Media Computing Group

SLAP: Transparent controllers help visitors explore content on multitouch tables.

Interactive Exhibits. Made in Germany. With the Visitor in Mind.

We design and implement cutting-edge, engaging public interactive exhibits.

The Media Computing Group is part of the Computer Science Department at RWTH Aachen University in Germany. We invent and design new user interfaces and new ways for people to interact with media and technology.

15 Years of Experience.

Professor Dr. Jan Borchers founded this group as full professor in 2003, after teaching at Stanford University in the U.S. and at ETH Zurich in Switzerland. As part of his work, he has been designing interactive exhibits and tour guide systems for museums, exhibition centers and public spaces for more than 15 years.

Technology? Yes. But Usability First.

Our work uses new interaction technologies, offering visitors novel ways to interact with objects, media and content that many are experiencing for the first time. At the key of the user experience, however, we place optimal usability—even for the typical visitor who only uses the system once in his life, for a very short amount of time, with no prior training and no external need to engage with the exhibit other than his own curiosity and joy of exploration. In 2001, Prof. Borchers published key design guidelines for interactive exhibits based on his work in his book "A Pattern Approach to Interaction Design".

The Research Advantage.

As a partner, our group guarantees access to the latest results from research and development in interactive technologies. RWTH Aachen University is Germany's #1 university in attracting funding from the German National Science Foundation (DFG), and our group has been Germany's best-published group at the top international conference on user interfaces for many years, documenting the quality of our R&D work. This advantage allows us to provide our clients with technical concepts that are still several years away in the standard exhibit construction industry.

Hardware. Software. Iterate. Integrate.

We are highly skilled in developing engaging interactive software for stationary and mobile systems. Our iPhone Application Programming class, for example, is a top national download from Apple's iTunes U eLearning platform. But we also have the knowledge to create hardware prototypes in-house that use cutting-edge technology before it becomes widely available, with a full lab including 3D printers, lasercutting, PCB fabrication, and microcontroller design expertise.

But we also know what we're not good at, and enjoy working in partnerships with experts for graphic design, A/V equipment, or interior architecture.

Most importantly, however, we iterate our designs, and test with real users, until the user experience is perfect.

University + Company: A Winning Combination.

As founder and CEO of the company actibits GmbH, Prof. Borchers also provides a commercial entity for the realization of interactive installations and exhibits.

Engaging Visitors. Worldwide.

Our work has been installed in the Ars Electronica Center Linz, at World EXPO 2010 in Shanghai, the Boston Children's Museum, the House Of Music Vienna, and other museums and exhibition centers around the world.

Below, we present a small sample of our projects that you might find interesting.

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Contact:
Prof. Jan Borchers
Media Computing Group
RWTH Aachen University
Ahornst. 55
52074 Aachen, Germany
http://hci.rwth-aachen.de
borchers@cs.rwth-aachen.de

SILHOUETTES: 16 visitors pose as trees, houses, etc. to create their own 3D virtual city block neighborhood. German-Chinese House, World EXPO 2010 Shanghai. Several hundred thousand visitors.

Silhouettes

For the German-Chinese House at the World EXPO 2010 in Shanghai, we developed the software for *Silhouettes*, an innovative interactive experience based on the Chinese art of shadow play. The EXPO motto was the City of the Future, so our exhibit turns the silhouette of each visitor into a house, tree, water pipeline or electricity line with real time feedback. This way, a group of visitors creates their own city block through shadow play. The result is turned into a SimCity-like 3D rendering of an actual city block that extends a large virtual online city in 3D. Visitors receive a fridge magnet with a code to find their city block online, along with a digital group photo of their visit.

The exhibit used full-body control—long before Microsoft introduced their Kinect to the public. Silhouettes was so successful that, contrary to the original plans, its running time was extended to the full six months of EXPO 2010.

