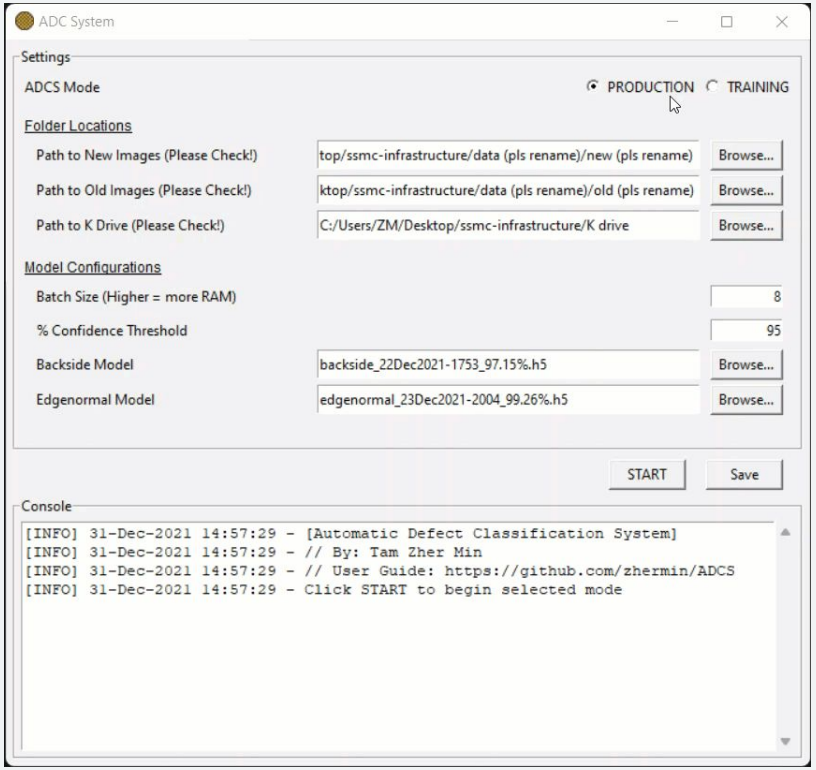
ADCS

Automatic Defect Classification System

By: Tam Zher Min
Email: tamzhermin@gmail.com
User Guide: https://github.com/zhermin/ADCS



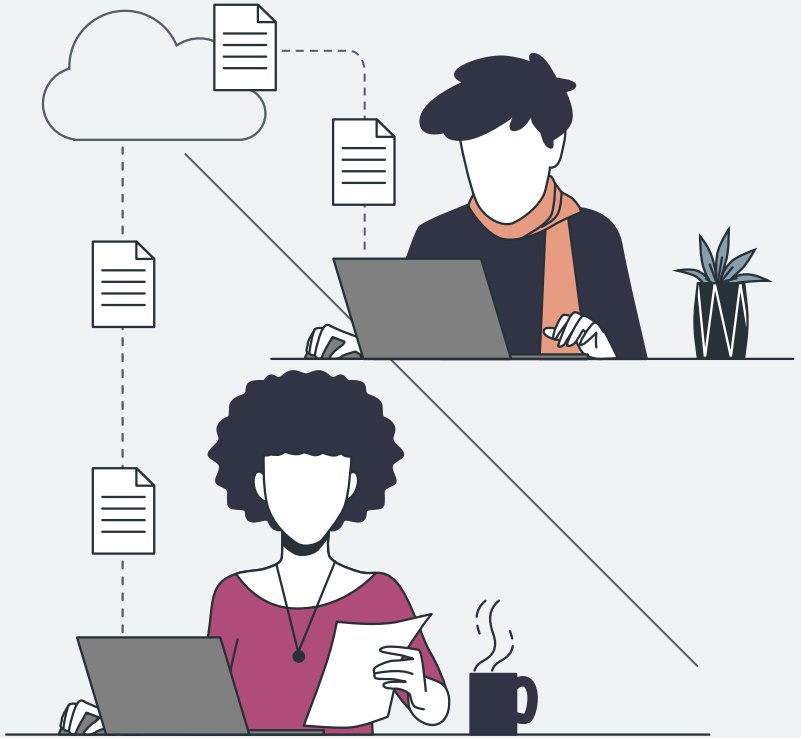
ADCS Summary

- ADCS finds all KLA files and wafer scans from AVI machine in the “New” folder
- ADCS then looks at all of the images and **classifies** them
- At the end, ADCS will move the KLA files and scans to the correct folders
    1. Copy only **scans with defects** (ignore AOK and edgetops) to “K Drive”
    2. Move **all scans** to “Old” folder for backup
- Operator will only need to manage the backup folder and **sort the scans**

