

PRESS RELEASE

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-----**November 24 and 25, 2021**

Online Workshop: AI, digitalization and materials modeling for better lifetime predictions

In materials and component research, artificial intelligence methodologies will lead to massive upheavals in the coming years. The processes of material development, material processing, lifetime prediction and material characterization will change significantly. By combining AI methods and new forms of knowledge representation, the data-based management of product life cycles will take on new qualities. To address this emerging field of research Fraunhofer IWM set up the online workshop »AI Methods for Fatigue Behavior Assessment and Component Life Prediction« on November 24 and 25, 2021.

Manufacturers and operators of facilities and plants are faced with the challenge of ensuring and reconciling performance and economic efficiency as well as the reliability and safety of their systems. This requires suitable monitoring and maintenance concepts plus valid decision-making fundamentals for adapting operating points to changing operating conditions. Prerequisites for this are material models for service life assessment, methods for the qualification of critical components and a sound database.

The combination of AI methods and knowledge graphs introduces new possibilities for the data-based management of product life cycles. With a view to assessing the fatigue behavior of materials and predicting the service life of components, this results in a new quality of predictions and new starting points for reducing failure costs and increasing plant and systems availability.

In the workshop, renowned experts from science and industry will present corresponding concepts as well as how methods of artificial intelligence and digitalization of materials can be integrated into product development and systems and facilities operation.

Reasons for participation

- International experts from industry and leading research institutions will provide a new perspective on the topic of AI-supported material and component evaluation.

Editorial notes

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FRAUNHOFER INSTITUTE FOR MECHANICS OF MATERIALS IWM

- Discover how lifetime expectancy predictions, material/component development and product lifecycle management are taking on a new quality through the combination of artificial intelligence, data structures and materials modeling.
- Learn how material and component simulation will manifest itself in the future as well as how this will lead to improved decision-making in product development and plant and systems operations.
- Find out about the current state of investigation in an innovative research field and connect with international experts from different disciplines.
- Talks from Schaeffler Technologies, Karlsruhe Institute of Technology KIT, Georgia Institute of Technology, German Research Center for AI, DFKI, Citrine Informatics, Federal Institute for Materials Research and Testing BAM, MINES Paris Tech (École des Mines de Paris), Fraunhofer IWM

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The event language is English. Participation is free of charge. Registration is required, please register by November 12. [Link to Website](#)



Artificial intelligence, digitalization, and materials modeling for better lifetime predictions. The image © Fraunhofer Institute for Mechanics of Materials IWM, Gebhard Uhl, Freiburg

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Fraunhofer IWM – Making intelligent use of materials

- We make the mechanisms and processes in materials and material systems manageable by first assessing and describing them as models. This provides the potential to extract greater performance and efficiency from technical systems.

FRAUNHOFER INSTITUTE FOR MECHANICS OF MATERIALS IWM

- We measure materials down to their atomic structures and influence the interactions. This enables us to modify material properties to meet requirements and achieve new functionalities.
- We scrutinize material systems and manufacturing processes and this knowledge is transferred into reliable products and technologies. Together with our partners from the fields of science and business, we develop innovations with a competitive edge.

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The **Fraunhofer-Gesellschaft**, headquartered in Germany, is the world's leading applied research organization. Fraunhofer plays a central role in the innovation process. As a pioneer and catalyst for groundbreaking developments and scientific excellence, Fraunhofer helps shape society now and in the future. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 75 institutes and research institutions throughout Germany. The majority of the organization's 29,000 employees are qualified scientists and engineers, who work with an annual research budget of 2.8 billion euros. Of this sum, 2.4 billion euros is generated through contract research.

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