

Approaches V1

▼ Status	To be done today
☰ Category	Grad School
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What are the problems

1. class imbalance
 - a. Combining classes - good vs bad → template matching
2. no samples of drift in training
 - a. Autoencoder for anomaly detection - struggle to recreate → drift

Many formulations, let's write a few down

1. Keep training as it is, add blurs and shakes to create drift class. train 1 classifier for all 6 classes
2. Combine all defect classes together. add drift. train a classifier to output → good, defect, drift. then use template matching to correctly classify defects.
3. Train 4 separate models based on the part / cut of interest. repeat 2 but for 4 separate models.
4. In all the above, instead of a drift class, first train anomaly detection algo like autoencoder, to see if we can eliminate some obvious drifts beforehand

Model selection:

Model	Pros	Cons
EfficientNet-B0	Best balance of accuracy & speed, works on low-res images .	Slightly larger than MobileNet.
MobileNetV3	Fastest & smallest, great for real-time defect detection .	Slightly lower accuracy.
ResNet-18	Stable and interpretable , works well on 128×128 .	Not as optimized as EfficientNet.
ViT (Vision Transformer)	Best for complex defect textures .	Needs more data than CNNs.