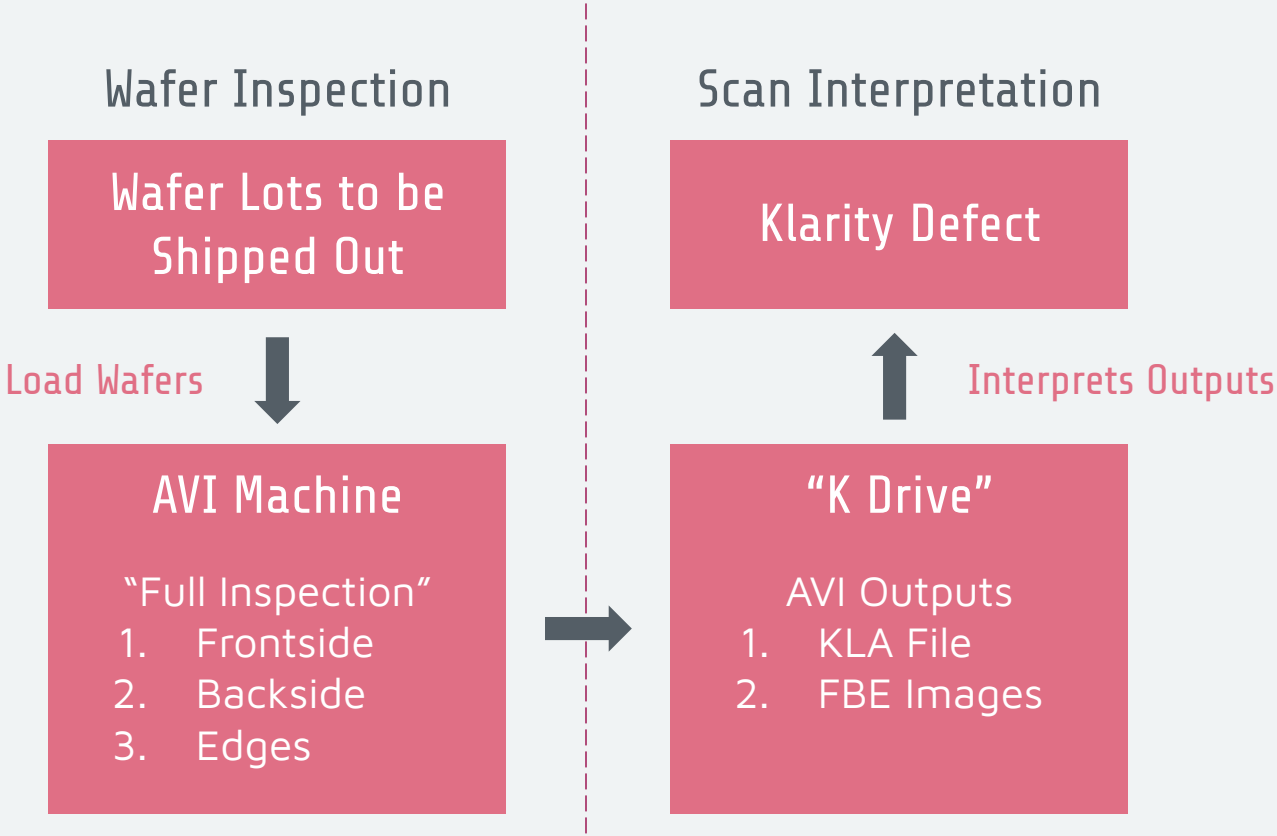
01

Data Flow

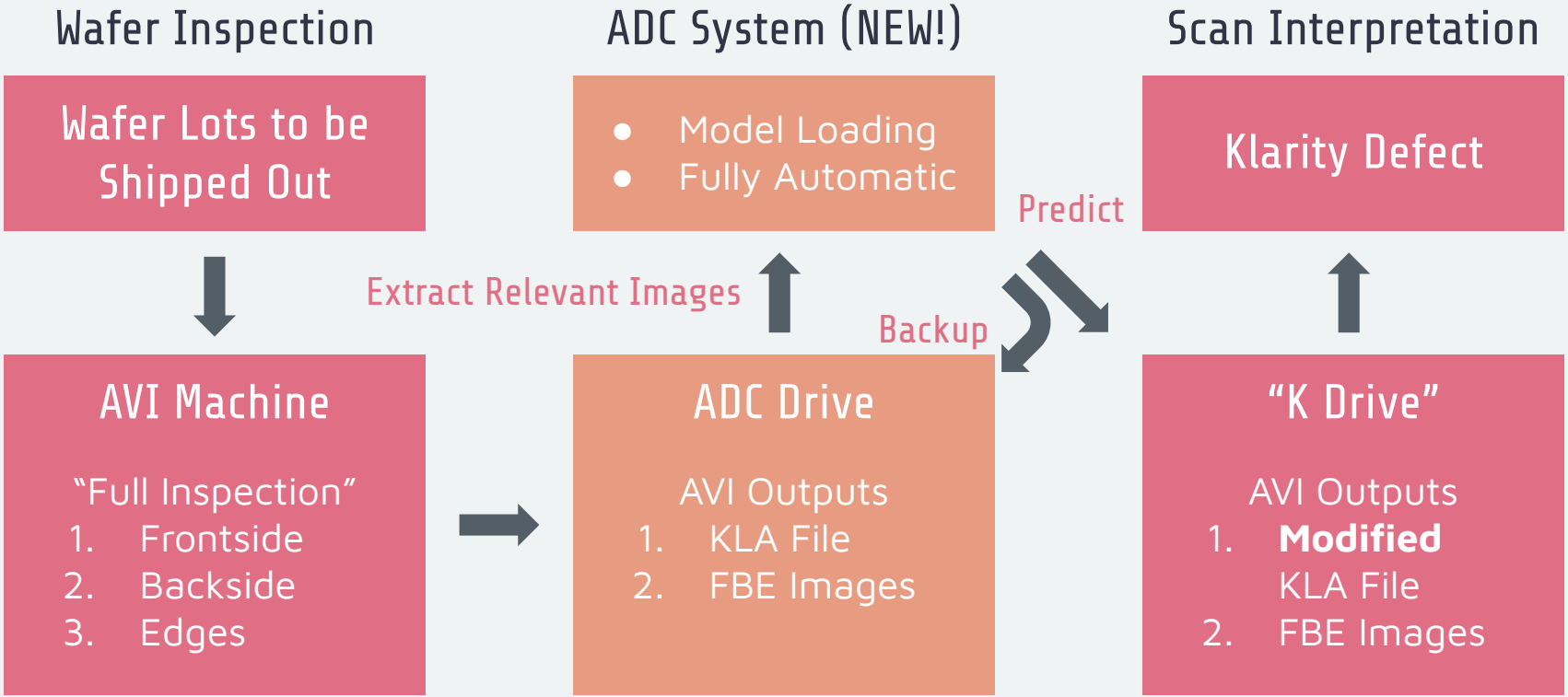
Flow of KLA files
and wafer scans



Current State



