

IAO NEWS

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Fraunhofer IAO

The basis for all work undertaken at the Fraunhofer IAO is a deep conviction that business success in a globalized arena is contingent on an ability to profitably leverage new high-tech potentials. In order to optimally exploit these opportunities, companies must be capable of developing and implementing customer and employee-oriented technologies faster than their competitors. Work organization concepts must be simultaneously innovative and anthropocentric. A systematic design, in other words, is the outcome of pooled management and technical expertise. This holistic perspective when it comes to project processing ensures that equal consideration is given to commercial success, employees' interests and social consequences.

Through its close cooperation with the Institute for Human Factors and Technology Management (IAT) of the University of Stuttgart, Fraunhofer IAO unites basic university research with applied science and business practice.

More than 14 200 m² of offices, laboratories and technical installations are available to carry out contracted research.

Our customer-focused range of services is based on the following areas of business:

- Corporate Development and Work Design
- Service and Human Resources Management
- Engineering Systems
- Information and Communication Technology
- Technology and Innovation Management

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CANADIAN COLLABORATION KICKS OFF

Fraunhofer IAO and McMaster University in Hamilton, Ontario are pooling their expertise in the field of technology and innovation management. In future, the partners will collaborate on both research and teaching in order to boost the transfer of research findings and innovative solutions into business practice.

HOTEL OF THE FUTURE – A CHANCE TO LEARN

Together with its partners in the FutureHotel joint research project, Fraunhofer IAO is busy building a hotel of the future. The new Hotel Schani in Vienna is scheduled to open its doors in fall 2014 and will serve as a practical field lab, testing the suitability of the latest offers and services in a working hotel environment. Hotel guests elsewhere will soon get the chance to participate in a survey and their responses will help shape the new venture.

GUIDELINE STUDY INTO THE FUTURE OF MANUFACTURING

Fraunhofer IAO is laying the foundations for building the 4th industrial revolution. In its study entitled "Manufacturing Activities of the Future – Industry 4.0", some 600 production managers and over 20 top-class experts sketch out a vision of work in tomorrow's factories. You can download the study for free from June 2013. An Industry 4.0 innovation network is scheduled to be launched on July 2.

INTERFACES FOR TOMORROW'S MANUFACTURING

Fraunhofer IAO has looked into the effects that developments in the field of manufacturing will have on the interface between humans and technology. The study highlights the potential for future-proof human-machine interfaces (HMIs) and discusses the challenges that will have to be overcome in designing tomorrow's HMIs and HMI engineering tools.

ELECTRIC CARS IN ACTION

Imagine a number of different companies sharing a single fleet of electric vehicles... Fraunhofer IAO and eight project partners are busy working out just how to make this vision a reality. Funded by the German Federal Ministry of Economics and Technology, the Shared E-Fleet research project aims not only to work up suitable IT solutions, but also to design the smart energy management and profitable business models that are called for.



From left: Reza Moridi, Ontario Minister for Research and Innovation, Mo Elbestawi, McMaster University, Vice-President Research, and Michael Bucher, Fraunhofer IAO.



Photo: Bernd Müller, © Fraunhofer IAO

CANADIAN COLLABORATION KICKS OFF

Fraunhofer IAO starts working together with McMaster University in Hamilton on research transfer

Collaborations with commercial enterprises and research institutions around the world are very much a part of how Fraunhofer IAO operates. The recent signing of an agreement with Canada's McMaster University in Hamilton, Ontario allows Fraunhofer IAO to expand its cooperative approach on the international stage. Besides joint research and teaching of technology and innovation management topics, the aim of this collaboration is above all to transfer research findings into actual practice and translate them into a form that can be applied in industry.

One of the first target areas for the partners' work will be the automotive sector. Like Germany's Baden-Württemberg, the city of Hamilton – and the whole state of Ontario – is home to a major cluster of automakers and automotive suppliers. Whether in Germany or Canada, these companies face similar challenges, such as how to employ new materials and technologies, or how to deal with increasing cost pressures and growing international competition. "If they take an interdisciplinary approach to finding solutions, and if they apply consistent technology and innovation management, these companies can get an edge on the competition – and even expand into completely new areas of business," says Fraunhofer IAO's Stefan Waitzinger. Meanwhile, scientists at Fraunhofer IAO stand to benefit from the expertise they have built up over numerous projects with companies in and around Stuttgart.

