

Trends in Human-Computer Interaction to Support Future Intelligence Analysis Capabilities

(Presentation #130)

16th ICCRTS
Québec, 21-23 June 2011

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Outline

- Military Intelligence Context / FIAC
- HCI Trends
 - Ubiquitous and Embedded Computing
 - Multimodal and Natural Interaction
 - Display Technology / Workstations
 - Smart Phones & Tablets
 - Collaborative Display Technologies
 - Smart Room Environments
 - Mixed Reality
 - Biometry
 - Augmented Cognition
 - Virtual Assistants
 - Advanced HCI Concepts and Techniques

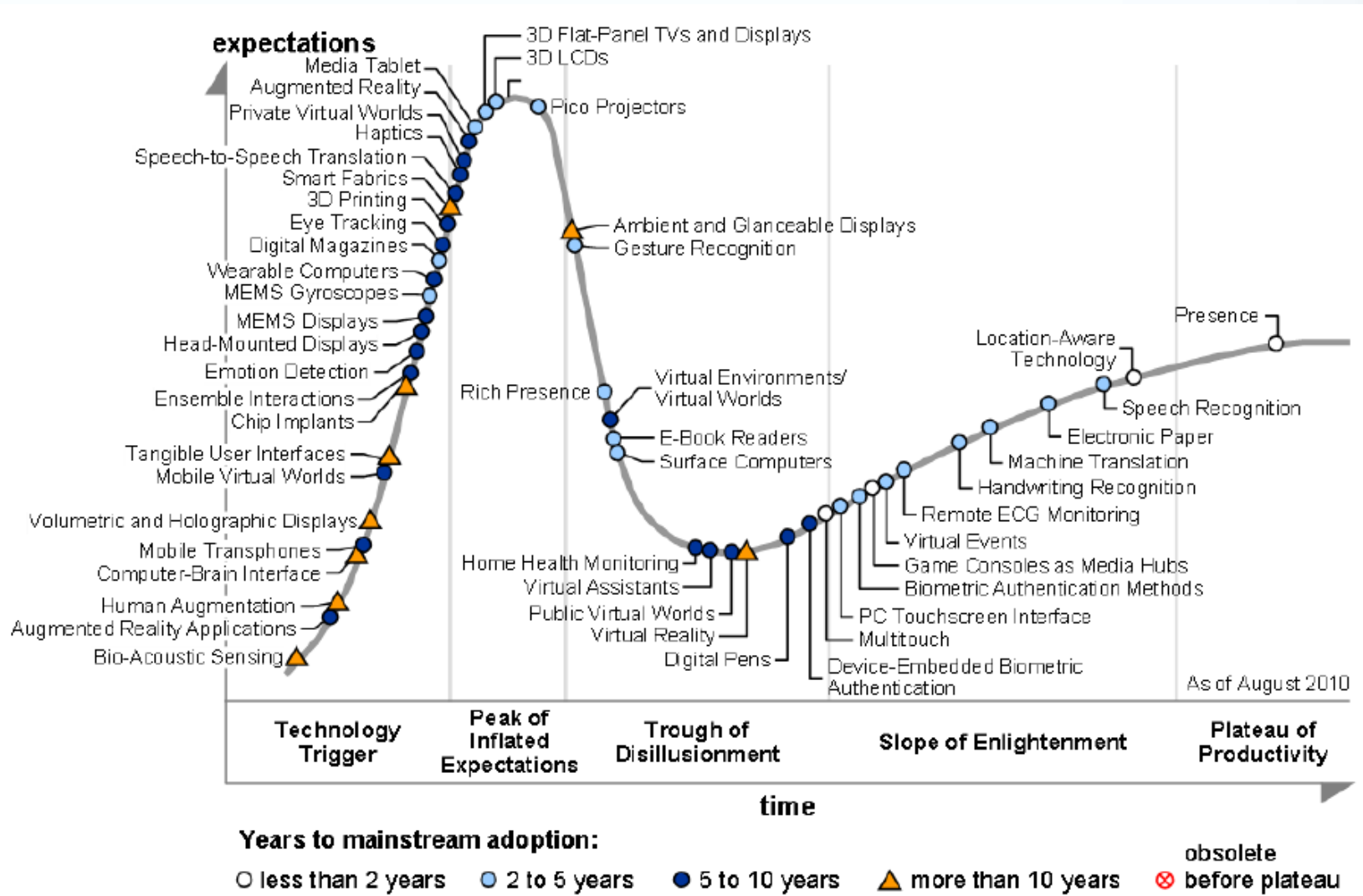
Modern Warfare

- Prevalence of asymmetric warfare
- Emergence of cyber warfare
- Instantaneous connections between the tactical and the strategic levels
- Increased linkages between the local, regional and global spaces
- Complexity and diversification of human terrains and contexts
- Conduct of Joint, Interagency, Multinational and Public (JIMP) operations
- Continued progression of Communication and Information Technology