The architectural design for Silhouettes was carried out by another RWTH professor, architect Peter Russell.

http://hci.rwth-aachen.de/silhouettes

Peace Table

This exhibit was designed for the city hall in Aachen, Germany. It extends the well-known multitouch table by adding tangible, physical objects to it that get tracked by the table. This brings the haptic experience back to the world of featureless glass surfaces. Visitors pick up wooden blocks, each of which represents a key person that contributed to a important historical peace treaty of 17th century Europe. Putting the block onto the table displays information about that person. Flipping the block over reveals different facets of their personality. Blocks are connected via a projected red "thread" that winds through history, showing historical connections and influences. Four visitors can explore the table simultaneously, each in their own individually selectable language by pressing a language button at their end of the table. The Peace Table illustrates several of Prof. Borchers' key design patterns for interactive exhibits, such as EASY HANDOVER, LANGUAGE INDEPENDENCE, INNOVATIVE APPEARANCE, and COOPERATIVE EXPERIENCE.

http://hci.rwth-aachen.de/aachenerfrieden
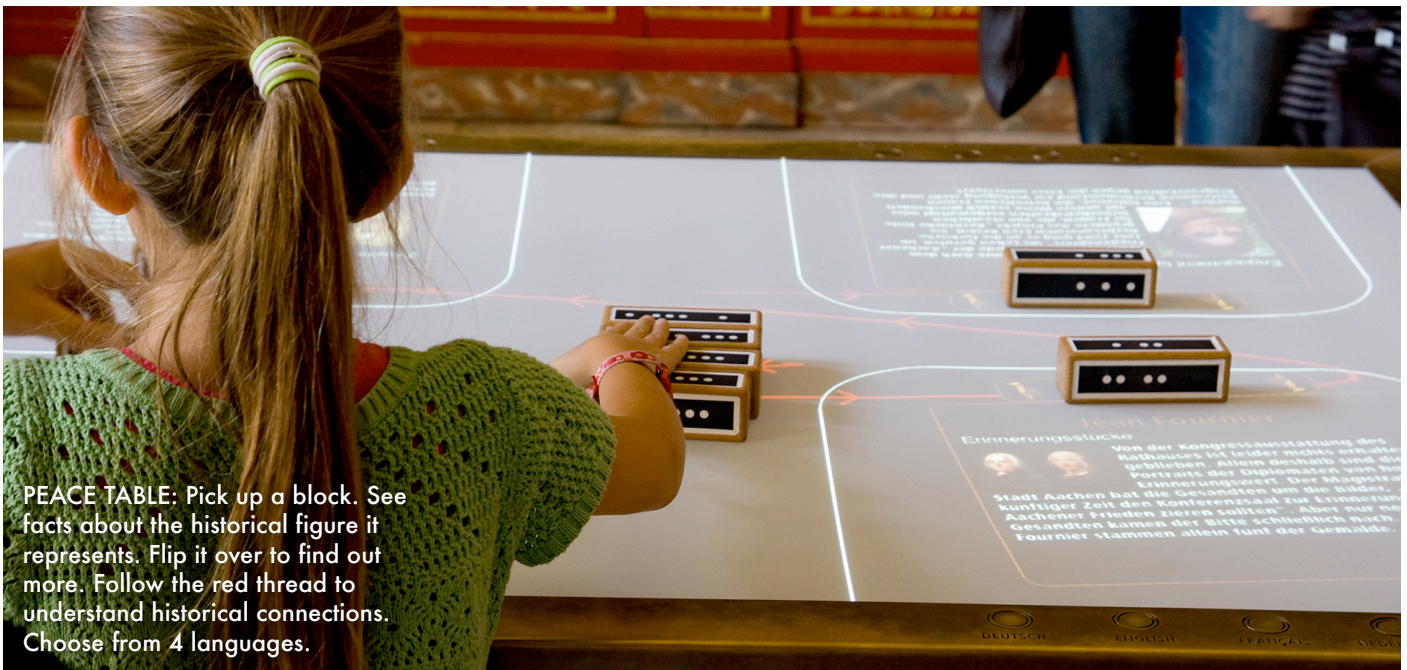
PEACE TABLE: Pick up a block. See facts about the historical figure it represents. Flip it over to find out more. Follow the red thread to understand historical connections. Choose from 4 languages.

Personal Orchestra

In 2000, we created this exhibit for the House of Music in the heart of Vienna. It lets visitors conduct the Vienna Philharmonic on a large video projection. It was the world's first exhibit to allow interactive tempo changes of a real audio/video recording through conducting—without changing the audio pitch.

The exhibit has been such a success that we re-implemented it for the museum in 2009 using Full HD and adding an interactive music stand. It has been used by more than 2 million visitors. We created similar experiences later for the Boston Children's Museum and other museums in the US and Europe.