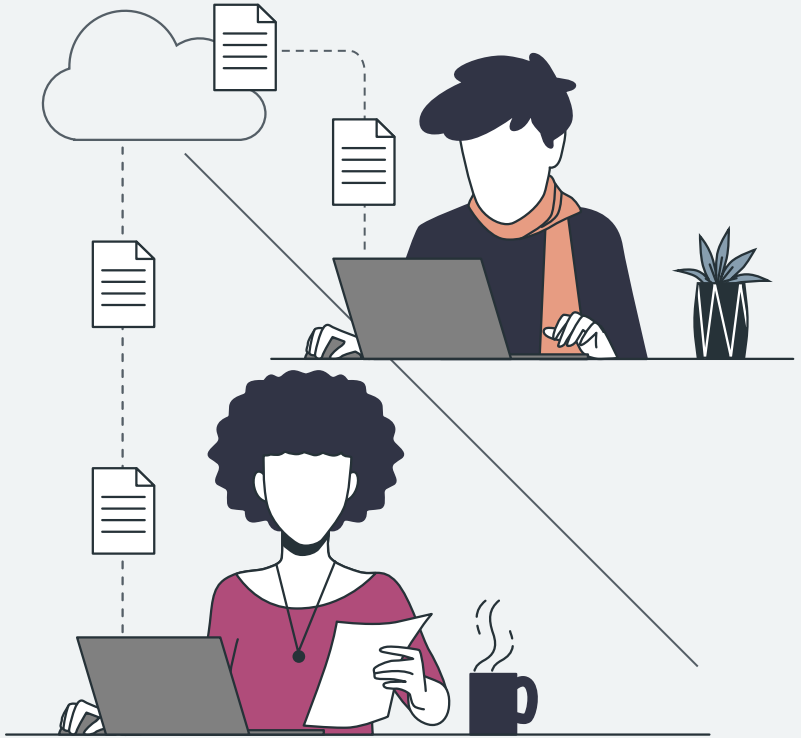
Future State with ADCS



02

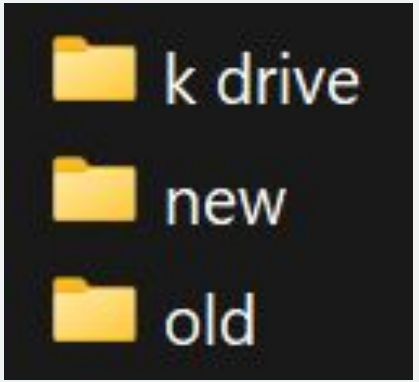
Sorting Guide

What to do after ADCS has classified the wafer scans