The agreement of understanding was signed by Dr. Mo Elbestawi, Vice-President (Research & International Affairs) at McMaster University, and Michael Bucher, Head of the Technology Strategies Competence Team at Fraunhofer IAO, on May 23, 2013 during the Atlantik-Brücke German-Canadian Conference in Munich.

Detailed planning of the collaboration will begin on Friday, June 7, when the partners will meet in Burlington, Ontario, a city neighboring Hamilton, to discuss exactly how they will work together. The aim is also to set up a joint research center in the immediate vicinity of McMaster University.

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HOTEL OF THE FUTURE – A CHANCE TO LEARN

Fraunhofer IAO and partners are putting a FutureHotel lab in the field

Led by Fraunhofer IAO, the FutureHotel joint research project has been tackling the key questions surrounding the hotel of the future since 2008. The project's current research phase is focusing on developing new, groundbreaking solutions for making reservations, checking in and out, the lobby and the rooms themselves. These solutions will then be put through their paces and adapted flexibly as part of the day-to-day running of the Hotel Schani.

In developing solutions that are both market-ready and visionary and that suit all hotel guests – regardless of whether their stay is based around business or pleasure – Fraunhofer IAO has enlisted the help of hotel experts from HRS. "We are thrilled to have support from our partner HRS in carrying out this exciting project in which theory meets practice," says Vanessa Borkmann, director of the FutureHotel project at Fraunhofer IAO.

"Advances in technology, and an associated increase in people's mobility, will change the very nature of the travel industry. Today's travelers expect services that offer them simplicity and flexibility when planning a trip and deciding what to do once they reach their destination. This makes our collaboration with Fraunhofer IAO a perfect partnership for developing state-of-the-art solutions that are not only commercially viable, but also visionary," adds Björn Krämer, Director of Mobile & New Media at HRS.

The next step for the FutureHotel project partners will be to determine which innovations travelers would like to have available when booking and staying at a hotel. A comprehensive survey of hotel guests is about to get underway and their responses are to be used to help design of Vienna's new hotel.

Benedikt Komarek, manager of the Hotel Schani, says: "In addition to running our hotel, from the end of 2014 we will also be working with HRS and Fraunhofer IAO to road test new groundbreaking solutions. We are delighted at the prospect of this collaboration and to be pioneering this new territory."

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GUIDELINE STUDY INTO THE FUTURE OF MANUFACTURING

Survey of production managers and experts sketches out a vision for Industry 4.0

The Internet, mobile devices and smart objects are changing the face of manufacturing, and experts agree that this fourth industrial revolution – or “Industry 4.0”, as they are calling it – will have a profound effect on the way we make things. Hallmarks of this change will be the blanket use of information and communications technology as well as sensor systems. The real-time capability provided by mobile communication, autonomous objects and real-time sensor systems enables not just decentralized control but also ad hoc tailoring of processes. This in turn will help companies speed up and increase the flexibility of how they respond to customer requirements.

But so far we have only a vague idea of what Industry 4.0 actually means in concrete terms for Germany’s manufacturing sector and its employees. Fraunhofer IAO’s recent study entitled “Manufacturing activities of the future – Industry 4.0” gives science and industry a basis on which to build the fourth industrial revolution. The study sketches out various directions in which manufacturing activities could develop and supports companies as they move toward Industry 4.0. It describes the roles humans and machines will play in manufacturing in future, along with how networked mobile communication and flexible manufacturing activities will create new competitive advantages for innovative manufacturers. Not least, the study throws light on a 4.0 approach to production control and clarifies where manufacturing activities and knowledge work will merge in future. It is a must for anyone in the German manufacturing sector who is keen to shape the future of their industry.

But when it comes to working up solutions for the future of Germany’s manufacturing activities, theory is by no means enough for Fraunhofer IAO. To come up with practical approaches, the institute is launching the Manufacturing Activities 4.0 innovation network. Made up of industrial companies and research partners, this network will hold its kickoff event in Stuttgart on July 2. Fraunhofer IAO’s Industry 4.0 Future Lab also gives manufacturing companies the chance to take a networked Industry 4.0 approach as they examine various economic applications, find practicable ways to implement them, and develop profitable new business models. If you are interested in getting involved, please get in touch with the contact person listed below.

