PRESS RELEASE

Great Success for RPTU Kaiserslautern-Landau and Fraunhofer ITWM

Doctorate With Application: New DFG Research Training Group Combines Mathematics and Engineering Sciences

The German Research Foundation (DFG) supports the doctorates of young scientists with Research Training Groups. The University Kaiserslautern-Landau (RPTU) and the Fraunhofer Institute for Industrial Mathematics ITWM have succeeded in bringing such a Research Training Group to Kaiserslautern! The interdisciplinary program called MIMO – Mathematics of Interdisciplinary Multiobjective Optimization – offers doctoral students the opportunity to combine mathematics and engineering sciences.

Mathematical multi-objective optimization is a tried-and-tested tool for finding the best trade-offs between different objectives. »Our methods can be applied in many ways. For example, we not only deal with the systematic planning of transport processes, but also with the optimization of radiotherapy for cancer treatment. The aim here is to calculate individualized treatment plans that destroy the tumor but spare surrounding healthy tissue and organs as much as possible,« says Professor Dr. Anita Schöbel, head of the Fraunhofer ITWM and deputy spokesperson of the new Research Training Group.

MIMO Brings Twenty New Doctoral Positions

The aim of the Research Training Group is to qualify the next generation of scientists at a high level. Professor Dr. Stefan Ruzika, spokesperson for the Research Training Group and part of the working group »Optimization« at RPTU, explains: »We train experts who not only master the tools of mathematical optimization, but also constantly rethink the underlying system depending on the application.« Thanks to the funding, RPTU can create up to 20 doctoral positions together with the Fraunhofer ITWM.

In addition to medical therapy planning, MIMO is dedicated to applications in process engineering, thermodynamics, and the construction of high-performance chips.

Mental and Spatial Connection

A lively exchange with other doctoral students makes it easier to overcome the challenges that a dissertation entails. »That's why we attached great importance to networking among doctoral students when designing the program,«

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says Prof. Michael Bortz, deputy head of the division »Optimization« at Fraunhofer ITWM and one of the applicants. »That's why we offer training camps where mathematicians can get to know the applications of their more theoretically oriented research and engineers can deepen their mathematical knowledge.« The young researchers also benefit from the fact that they are housed together in the Felix Klein Center on the RPTU campus

The German Research Foundation (DFG) is funding the project with around seven million euros over the next five years.

Felix Klein Center for Mathematics in Kaiserslautern © Fraunhofer ITWM

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About the Fraunhofer Institute for Industrial Mathematics ITWM

The Fraunhofer Institute for Industrial Mathematics ITWM in Kaiserslautern is one of the largest research institutes for applied mathematics in the world. We see it as our task to further develop mathematics as a key technology and to provide innovative impulses. Our focus is on the implementation of mathematical methods and technology in application projects and their further development in research projects. The close cooperation with partners from industry guarantees the high practical relevance of our work.

Their integral building blocks are consulting, implementation and support in the application of high-performance computing technology and the provision of customized software solutions. Our various areas of expertise address a wide range of customers: the automotive industry, mechanical engineering, the chemical industry, energy and the financial sector. This also benefits from our excellent networking, for example in the Simulation and Software-based Innovation Center.

About the Fraunhofer-Gesellschaft

The Fraunhofer-Gesellschaft, based in Germany, is the world's leading organization for application-oriented research. With its focus on future-oriented key technologies and the utilization of results in business and industry, it plays a central role in the innovation process. As a guide and driving force for innovative developments and scientific excellence, it helps to shape our society and our future. Founded in 1949, the organization currently operates 76 institutes and research facilities in Germany. More than 30,000 employees, most of whom are trained in the natural sciences or engineering, work on the annual research volume of 2.9 billion euros. Contract research accounts for 2.5 billion euros of this total.

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