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(57) Abstract :
The quality of laser powder bed fusion components used in safety-critical applications varies widely. Their widespread acceptance is hampered by this. It is also difficult and expensive for those who want to minimise errors to change the L-PBF process settings because of the complex nature of the L-PBF process. The future application of real-time monitoring has been made possible by automatic problem-solving technologies, such as those based on machine learning (ML). The most recent ML applications for L-PBF process monitoring and control are discussed in this article, as well as how they work. In addition to sensors, each of the L-PBF process signatures includes additional information about how they work. These topics are introduced with a brief explanation of the procedure. There are several machine learning approaches and algorithms that are frequently employed in L-PBFs. Machine learning methods for detecting L-PBF process issues are examined in the following section. L-PBF operation errors may soon be detected and repaired with the help of machine learning technologies. This demonstrates how these technologies can be put to use in the real world.

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