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INTERFACES FOR TOMORROW’S MANUFACTURING

A trend study identifies the potential for humans and technology to interact in a manufacturing environment

Human-machine interfaces (HMIs) are absolutely central to production processes, and as such they have a major influence on the quality and efficiency of industrial manufacturing. HMIs not only make it possible to control and monitor facilities, they also provide valuable information on those facilities’ operational status. Current and future developments in manufacturing – including the changes referred to as Industry 4.0 – will also affect the role played by the interaction between humans and technology. While the growing connectivity and intelligence of systems promise greater flexibility in processes, they also have the effect of increasing complexity. This makes it all the more important to involve the future users of an HMI early on in its development.

Fraunhofer IAO has completed a trend study to identify and explore the key areas for action to ensure humans can interact with technology in tomorrow’s manufacturing. In particular the study considers all aspects of ergonomic HMI design as well as how to integrate new technologies such as interactive and recognition technologies or social media. Since HMIs are often produced using special development tools, the study also looks into the functionalities and opportunities such tools can provide.

One point the study makes is that while development work is simplified by certain tools offering standard functionalities such as SCADA (supervisory control and data acquisition), these tools can restrict the range of design possibilities for the HMI. Using the right HMI tool, however, can in itself bring significant benefits in terms of innovation. With manufacturing environments in flux, what is needed is a set of future-proof HMI developer tools along with a detailed analysis of the design possibilities.

The content of the study is drawn primarily from workshops and interviews with relevant experts from the areas of manufacturing operations, IT, and the interaction between humans and technology. In order to make the results of the study as readily applicable in practice as possible, the experts approached came not only from the scientific community but also from industry. The study highlights the changes that the manufacturing sector is about to undergo as well as the challenges this presents for the design of interfaces between humans and technology.

In addition to offering specific measures and guidelines for how to design powerful HMIs, the study recommends selection criteria for the necessary engineering tools. These can serve as an aid both in designing and developing appealing HMIs and efficient engineering tools and in adopting a suitable future-proof HMI engineering environment.

A PDF version of the study is available online for free at www.iao.fraunhofer.de/images/iao-news/studie_future_hmi.pdf. The print version is priced 59 euros and can be ordered from the IAO shop.

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ELECTRIC CARS IN ACTION

Small and medium-sized companies sharing fleets of electric vehicles

While electric vehicles are becoming a more common sight in Germany, the government's target of having one million of them on the country's roads by the year 2020 still seems a long way off; it will take a definite jump in user acceptance to meet this target. Corporate fleets represent a promising market segment for electric vehicles, and they could act as a strong signal to the public at large that the tide is turning. Right now in Germany, some 100,000 companies are using corporate fleets, with most fleets run by small and medium-sized companies. And it is for this kind of user in particular that fleet sharing is a viable alternative to the expense of buying and maintaining a fleet of their own.

As part of the Shared E-Fleet project, Fraunhofer IAO and its eight project partners are busy developing suitable concepts for how a single fleet of electric vehicles could be shared by many different companies. Key questions include how to make vehicle reservations user-friendly, billing straightforward, and vehicle charging ecologically sound and cost-effective. Shared E-Fleet will use real application scenarios to work up and test solutions in a variety of pilot schemes. Pilot users for these tests will include the STEP Stuttgarter Engineering Park (STEP) and Münchner Technologiezentrum (MTZ) technology parks.

According to a recent survey, potential users view electromobility in a fundamentally positive light. What is more, the conditions for when it makes sense to use electric vehicles are effectively already being met: business journeys are generally no more than 100 kilometers, for example. What future users are skeptical about is the profitability of electric

vehicles in a business context. This highlights how important it is to establish profitable business models – which is one of the topics Fraunhofer IAO is addressing as part of the Shared E-Fleet project. Another topic that will prove critical to the success of electric vehicle fleets is that of smart energy management. In tackling this issue, Fraunhofer IAO is exploring how to reconcile fleet vehicles' charging needs with their operating schedules. Once the conceptual design and implementation phase is completed, the Shared E-Fleet pilot scheme is set to get underway in early 2014.

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Shared E-Fleet consortium

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- Marquardt GmbH
- MGH-Münchner Gewerbehof- und Technologiezentrumsgesellschaft mbH
- Siemens AG
- STEP Stuttgarter Engineering Park GmbH
- TWT GmbH Science & Innovation

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