One of the visitors' favorite effects is that, if you conduct too quickly, slowly, or erratically, the orchestra will actually stop playing, and complain loudly about what a lousy conductor you are. This way, we turned an error message into one of the exhibits most-enjoyed features.

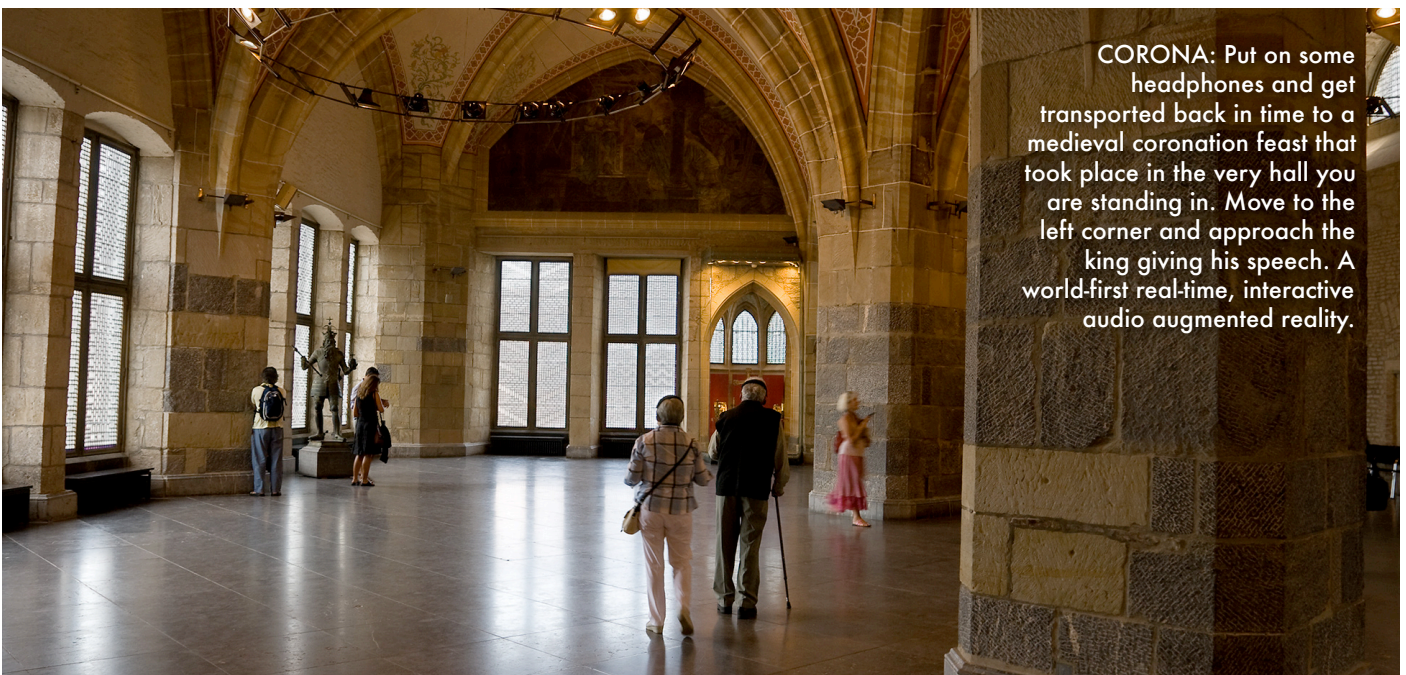http://hci.rwth-aachen.de/po

CORONA

For the medieval city hall in Aachen, we created the world's first audio-augmented reality installation that lets you explore a space with historical figures by actually walking through the space they used 500 years ago. Precision indoor tracking determines each user's individual position and head orientation in the space and uses this information to render a 3D audio scene in real time onto a mobile device. This way, by walking around the empty hall, visitors can hear, say, the king giving a speech in one corner, diplomats discussing court politics in another, or kitchen maids going over the menu to serve in yet another. Volume, reverb and other effects are simulated to create the impression that these people are actually there.

The exhibit uses our own iPhone-based *Aixplorer* mobile audio guides. We used our extensive knowledge in iPhone software development to build this installation. The same Aixplorer device is also used to provide tour guide functionality to the tourist for the rest of the building and the entire city.

http://hci.rwth-aachen.de/corona