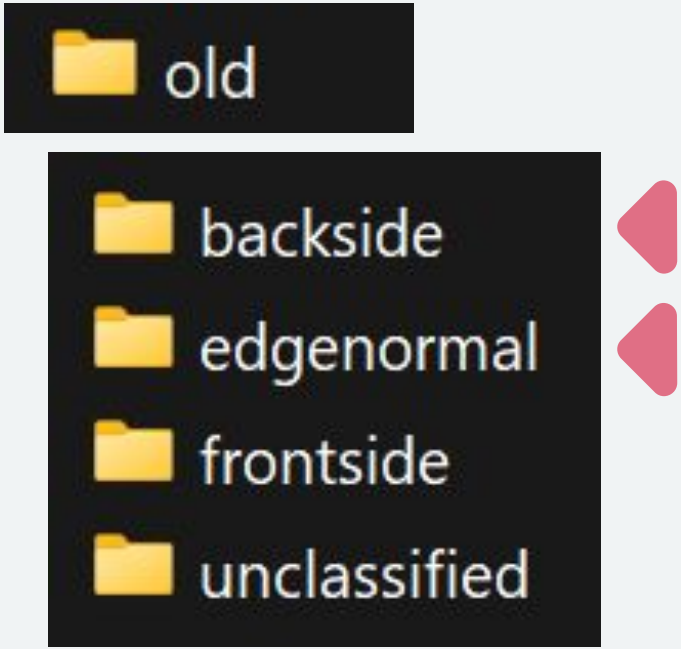
Step 1

- Go into the “old” folder, where the backups are stored
- You don’t have to access the “k drive” folder or “new” folder