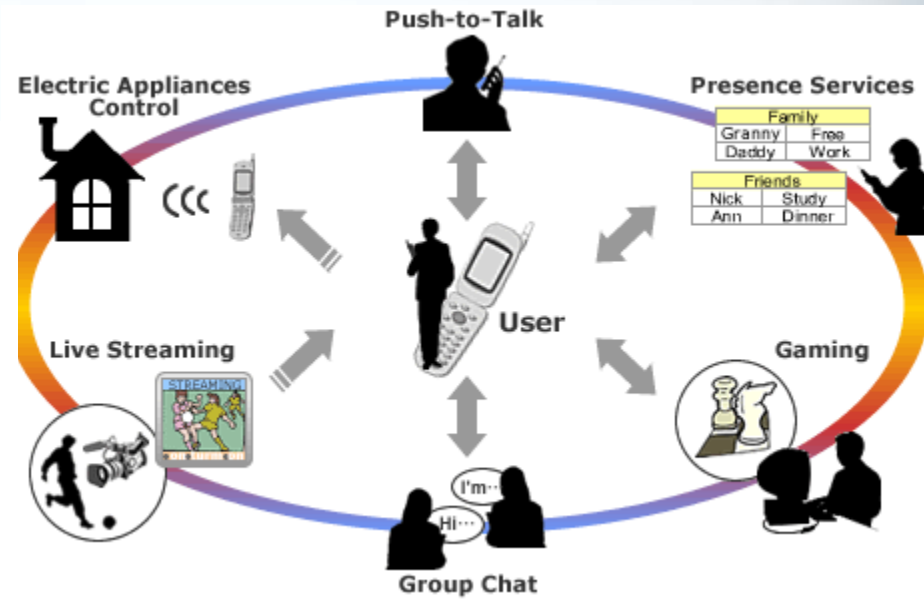
Future Intelligence Analysis Capability (FIAC)



Hype Cycle for Human-Computer Interaction



Ubiquitous and Embedded Computing



Multimodal and Natural Interaction

G-Speak (Oblong.com)



