

Convolutional Neural Network for Additive Manufacturing Defect Detection

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Objectives

- Use convolutional neural networks to classify additive manufacturing images as either defective or non defective
- Construct a convolutional network architecture that will generalize well to other additive manufacturing image datasets

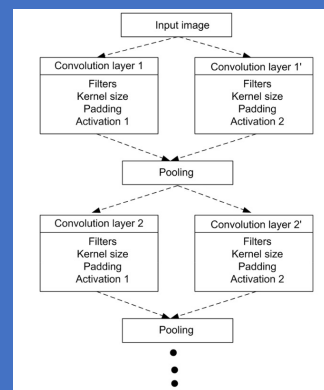
Results:

- Random CNN structure was good for generalization but slow training and prediction times
- Dropout layers generalized well and was faster than random CNN structure
- Basic CNN tended to over fit to training data

Models



Random CNN Structure



Methods

- Used 3 different convolutional neural network architecture
 - Basic CNN
 - CNN with Dropout Layers
 - Random Structure CNN
- Used the 3 models on 3 datasets
 - First dataset: consistent camera angle and background
 - Second dataset: non consistent camera angle and background
 - Third dataset: dataset compiled from google images