



Future VR:
Progress in VR Devices
For Museums
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Electronic Visualization Laboratory



25 years

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Electronic Visualization Laboratory (EVL)

- 27 years at UIC
- Joint program: UIC EECS and Art
 - Directors Tom Defanti CS, Dan Sandin ART
- 50 graduate students
 - 30 EECS 20 ART
- Both scientific research and art exhibition
 - develop the medium and the content
 - over 1 Hundred art shows

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CAVE Research and Development



- 1992—Prototype CAVE
- 1993—10'x10'x10' CAVE
- 1994—SIGGRAPH VROOM
- 1997—100 CAVES and derivatives worldwide
- 1997- ... NSF funding for CAVERN and new desktop VR devices for the Grid, STAR TAP and NCSA
- 2001 - BAT CAVE

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BAT CAVE
Bright Advanced Technology

Super Bright Black Screen

- Better Color, better Contrast



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BAT CAVE

Super Bright Black Screen

- Mirage 5000 DLP Field sequential stereo



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Four Essentials of Virtual Reality

1. Surround vision

- Get close to the screen



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Four Essentials of Virtual Reality

2. Stereo

- 2 Display screens
- Multiplexing



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Four Essentials of Virtual Reality

3. Viewer-centered perspective

- First redefinition of perspective since the Renaissance



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Four Essentials of Virtual Reality

4. Interaction



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Caves in Art Museums

- Ars Electronica Center
 - Linz, Austria
- ICC
 - Tokyo, Japan

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Caves at Conferences showing art content

- Siggraph several times
- Super Computing several times
- ISEA
- Total Museum
- NAB
- and more

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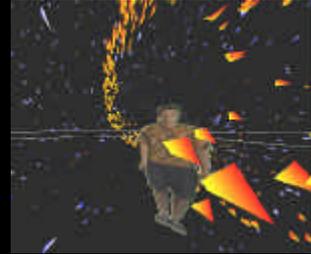
Caves art showings

- Artists working with CAVEs can Show there work in relatively small number of places
- EVL have shown at least 100 VR art works in the last 10 years

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Caves in Art Museums

- Gallery of Motions



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Caves in Art Museums

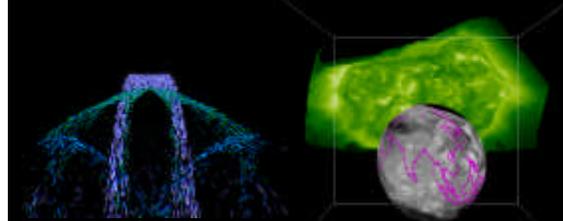
- From Death's Door to the Garden Peninsula



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Caves in Art Museums

- Looking for water AEC this fall
 - shared CAVEs



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Problems with Caves in Art Museums

- Cost too much
- Hard to maintain
- Too little throughput
- Glasses and tethered tracking systems
- Art museums think of VR Installations
- Not a medium, as in movies
- Innovation a negative

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Problems with Caves in Art Museums

- They cost too much money
 - \$1,000,000 US + remodeling
 - remodeling is highest cost
 - the Onyx is second
 - structure and projectors
 - trackers, wands etc

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Problems with Caves in Art Museums

- **Hard to maintain**
 - technical staff is required
 - museums have staff
 - conservators ,janitors, etc
 - so why not technical staff

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Problems with Caves in Art Museums

- **They have too little throughput**
 - around one person a minute
 - long lines
 - tickets
- **More problematic for the artist and audience is limited interaction**

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Problems with Caves in Art Museums

- **Art museums think Installations not a medium as in a movie theater**
 - move new content through the theater
 - there are many strong VR pieces that could travel between Museums
- **Innovation a negative ,Photo took 100 Yr.**

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Virtual Reality Displays for museums and galleries

- **ImmersaDesk**
 - 1994
 - meant for art galleries
 - shippable, AV ready
 - adjustable
 - still too expensive
 - otherwise very successful in art environments



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Virtual Reality Display for museums and galleries

- **ElsieDesk**
 - front projected
 - passive stereo
 - larger audience



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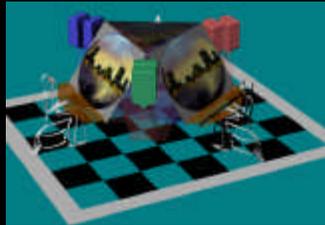
Full head tracked Stereo Wide angle of view (real VR)

- **Cost Estimate**
 - PC - \$5000-10000
 - polarization-preserving screen \$320
 - 2 DLP projectors - \$10000
 - 100 pairs of glasses - \$50
 - polarizing filters and projector mounts – \$1000
 - Wanda 3D Joystick - \$2560
 - tracker \$4,500 - \$10,000

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Virtual Reality Display for museum

- TryDesk , So Cheap why not 3
 - rear projected
 - passive stereo
 - one on one VR
 - Designs by Greg Dawe



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Varrier™ strip Auto-Stereo

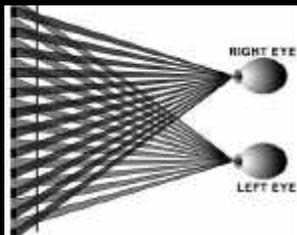
- No Glasses
- combine with video tracking



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Varrier™ strip Auto-Stereo

- Barrier strip method



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More VR in art contexts

- Encourage large art institutions to invest in infrastructure
 - equipment
 - technical staff
 - artist support
- Develop cheaper lighter weight easier to maintain VR display systems

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