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Fast error detection method for additive manufacturing process monitoring using structured light three dimensional imaging

Fast structured-light imaging detecting additive manufacturing errors in real time with high accuracy.

Researchers at Purdue University have developed a new method for detecting errors during additive manufacturing (AM) that increases efficiency without sacrificing accuracy. The technology leverages cutting-edge structured light 3D imaging, ensuring high measurement precision and reduced computational complexity. Moreover, the method can greatly increase error detection speed during each successive layer of the AM process, making it easier to analyze full-resolution data from a 3D imaging sensor for a real-time closed-loop AM. With this technology, industries that utilize AM will be able to accurately control the quality of their builds with ease, precision, and speed.

Technology Validation:

Compared to an existing AM error detection method based on 3D reconstruction and point cloud processing, experimental results from a material extrusion (MEX) AM process demonstrate that this novel method significantly increases the error detection speed.

Advantages:

-Faster error detection compared to similar existing methods

-Minimized 3D reconstruction reduces computational complexity

-Increased efficiency of additive manufacturing monitoring and error detection

-Cutting edge structured light 3D imaging ensures accuracy

Applications:

Technology ID
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Category
Buildings, Infrastructure, & Construction/Construction Robotics & 3D Printing Robotics & Automation/Simulation, Digital Twins, & Industrial Automation Materials Science & Nanotechnology/Advanced Functional Materials

Authors
Jack Girard
Song Zhang

Further information
Matt Halladay
MRHalladay@prf.org

View online

-Additive manufacturing

Publications:

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