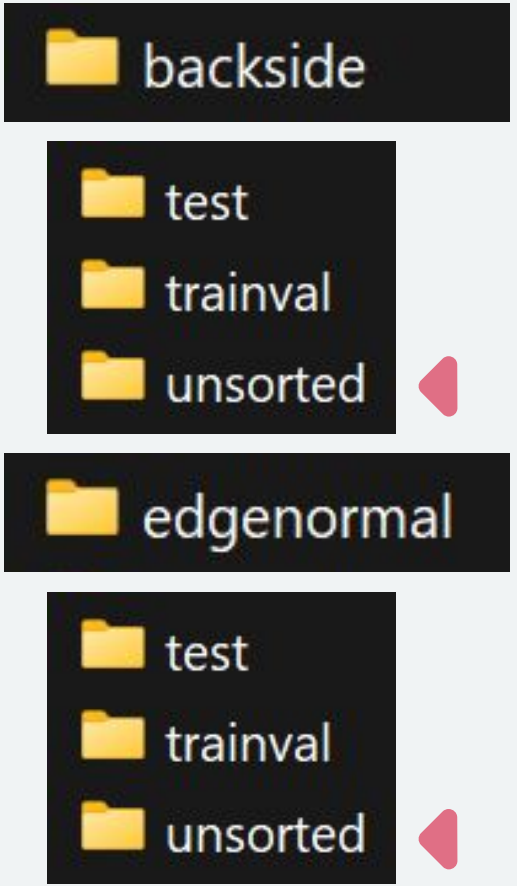
Step 2

- Inside the “old” folder will be 4 subfolders
    1. *backside (for backside scans)
    2. *edgenormal (for bevel edge scans only, no edge top)
    3. frontside (for frontside scans, they are ignored by the ADCS currently)
    4. unclassified (for wafer maps, edge top scans, or unknown classnumbers)



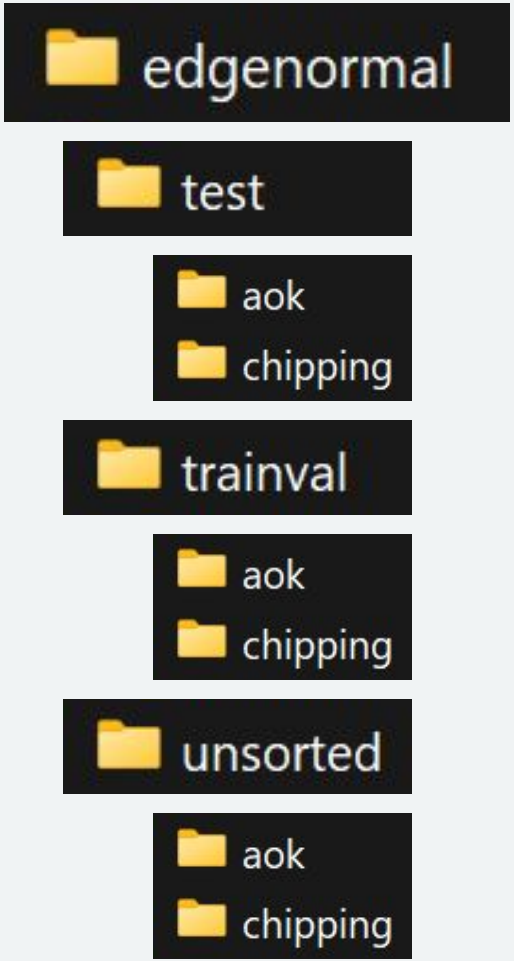
Step 3

- After the ADCS has completed classifying a wafer lot, look into the backside folder and edgenormal folder
- Both folders will have 3 subfolders
    1. test (20% of the unsorted images)
    2. trainval (80% of the unsorted images)
    3. unsorted (classified images will first be transferred into this folder, **your job is to sort the images inside this folder into the test and trainval folders**)



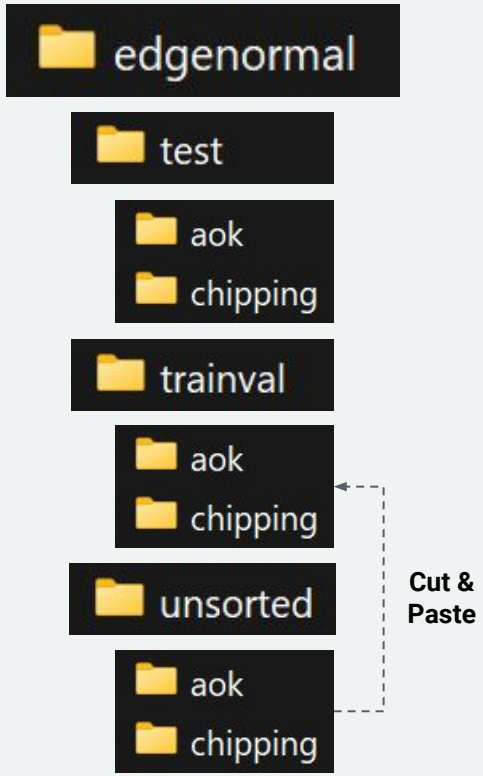
Step 4

- For edgenormal, there are 2 classes, so there will be **2 folders** inside **EACH of the 3 folders**
  1. aok (all-OK, normal image, no defects)
  2. chipping (bevel edge chipping)



