Institute of Thermomechanics Seminar
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Lecture
No. 121

Institute of Thermomechanics, Czech Academy of Sciences

invites you to two lectures within the lecture series **Institute of Thermomechanics Seminar**

How to unlock quality consistency and repeatability to enable large-scale industrialization in Additive Manufacturing

given by **Dr. Edson Costa Santos**

Senior Application Development Manager ZEISS AM Technology
ZEISS Industrial Quality Solutions, Carl Zeiss Industrielle Messtechnik GmbH
Oberkochen, Germany

Manufacturers rely on additive manufacturing when they want to boost production efficiency, customize parts, and achieve faster time to market - but how do you transform from rapid prototyping into end-use applications in the medical, aerospace and automotive industries? These benefits can only be achieved by ensuring consistent quality – from material and parameter development, ensuring printer equivalency, process qualification and stability. Digitized workflows based on artificial intelligence, enabling to improve quality, understand causes of failure, drive sustainable process improvements, and set standards for future series production in a holistic approach are the topics of this presentation.

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AI applications in industry and research

given by **Martin Kovanda**

PhD student, Faculty of Nuclear Engineering and Physical Engineering, CTU in Prague
Institute of Thermomechanics of the CAS, Prague

In recent years, the potential of artificial intelligence has increased dramatically, as the hardware capabilities allowed training of ever deeper neural networks. From improving camera image quality to recommending songs, machine learning has become a part of our daily lives. The same revolution is now taking place in industry and research. For example, new deep learning methods allow to automate advanced material inspection, while other models may be used to detect anomalies in ultrasonic signal. This presentation covers the potential applications of AI in industry and research and should give an insight into the new opportunities that these new technologies represent.

The lectures will be held on Friday, November 24, 2023 at 13:00
in the building of the Institute of Thermomechanics (large lecture room),
Dolejškova 5, 182 00 Prague 8

Contact persons: Radek Kolman, Hanuš Seiner, Dušan Gabriel

Short biography

Edson Costa Santos is a Senior Application Development Manager in Carl Zeiss Industrielle Messtechnik GmbH in the Industrial Quality solutions in ZEISS. Since October 2018 he has been working full-time in the ZEISS AM quality assurance / quality control strategic project. Previously, he was the director of the Laser Material Processing Centre in Brazil, the first in Latin America, working with applied research with companies like EMBRAER and PETROBRAS. Dr. Santos finished his master and doctor degrees in laser powder bed fusion of titanium in Osaka University in Japan, has published more than 110 articles and has more than 2000 citations.
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Martin Kovanda is a PhD student at the Czech Technical University in the field of Mathematical Engineering. He is currently working at the Institute of Thermomechanics on tasks related to the application of machine learning to ultrasonic signals. He also works as a freelance IT developer, implementing advanced algorithms and data processing pipelines in Python for various machine learning tasks. His diploma project involved generating an event list from a pure signal and separating the signal into its source components. His current research involves parameter estimation in numerical models of cyclic plastic loading.
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