



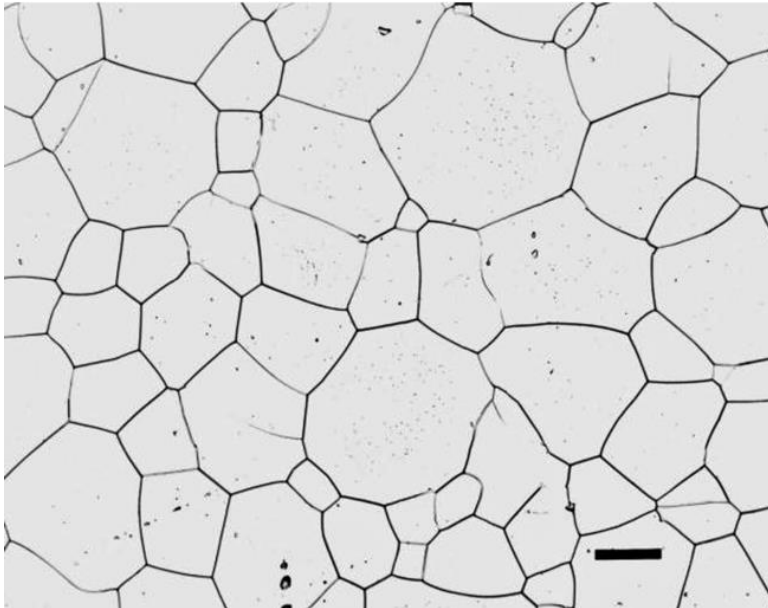
CS231N Spring 2022

# CNN-based Grain Size Determination of Microscopy Images

Jingchao Zhang  
Stanford Center for Professional Development  
Stanford University  
jingchao@stanford.edu

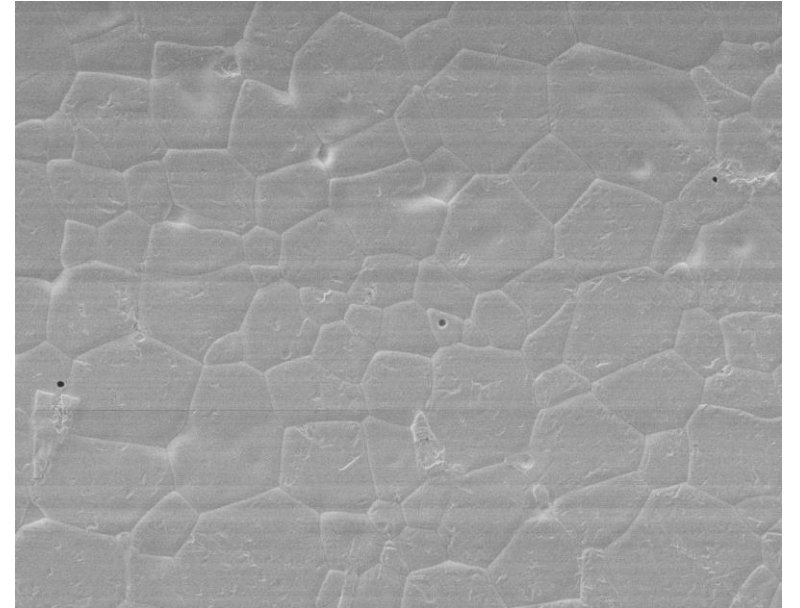
## Grain Size Plays an Important Role in Material Properties

