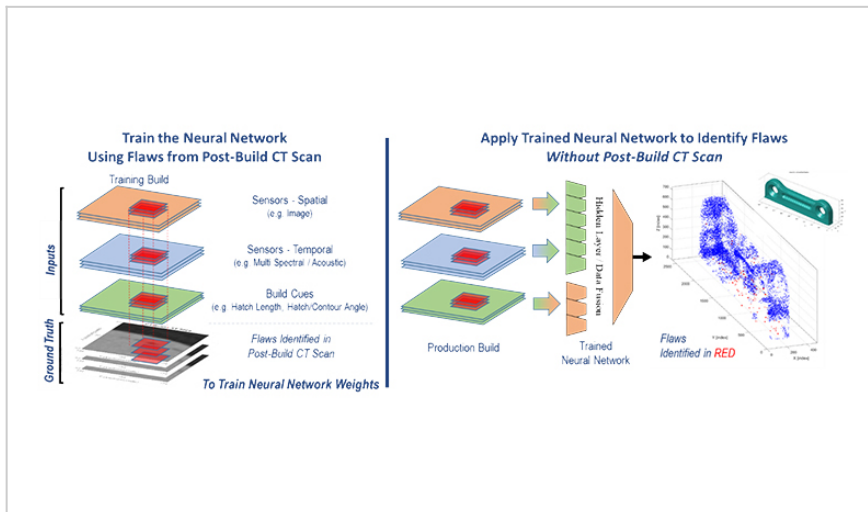


In-Situ Monitoring for PBFAM Using Multi-Modal Sensor Data Fusion

ID# 2019-0951



Training of flaw detection NN

Technology Summary

This technology offers in-situ process monitoring capabilities for Powder Bed Fusion Additive Manufacturing (PBFAM) processes. Real-time, multi-modal sensor data, such as camera imagery as well as acoustic and multi-spectral emissions, are acquired in the build chamber and subsequently fused to generate a coherent footprint of the underlying process. Sensor fusion entails several preprocessing and registration strategies to align all sensor data in the time and spatial domains. Machine learning techniques have been used to correlate anomalies in the data stream to actual physical defects, identified via post-build Computed Tomography (CT) scans.

Application & Market Utility

This technology addresses the need for defect detection in additive manufacturing. Long build times means that defects discovered after the assembly of a part is completed has significant impact. The ability to detect defects in-situ provides an opportunity to correct defects during the build process, allowing for significantly greater acceptance of completed objects due to being defect free.

Next Steps

The research team seeks collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Investment | Licensing | Research

Keywords

- Powder bed fusion additive manufacturing
- Multi-modal sensor data fusion
- In-situ process monitoring
- AM defect detection
- Machine learning

Researchers

Edward W. Reutzel

Associate Research Professor

[Online Bio](#)

Jan Petrich

R&D Engineer

Abdalla Nassar

Associate Research Professor

[Website](#)

Other Researchers

Originating College

College of Engineering, Applied Research Lab

Office of Technology Management Contact

Joseph Rokita

jjr152@psu.edu

814-863-6336