ada@expo.02 fact sheet

Ada team Institute of Neuroinformatics
uni | **eth** | zürich

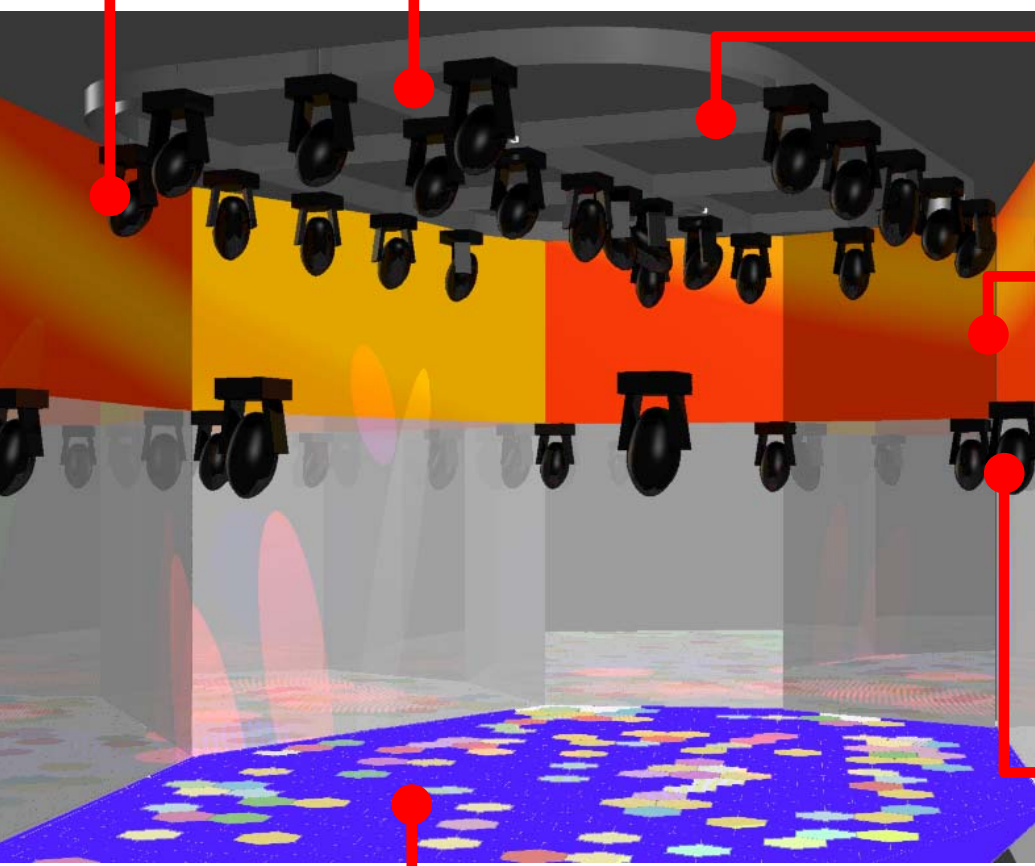
Ada is the product of interdisciplinary research at the Institute of Neuroinformatics into the structure and function of the brain. She is a fully autonomous interactive space, conceived as an artificial organism, capable of supporting simultaneous dynamic interaction with large numbers of people. As an example of a new breed of autonomous artefacts based on brain-like technologies, Ada is intended to stimulate discussion of the implications for our future society of these new technologies.

Light fingers

21 pan-tilt moving lights are used to indicate when Ada is attending to a particular visitor, as well as for general mood setting. The lights are controlled using the industry standard DMX protocol.

Sound recognition & localisation

Two sets of three microphones in the ceiling allow Ada to detect certain types of sounds by analysing their frequency properties. She can also determine where the sounds were generated by using their arrival time, phase difference (similar to how humans localise sound) and triangulation. Achieving both of these tasks in real-time in a very noisy, echo-filled space is an extremely challenging task.



Musical expression

Sound output is provided by 4 background music speakers, 24 local speakers, and a MIDI-controlled matrix mixer and sampler. Local sound effects can be produced in 12 different regions of the space. Ada expresses herself using a real-time synthetic musical composition system called *Roboser,* developed at INI and NICS in Brazil. The musical composition consists of a 12-voice behavioural mode controlled soundscape modulated by Ada's emotional states and sensory events.

Visual synthesizer

A 360° ring of 12 LCD video projectors provide Ada with advanced visual display capabilities. Using the screens as a single virtual display, she can render 3D objects in real-time, and display live video with smooth transitions between screens. A specialised cluster of six computers supports this functionality. The displays on the screen express Ada's behavioural mode, emotional state and sensory events.