- Thermal
- Mechanical
- Electrical
- Optical

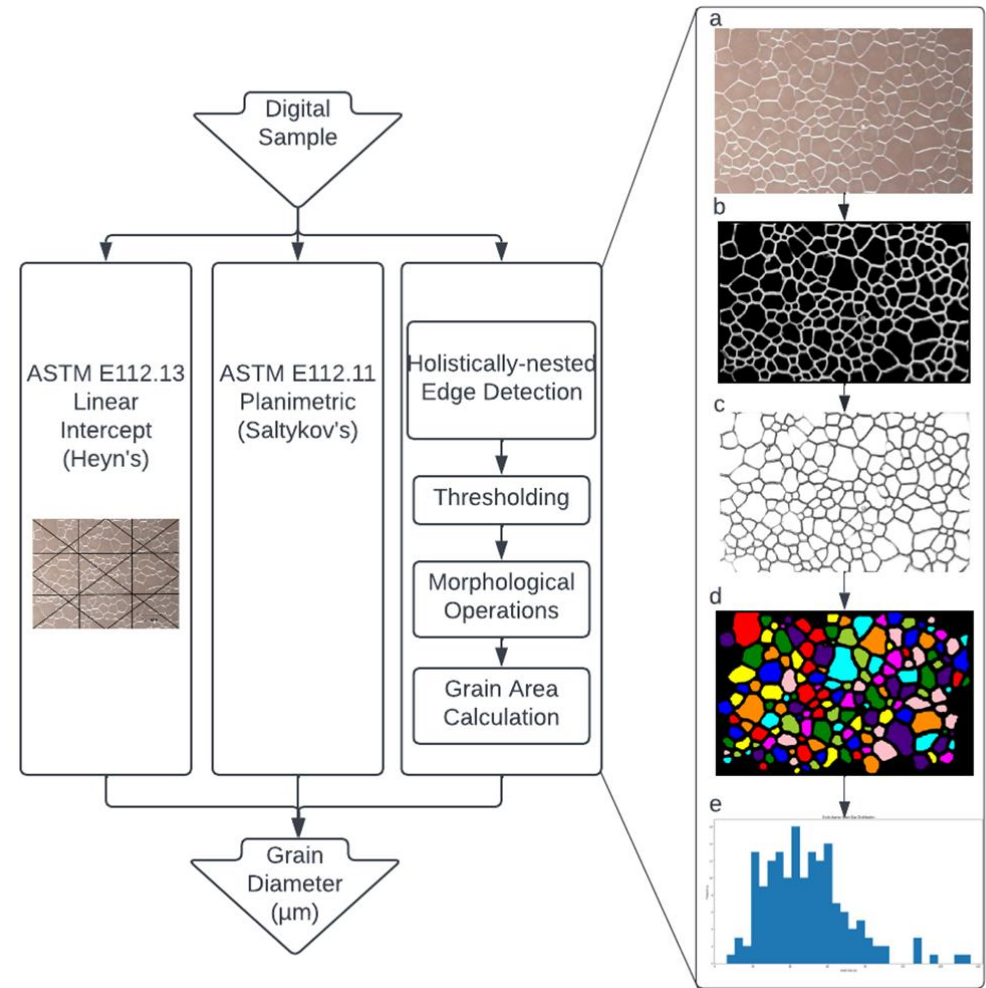
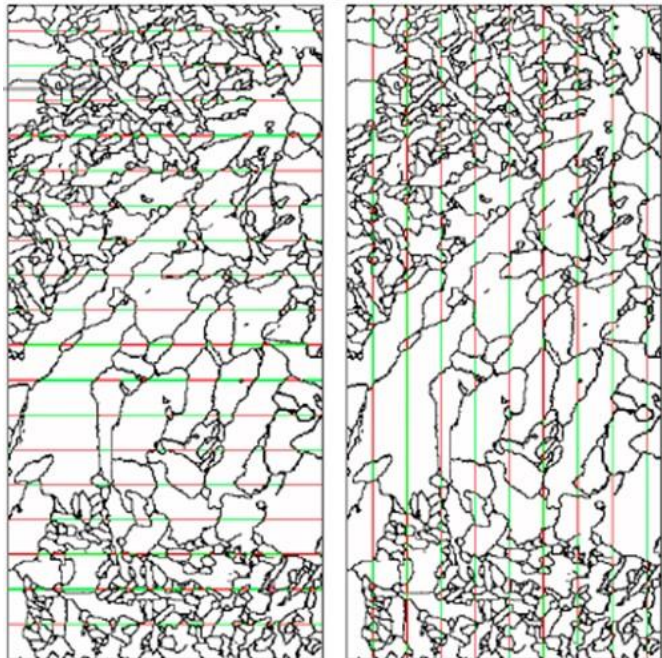


