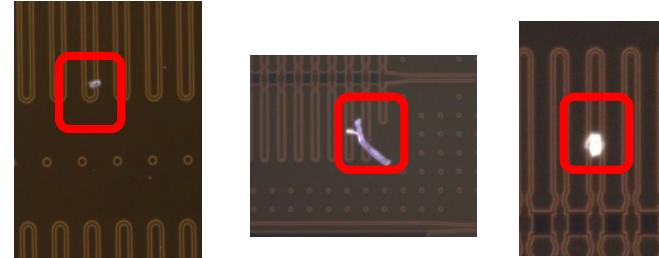
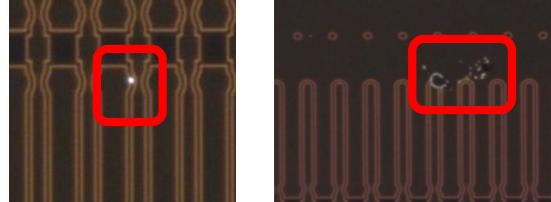


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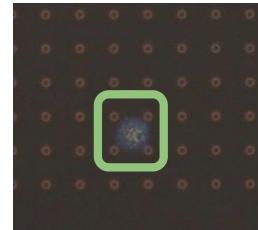
Critical

"label all features that are directly on the "wire" as critical..."



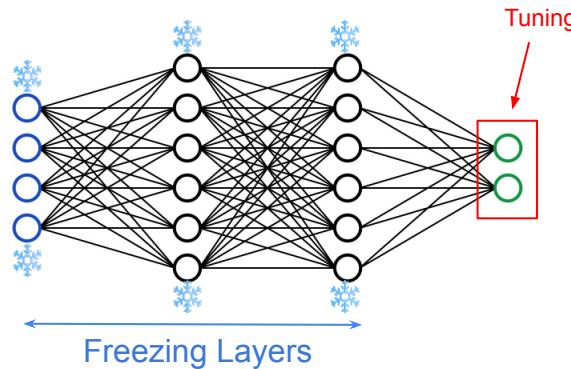
Burn

only when it's burned and it's not on the "wire"



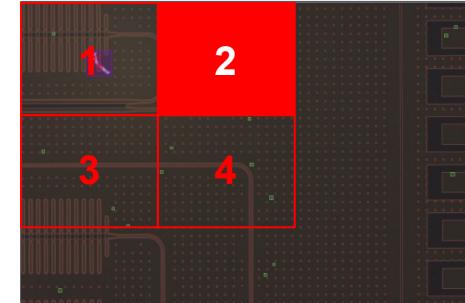
GPU Bottleneck

Last Layer Training:



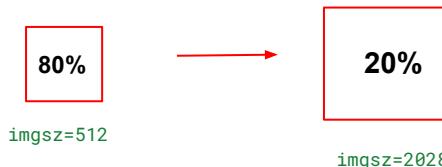
Tiling Input:

Smaller Input Size



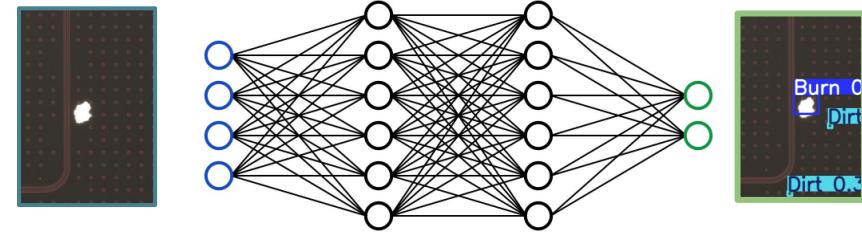
GPU Bottleneck

Two-stages Training:



Pre-Trained Model:

Starting from a Model that already knows some representations

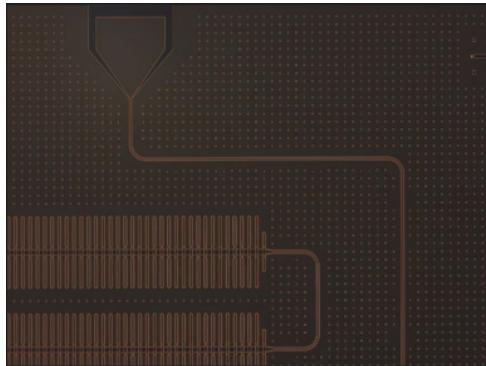


Source: OpenAI CLIP paper -> can significantly boost our mAP (Mean Average Precision).

Recap - Training with Data Augmentation

Training input:

All our labels are in one layout, so
we augment the data



e.g: Clipping, Colours, ...



Generate diverse samples

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Generalization

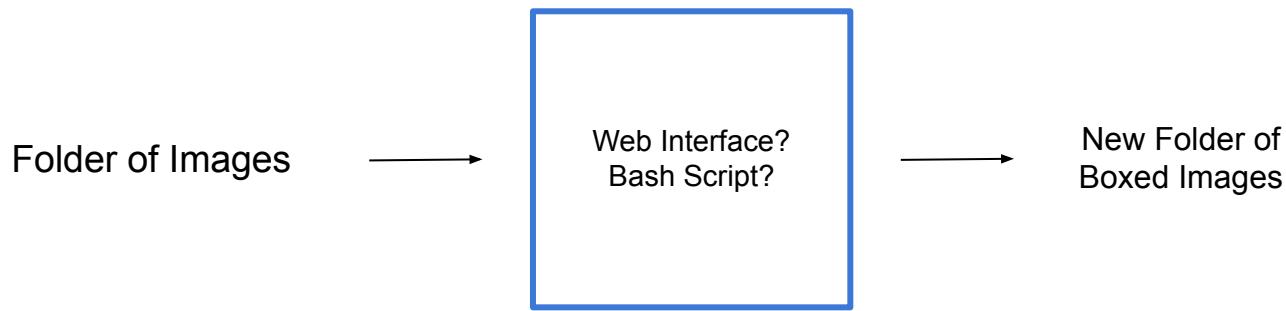
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We need to increase the diversity of our labeled data, to generalise for these examples

Final Result



Challenges

- ❑ Labelling is tedious...
- ❑ Novelty and project evaluation...
 - Create all the models from scratch even though we don't have GPU power.
- ❑ GPU Bottleneck
- ❑ Models Decision