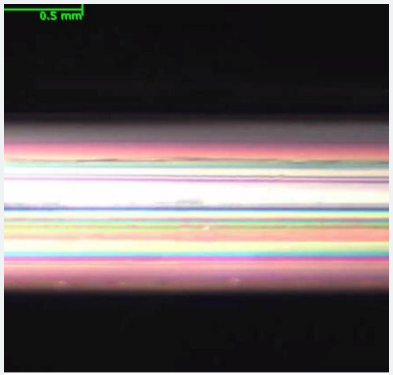
Step 5

- Check **each** of the defect folders for the wafer lots with defects
- Check if the classifications are correct or not
- After checking, **cut and paste** the images into the **CORRECT** trainval folder
    - Example, if some images from /unsorted/chipping have **no defects**, move them into **/trainval/aok** instead of /trainval/chipping

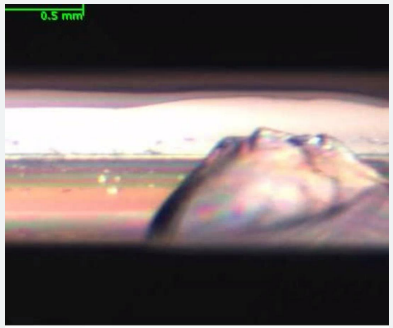


Edgenormal Classes (2)

[0] AOK

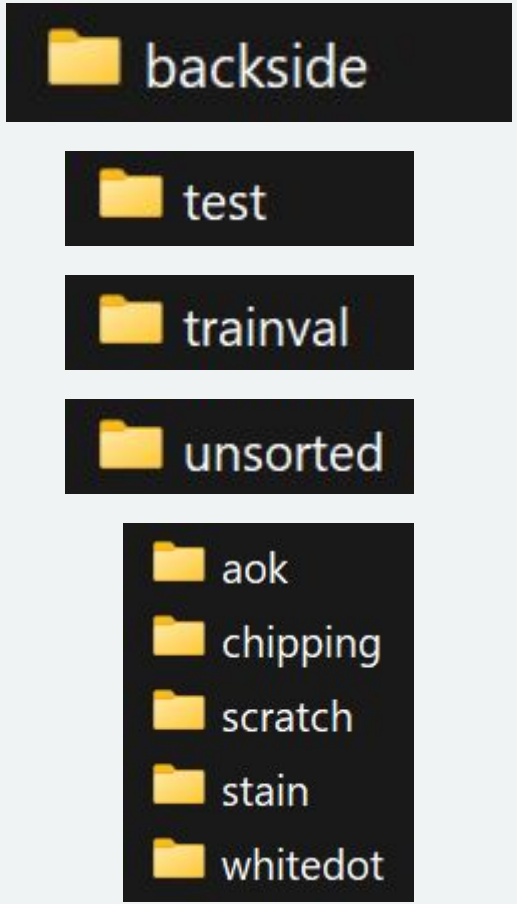


[1] CHIPPING



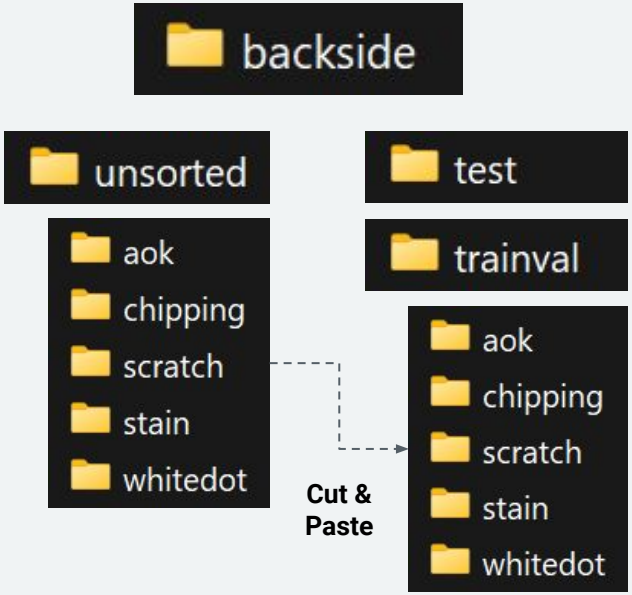
Step 4a

- For backside, there are 5 classes, so there will be **5 folders** inside **EACH of the 3 folders**
  1. aok (all-OK, normal image, no defects)
  2. chipping (backside chipping)
  3. scratch (cat-claw)
  4. stain (discoloration, peeling, or probe marks)
  5. whitedot (one whitedot on wafer backside)



