bauma ‘Research live’: Information Center for Universities and Institutes

What’s the status quo of research and science? What topics have an influence on the industry? What's in the pipeline? Research live—11th International Information Center for Universities and Institutes will provide insights here. The topics range from Building 4.0 and IoT to innovative building and extraction technologies and efficient component solutions, modern operating environments and autonomous machines and processes.

‘Research live’ will present itself with a new concept and a new location in the foyer of the International Congress Center Munich (booth ICM.310 and ICM.309). The international exhibition of universities and scientific institutes brings us up to speed with the latest research in an interdisciplinary manner. On site: staff and students from 21 departments 14 universities.

What the ten booths and the Info Point Study (Booth ICM.307) on the 300 m² exhibition space will offer? Latest research results on construction machinery, building material plants and mining technology. In addition, five start-ups and spin-offs will highlight the economic potential of research projects—including several bauma Innovation Award finalists and nominees.

The topics?

- ✓ TU Bergakademie and TU Dresden: „Conti-E-Pulse Comminuition
- ✓ TU Munich: “Driver Guidance System 4.0” and “Intuitive Load Control”
- ✓ TU Dresden: “Hüllandruckwinde”
- ✓ IAB Weimar: “Concrete block quality assurance”
- ✓ Vemcon: “Self-learning excavators”
- ✓ Prize winners from 2016 present the development progress—TU Dresden: “Concrete 3-D printing”

Superordinate range of topics:

Let's meet again

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Digitization

- Product lifecycle management via the Internet of Things
- Condition-oriented maintenance of belt conveyor systems
- Customer benefits through IoT and digitization

Construction 4.0 and Building Information Modeling (BIM)

- Industry 4.0 for concrete mixers
- BIM-supported planning, simulation and monitoring of construction sites
- Driver guidance system 4.0
- “Tracking and tracing” of building materials and equipment

Human-machine interfaces

- Intuitive load control for cranes
- Driver guidance system with Augmented Reality (AR) and Building Information Modeling (BIM)
- HMI cluster for construction machinery

Digital development methods

- Real-time simulation of physical systems and digital twins
- Applications of multibody simulation (MBS), finite element method (FEM) and discrete element method (DEM)

Autonomous working

- Driverless transport systems (DTS) for material transport
- Autonomous machines for road construction
- Self-learning excavators
- Cable robots
- Quality monitoring and management in concrete block production
- Quality monitoring and management in road construction

Novel construction technologies

- 3-D concrete printing
- Material damage, destruction or removal by high-voltage pulses

New and rediscovered building materials

- Technical textiles using the example of dike protection
- Printable concretes
- Low-emission and noise-reducing high-tech asphalt
- Technical systems made of wood

Calculation and testing of machines and components

- Service life of wire ropes
- Design of mobile cranes
- Determination of the friction coefficient for mining applications (friction coefficient test bench)
- Mobile hydraulics and system integration

Component and system solutions

- Innovative winches and other intralogistic elements
- Electrohydraulic installation system for collectors under agricultural areas (agrothermia)

Events and hands-on activities:

- Adventure labyrinth with CAN bus-controlled hydraulic seat
- Driverless transport vehicle
- Quality assurance system for concrete blocks
- Interactive construction machine simulators with motion platform
- Driver support through augmented reality and Construction 4.0
- Rock crushing by means of high-voltage pulses
- Laboratory mixer to examine building material properties
- Demonstrator for concrete core temperature control for climate control in buildings
- Building materials to touch:

  compressed concrete, textiles for dike protection, wood for technical constructions
- Functional models of new cable winches
- Model of electrohydraulic development technology for agrothermia
- Load-bearing roller station for monitoring the temperature of belt conveyor bearings

Participating university departments and institutes:

- BME Budapest, Department of Material Handling and Logistics Systems (HU)
- IAB—Weimar Institute of Applied Construction Research (DE)
- OVGU Magdeburg, Department of Material Handling Systems (DE)
- RU Bochum, Working Group for Construction Machinery and Materials Handling (DE)

- TH Köln, Institute for Construction and Agricultural Machinery Technology (DE)
- TH Köln, Cologne Laboratory for Construction Machinery (DE)
- TU Bergakademie Freiberg, Institute for Mineral Processing Machines (DE)
- TU Bergakademie Freiberg, Institute for Drilling Engineering and Fluid Mining (DE)
- TU Bergakademie Freiberg, Institute for Machine Elements, Engineering Design and Manufacturing (DE)
- TU Berlin, Department of Construction of Machine Systems (DE)
- TU Chemnitz, Chair of Material Handling Systems (DE)
- TU Darmstadt, Institute for Road Engineering (DE)
- TU Dresden, IMD, Chair of Fluid-Mechatronic Systems (Fluidtronics) (DE)
- TU Dresden, IMD, Endowed Chair for Construction Machines (DE)
- TU Dresden, Institute of Construction Management (DE)
- TU Dresden, Institute of Material Handling and Industrial Engineering (DE)
- TU Dresden, Junior Professorship in Industrial Design Engineering (DE)
- TU Lappeenranta (LUT), School of Energy Systems (FI)
- TU Munich, Chair of Materials Handling, Material Flow, Logistics (DE)
- TU Stuttgart, Institute for Construction Materials (DE)
- TU Wroclaw, Department of Machines and Industrial Vehicles Engineering (PL)

Participating start-ups/spin-offs:

- IBAF GmbH, Bochum (DE)
- Blik GmbH, Munich (DE)
- Holo-Light GmbH, Ismaning (DE)
- Mevea Ltd., Lappeenranta (FI)
- Vemcon GmbH, Haar (DE)