

InteractiveWall

FESTO



Real time interactive
architecture

Info

Wall interacts with the user



InteractiveWall transforms the behaviour of people standing in front of it into motion, light and music in real time and thus interacts with the user.

InteractiveWall consists of seven individual wall elements, each 1.09 meters wide, 0.53 meters deep and 5.30 meters high. These elements comprise a structure with Fin Ray Effect®, which was derived from the anatomy of a fish's tail fin. The advantage of this structure is that it can be moved and laterally deflected like a mechanical system of levers, by means of just two electric drive units from Festo. This structure moves about its central axis towards and away from the user, thus forming either a convex "hunchback" or a concave "hollow".

A small change of the electric drive units is sufficient to yield a large displacement for InteractiveWall. The Fin Ray Effect® was implemented to produce a technically realisable architectonic design by the company Burkhardt Leitner constructiv.

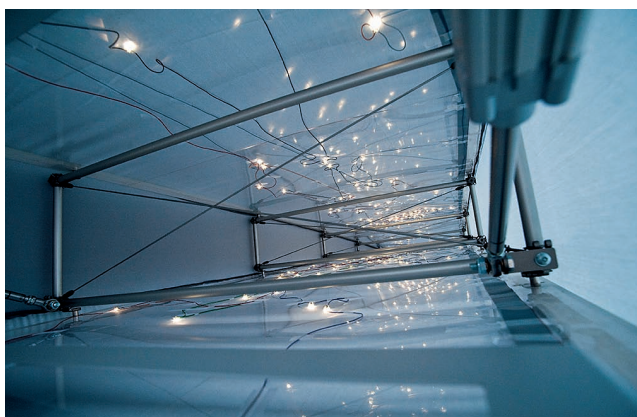
The InteractiveWall "senses" the trade fair visitors with ultrasound sensors; these data serve as input parameters for the wall's behaviour. The wall is also fitted with integrated light-emitting diodes (LEDs). Each segment of InteractiveWall is provided with 24 circuits, each of which includes 20 LEDs, that form a highly reactive interface. The LED skins respond directly to user presence by glowing brighter when users are near, and glowing dimmer as they move away. In addition to dimming, the LED skins pulse rapidly and slowly in relation to the position of the other wall elements. These can also be programmed individually.

The individual InteractiveWall segments can either follow a controlled pattern, e.g. to produce a wave movement, or interact with the visitors. In this interaction mode, the electric drive units from Festo convert the signals from the ultrasound sensors into motion. The structure then moves away from the user, for example, when he or she approaches InteractiveWall.

Collective behaviour of InteractiveWall

The individual InteractiveWall segments bend independently in response to the presence of a user. Although responsively independent, the HyperWall elements synchronize by constantly readjusting its position in order to align itself with the position of its nearest neighboring segments. In this configuration, the individual elements exhibit collective behaviour.

A further possibility is the continuously variable combination of controlled wave movements and interaction with the visitors. The entire hardware and software for this interaction was realised by the Hyperbody group of the Faculty of Architecture at Delft University of Technology. Already in the past, Professor Kas Oosterhuis and his team had gained a great deal of experience in the programming of real-time architectures.



Interior view with EGC, linear axis



InteractiveWall – a new form of architecture

InteractiveWall demonstrates a new form of architecture that is no longer static, but dynamic and interactive – an architecture that reacts to and can perhaps even anticipate the users' wishes. The behaviour of this interactive architecture is influenced and largely determined by the user.

With its electric and pneumatic drive units and the accompanying control and regulation technologies, together with an appropriate sensor system, Festo will in future be able to transform architecture into an anticipatory system.

InteractiveWall's architecture follows a general development in society towards individualization, personalization and customisation. This trend can be observed in both the technology and the use of mobile telephones, household appliances and automobiles.

Especially in trade fair stand design, there is steadily increasing demand for interactive, responsive and customisable architecture that displays collective behaviour. "Communication" with InteractiveWall is a special encounter for visitors to the trade fair that by far transcends the bounds of everyday experience.

With InteractiveWall, Festo is pointing out opportunities offered by the combination of intelligent and adaptive mechanics with interacting and anticipatory architecture and software. For the visitor, a visit to the trade fair thus becomes a holistic experience for all the senses.



Technical data

Length:	1.09 m
Width:	0.53 m
Height:	5.30 m
Electric drive units:	DNCE-32-400, motor with EMMS-40-M-TMB
Control:	CMMP-AS Arduino, open-source electronics prototyping platform
Software:	Arduino, an open-source electronics prototyping platform Max/MSP and Jitter, an interactive graphical dataflow programming environments Ableton Live, a comprehensive environment for writing, producing and performing music
Brands:	Fin Ray Effect® is a brand of EvoLogics GmbH, Berlin, Germany



Project partners

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