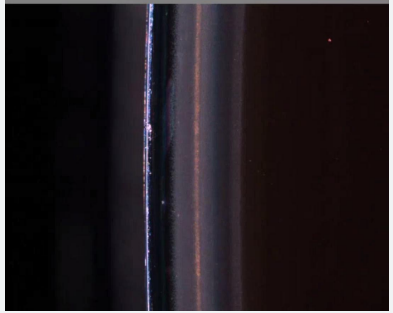
Step 5a

- Check **each** of the defect folders for the wafer lots with defects
- Check if the classifications are correct or not
- After checking, **cut and paste** the images into the **CORRECT** trainval folder
    - Example, if some images from /unsorted/stain have **no defects**, move them into **/trainval/aok** instead of /trainval/stain

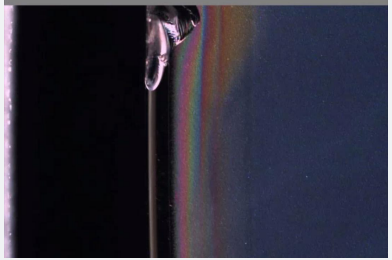


Backside Classes (5)

[0] AOK

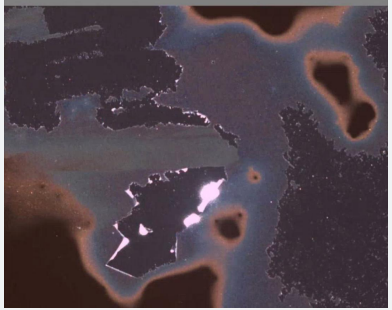


[1] CHIPPING



[2] SCRATCH

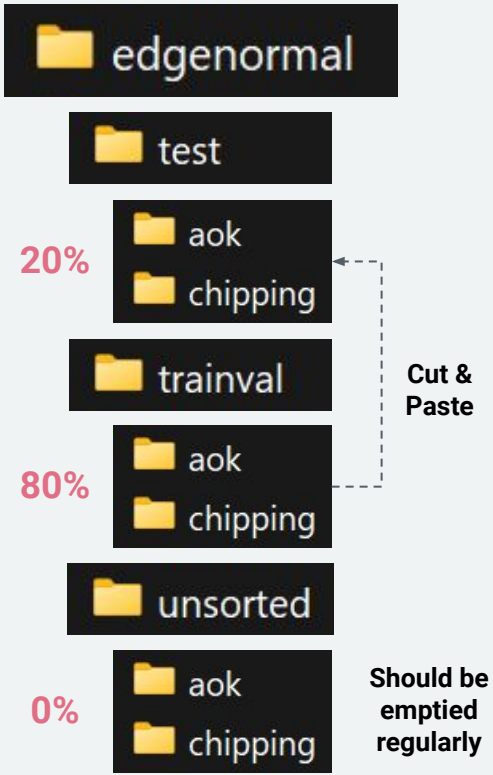
[3] STAIN



[4] WHITEDOT

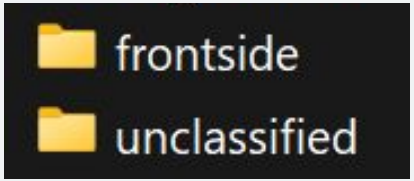
Step 6

- In the end, all folders in the unsorted folder for backside and edgenormal folders should be **empty**
- But, the trainval folder should grow over time
- The test folder should receive **20%** of the images from the trainval folder before **model training** is done (ADCS' Training Mode)



Step 7

- For the frontside and unclassified folders, you may leave them alone because they are ignored by the back and edge models
- However, both folders will **grow over time**, so you may consider periodically deleting images that are unimportant to **save space**



Can consider clearing them to save space after checking

Step 8 (optional)

- The classification results are also stored in table format as Excel files
- Found in **/ADCS/results/production/backside** & …**/production/edgenormal**