Gazers

Nine gazers, each with pan/tilt/zoom capabilities, make up Ada's eyes. She records images of "interesting" visitors and displays them on the visual synthesizer. Ada can calibrate the targeting of her own gazers by looking at her floor tiles and adjusting her gazers appropriately.

Floor tiles

Ada has a skin of 360 active floor tiles (patent pending). Each tile has 3 pressure sensors, 3 neon tubes and an on-board microcontroller. All of the tiles are connected to each other using the Interbus serial bus standard.
Using her skin, Ada can track her visitors, test their responsiveness to cues, and interact with them in many different types of games.

Neuromorphic control software

Ada's brain is a highly distributed hybrid system consisting of simulated neural networks, agent-based software and conventional object-oriented and procedural code. All of the software, including a general-purpose neural simulation package called IQR, was developed at INI.
The software supports her basic sensory, real-time control and behavioural capabilities, including visitor tracking and identification, game playing, and the maintenance of continuous communication with visitors using sound and light.
Ada is the largest neuromorphic system yet constructed.

Computers

Ada runs on a cluster of over 30 custom-built, rack-mounted computers (AMD Athlon 1800+, 0.5-1.0 Gb RAM) running Linux. They consume a total of 5 kW of electrical power, plus an additional 4 kW for cooling.

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Artistic concept

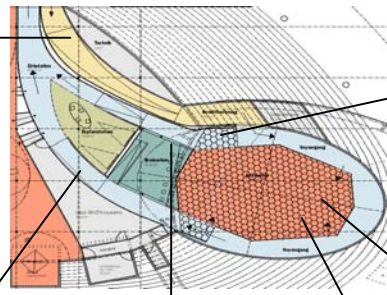
Ada is a creature that lives, behaves, communicates and feels. Ada does not look or function like any creature we know. For the visitor Ada is a multi-modal immersive experience where each individual can have their own unique dialogue. The different modalities of Ada were balanced so that visitors were drawn into a wholistic perspective on artefacts and themselves. Due to the ability of Ada to interact and communicate in a goal-oriented fashion the visitor became a participant, an active explorer. Through this, Ada communicated that each visitor is an active participant in the definition of our future and the artefacts that will become part of it.

Excerpts from the guest-book I

• ADA, das ist der Anfang einer neuen Technologie. Ihr habt dieses Thema auf eine unterhaltsame Art dargestellt. Vielen Dank dem ganzen Team. Walter G
• Very interesting and deep experience. Thanks to open our mind and ask good questions. Christelle
• Ada ist super gut, möchte mehr Infos bei der Auswertung. Liebe Grüsse. Nicole.
• Dear Ada, we have just met, we started to know each other and I have to leave you. Ada believe me, human beings can be very interactive, pleasant, joyful and curious. I am sure I'll meet you again soon. Yours Rachel M.
• Super, dass es so ein tolles Projekt wurde! Hoffe, dass die Zukunft noch vieles weitere für Ada bringt und das Projekt kein Ende finden wird! Patricia M.
• Für mich der beste Pavillon der Arteplages Biel und Neuchâtel. Nur: was passiert mit Ada nach der Expo.02? Anette K.

Exhibition layout

1. Conditioning tunnel 65 m^2



2. Voyeur hall 81 m^2

5. Explanatorium 60 m^2

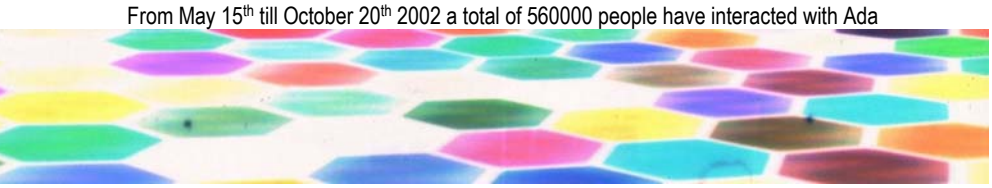
4. Brainarium 30 m^2

3. Ada proper 160 m^2

Excerpts from the guest-book II

• Dear Ada, qu'il fait bon vivre le rêve du futur! Un futur précieux. Merci pour l'Expo et à la fille de Lord Byron ! et à votre équipe.(**dear Ada, it feels good to live the dream of the future! A precious future. Thanks to Expo the daughter of Lord Byron! And to your team)** Anne D.
• Ada, erst der Anfang, ... weiter Weg, der sich für die Menschheit in Zukunft sicher lohnen wird. S.

From May 15th till October 20th 2002 a total of 560000 people have interacted with Ada



Ada Online

You can find more information about Ada at the following sites:
http://www.ada-exhibition.ch
http://www.expo.02.ch

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