Fraunhofer
LBF

FRAUNHOFER INSTITUTE FOR STRUCTURAL DURABILITY
AND SYSTEM RELIABILITY LBF

MECHATRONICS / ADAPTRONICS COMPETENCE CENTER

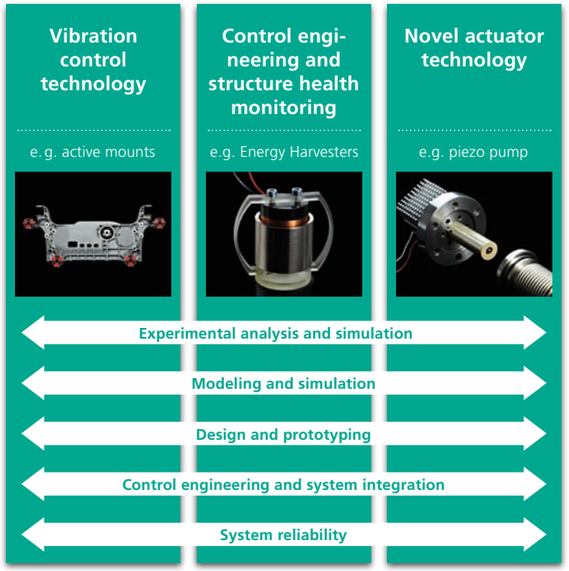
Rapid Control Prototyping systems, dSpace for laboratories and mobile applications, automatic code generation from Matlab/Simulink for prototyping and production systems (e. g. TI C2000 platform, Ethercat)

Manufacturing technology, rapid prototyping machines (SLS system EOSINT P395, 3D printer for photopolymers OBJET EDEN 350), 3D geometry scanners, wire eroding equipment, water jet cutting machine, CNC manufacturing

Test environments for active systems, special test facilities for drive trains, engine bearings, full vehicles (self-propelled); sound measuring room, piezo test equipment, tailor-made test environments

Characterization and test facilities for active materials and E/E systems, test and cycling device for piezo stack actuators (Aixacct), test facility for SMAs, impedance spectroscopy, shakers (combinable with climatic chambers), SEMs and light-optical microscopes

Simulation tools, MBS (Simpack), FEM (Ansys, Nastran), CAE (Matlab, Scilab), FMEA (APIS) as well as Design of Experiments (Statgraphics), electronic simulation EDA (Protel, Eagle), tailor-made tools



RnD-project clusters and team competencies

Mechatronics/Adaptronics Competence Center

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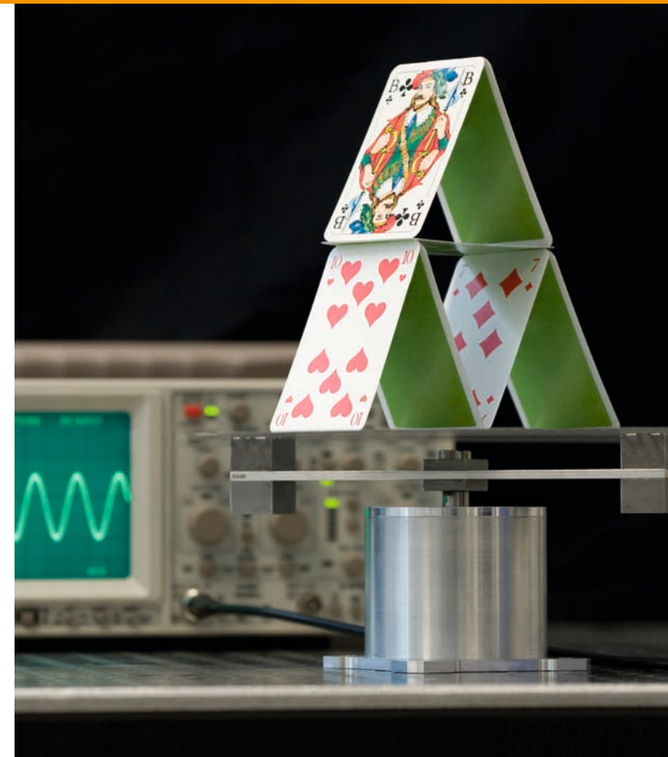

