**General Questions**

* What kind of defects are being recognized?
* What are the classes?
* Techniques
* Applications
* Types of additive Manufacturing

Proceedings of SPIE (27 March 2019)

**Smart Additive Manufacturing Empowered by a Closed-Loop Machine Learning Algorithm**

Nariman Razaviarab, Safura Sharifi, Yaser Banadaki

* Abstract
  + Deep CNNs to automatically detect defects in printing layers of 3D metal printers
  + 100% accuracy rate on test set
  + Enhance quality of AM manufacturing, fewer quality hiccups, limiting waste of time and materials
* Deep CNN for Computer Vision
  + DANN architecture and transfer learning technique to retrain Inception-v3 [30] model of Tensorflow platform
  + Batch gradient descent with learning rate 0.001
* Schematics of design software
  + Appears to be non-live printing as full layer is inspected in photos
  + Recognizes defects in the entire layer
* Application
  + Enhances industrial applications in aerospace industry and automotive industry
  + Serves as proof of concept for other AM machines like 3D bio-printers or polymer and liquid-based printers

Advanced Intelligent Systems (Communication) (2019-2020)

**Automated Real-Time Detection and Prediction of Interlayer Imperfections in Additive Manufacturing Processes using Artificial Intelligence**

Zeqing Jin, Zhizhou Zhang, and Grace X Gu

* Abstract
  + Machine-learning model is capable of detecting different levels of delamination (a separation along a plane parallel to a surface) conditions, extent and tendency of warping before it occurs in print job
* Approach
  + Utilizes camera-based images with deep learning algorithms to classify/detect delamination ad novel setup established to gauge strain and warp tendencies
  + Uses GCode and live analysis with CNNs (~97.5 accuracy)
* Yuhan’s Additional Notes
  + This algorithm matches nozzle images to corresponding results of printed layer in order to predict nozzle images that may later cause the result to be delaminated

Artificial Intelligence Review (16 July 2020)

**A Review on Machine Learning in 3D Printing: Applications, Potential, and Challenges**

G.D. Goh, S.L. Sing, W.Y.Yeong

* Abstract
  + Introduces various ML techniques followed by discussion on their use in various aspects of additive manufacturing including design for 3D printing, material tuning, process optimization, in-situ monitoring, cloud service, and cyber security.
* Machine learning techniques
  + Supervised
  + Unsupervised
  + Semi-supervised
  + Reinforced
* Applications
  + Design
  + Part quality/process optimization
  + In-Situ monitoring
* Potential
* Challenges
  + Computational cost
  + Standard for qualification
  + Data Acquisition

Elsevier Manufacturing Letters (29 June 2019)

**Autonomous In-Situ Correction of Fused Deposition Modeling Printers using Computer Vision and Deep Learning**

Zeqing Jin, Zhizhou Zhang,Grace X. Gu (second paper)