## Challenges from Traditional Methods

- Time
- Expertise
- Error

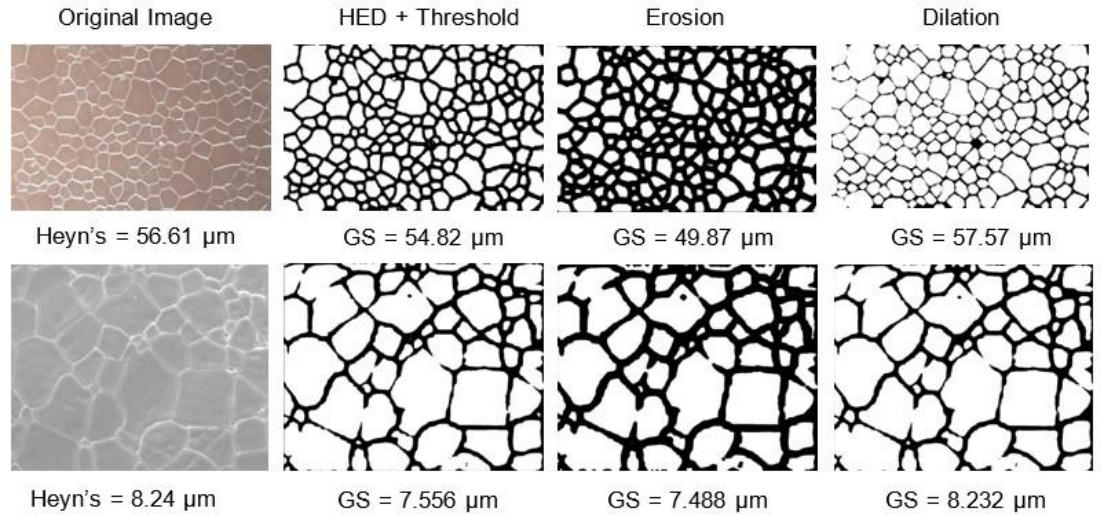
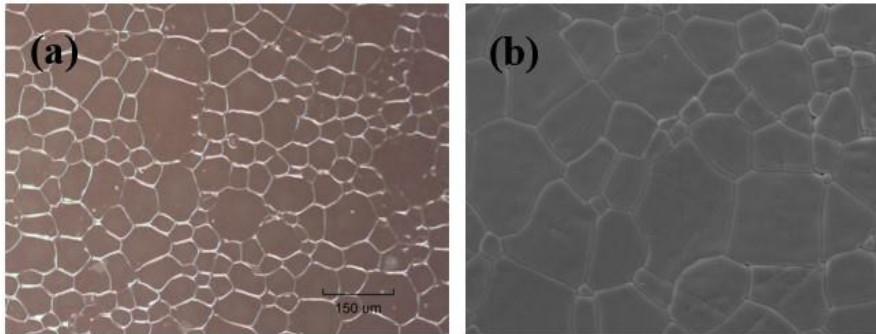