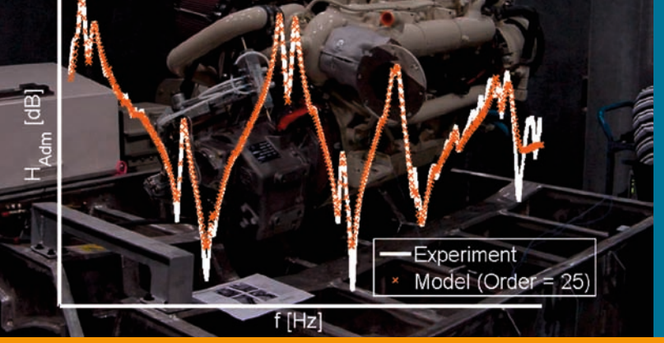

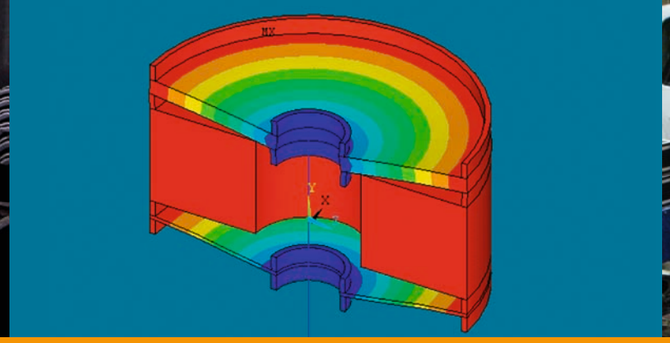

ACTIVE FOR YOUR INNOVATIONS.

SERVICES

Our team supports you in optimizing and even developing your mechanical engineering products, starting from analyzing technical problems to prototyping system solutions. The focus is on mechanical structures, which we improve with regard to dynamic behavior, light-weight design, functionality and performance, by making use of the possibilities provided by both passive and active measures.

The main focuses of our R&D projects are:

Vibration control technology
- Structural dynamic and vibroacoustic analysis
- Consulting service and performance prediction
- Implementation, evaluation and verification of improvement measures in the system

Control engineering and structure monitoring
- Implementation of actively controlled systems
- System integration of distributed controllers and smart sensors
- Development of systems for autonomous data acquisition and monitoring

Novel actuator technology
- Development and implementation of smart actuators, drives and mechanisms
- Integration of sensor and actuator functions into mechanical systems
- Development of test environments with smart actuators

Our Mechatronics/Adaptronics Competence Center assists you with a large range of services - from experimental analysis, if requested worldwide on site, to the prototypical solution, from performance assessment to technical verification in the field, from consultancy to training of your experts.

EXPERTISE

Our technical and scientific core competencies are in the following areas:

Experimental analysis and simulation – our metrological expertise
- Vibration measurement technology, modal analysis, motion and deformation analysis, sound source localization etc.
- Tailor-made test environments
- Long-term data acquisition

Modeling and numerical simulation - our numerical expertise
- Modeling, numerical analysis and examination of coupled problems
- Holistic simulation of passive and active systems
- Transfer of experimental and numerical data into simulation models

Design and prototyping – our electromechanical expertise
- Dimensioning of structural components
- Prototypical manufacturing and integration of electromechanical components
- Commissioning of structural systems

Control engineering and system integration – our signal processing expertise
- Development of electronic components and systems for data acquisition and analysis
- Rapid Control Prototyping and Embedded Control
- Energy self-sufficient, intelligent sensor nodes and sensor networks

System behavior and system reliability – our assessment expertise
- Reliability analysis of multifunctional materials and complex active systems
- Environmental simulation and accelerated tests of electrical/electronic systems
- Functional safety and FMEA

EQUIPMENT (NON-EXHAUSTIVE LISTING)

We always keep our equipment up to date, using the most recent state of the art technologies, e. g.:

Load and vibration data acquisition, mobile data acquisition and analysis platform (LMS Test.Lab), 1D and 3D scanning laser vibrometers (Polytec), stereo high-speed camera system (LiMess), dummy head for mobile sound measurement in vehicles (HEAD Acoustics), flexible 48K microphone array, acoustic camera