# Traditional vs. CNN-based workflow

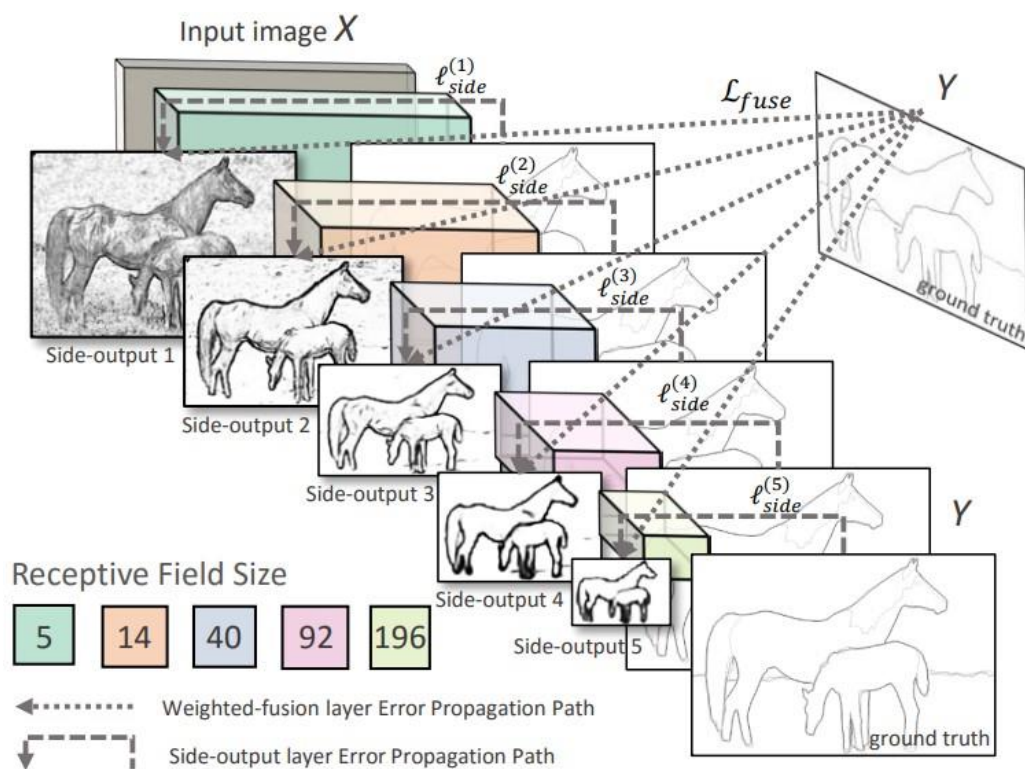


## Morphological operations

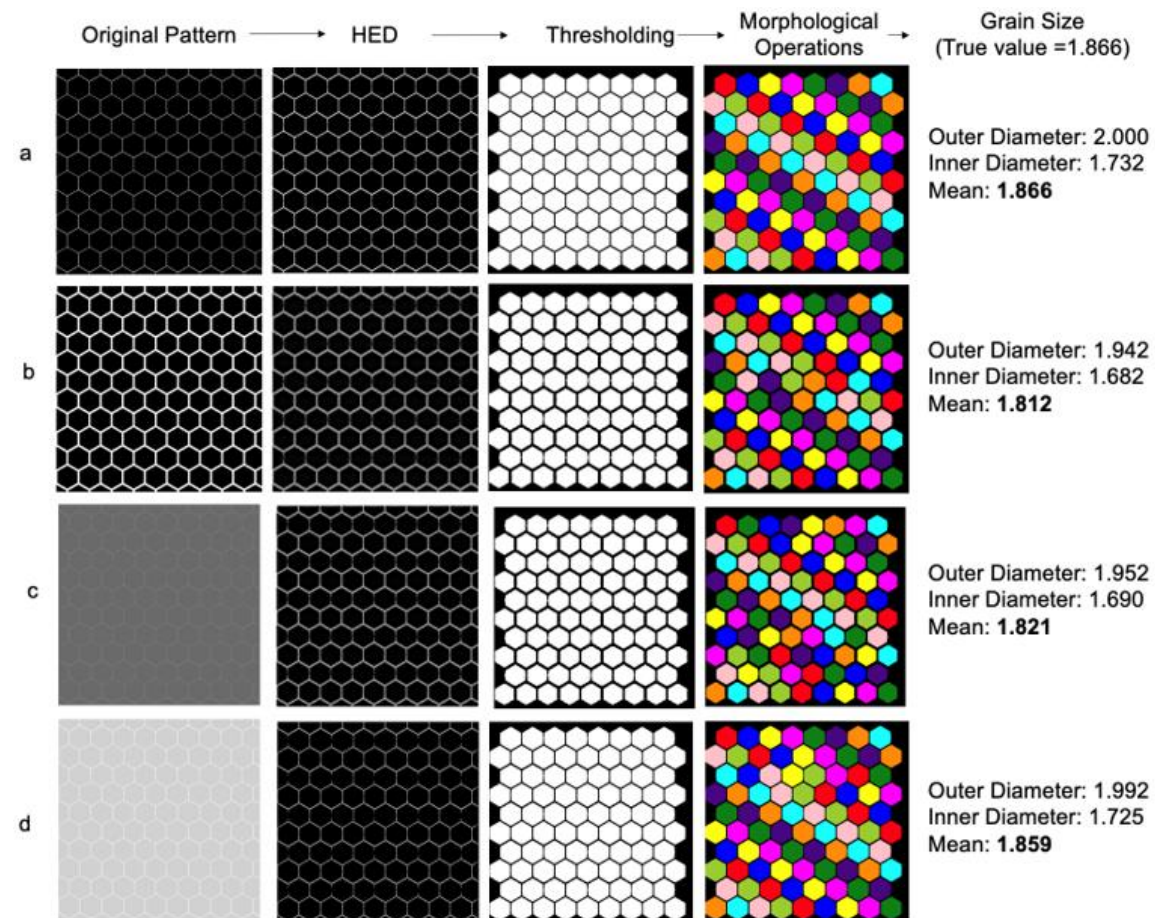
### Dataset



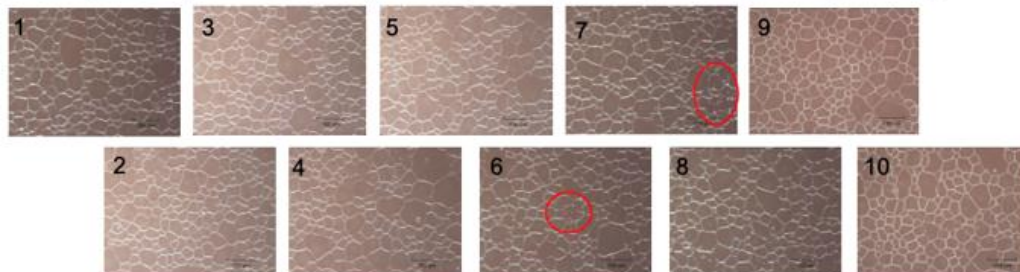
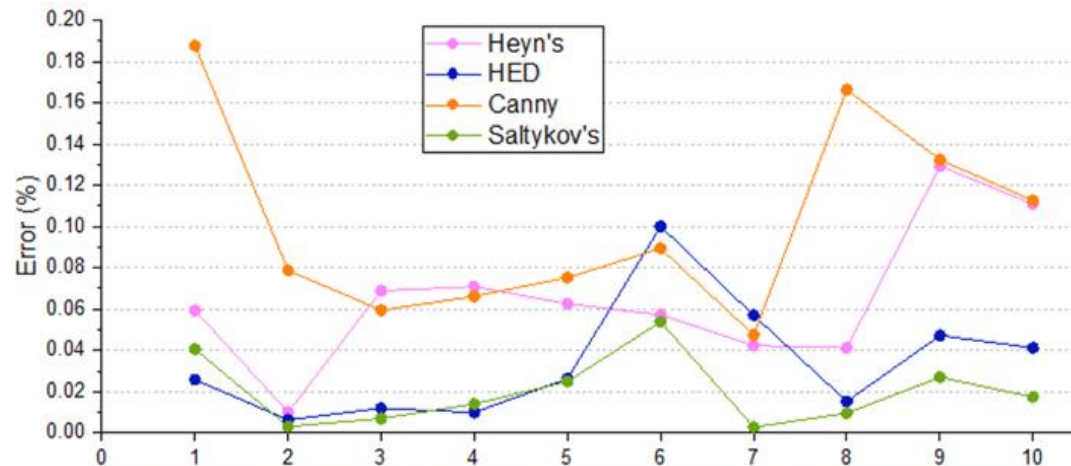
### HED Model



### Honeycomb Test



## Results



## Conclusion

- Reduced time from 15 minutes to under 10 seconds.
- Can be applied to a wide range of pictures.
- Maintain an accuracy comparable to the golden standard.