Xbox Kinect



WiiMotion Plus



DSTO LiveSpaces

Display Technology – Large Group Displays



Samsung LFD



Sharp LCD Video Wall



AFRL Interactive Data Wall



BARCO OV-1015 100" SXGA+

Display Technology – OLED / Flexible

Toshiba Demo at SID2010



Gummi Project



Sony's Rollable OLED display



Samsung SDI flexible display



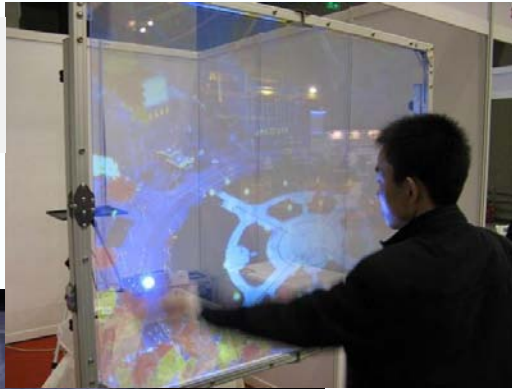
LG'S 19-in flexible display



ASU Flexible Display Center

Display Technology - Screenless Displays / Transparent – Head-Mounted / Retinal

Chinese Holo Screen



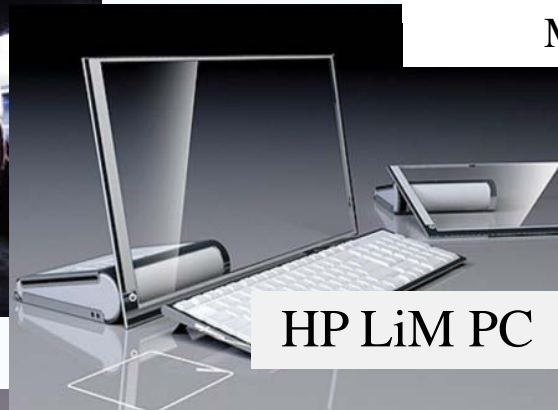
Pico Projectors



Microvision PEK and SHOWWX



FogScreen



HP LiM PC



EyeTap



Lumus Eyewear LOE



Head Mounted Display



HelioDisplay

Advanced Analyst Workstations



EvansOnline.com



zenviewdisplays.com

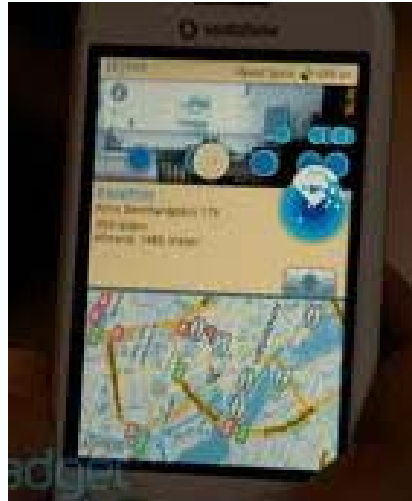


Gravitonus iclubby 4mt5e 52



BendDesk

Smart Phones & Tablets



www.engadget.com



Touch Inspect



www.pocket-lint.com



asf-mobiles.com



digicorner.org

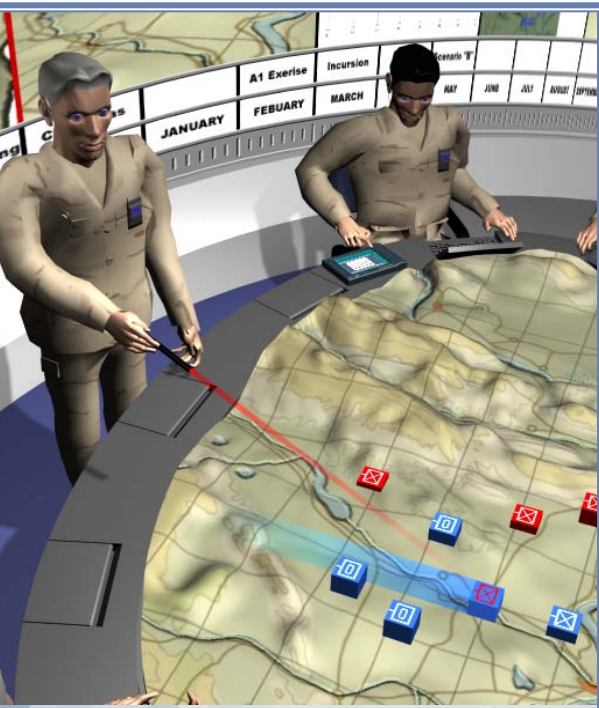
Collaborative Display Technologies



DVE Tele-presence



Braccetto collaboration stations



3D Terrain Models
(DARPA CPOF)



DiamondTouch Table

Microsoft Surface Computing

Smart Room Environments



US Navy Command Center of the Future (CCoF)



DSTO LiveSpaces



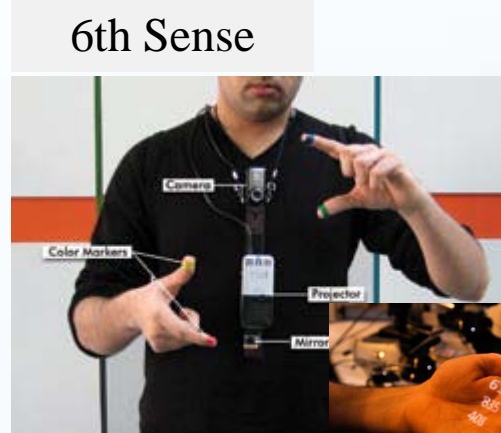
Shared displays Automatic lighting Video teleconferencing

Re-configurable table Smart whiteboards Personal computers

Mixed Reality



augmented-reality.com



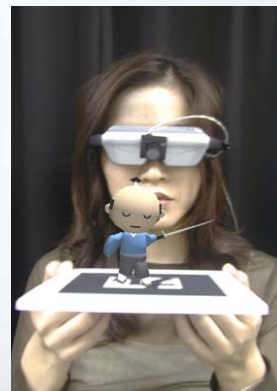
EarthMine



Wikitude



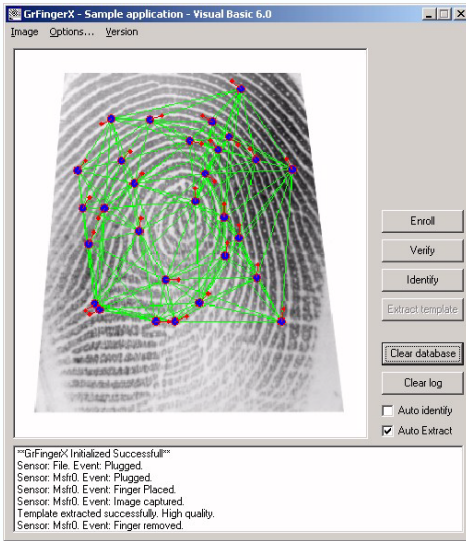
Arcane Technologies
Mirage



vrealities.com



Biometry



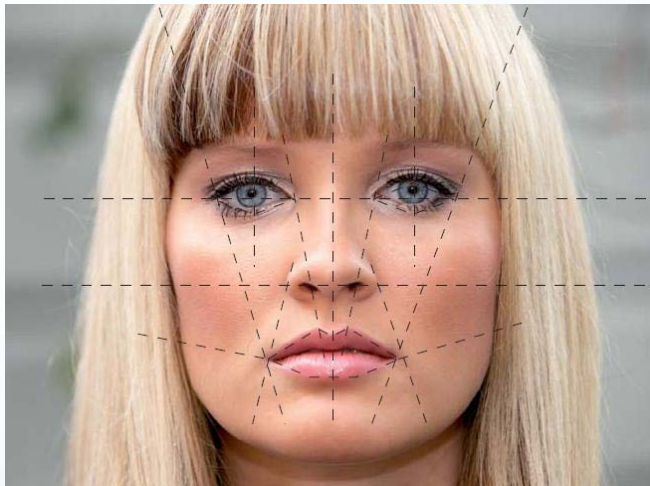
www.lisisoft.com



www.dealspwn.com



www.handresearch.com

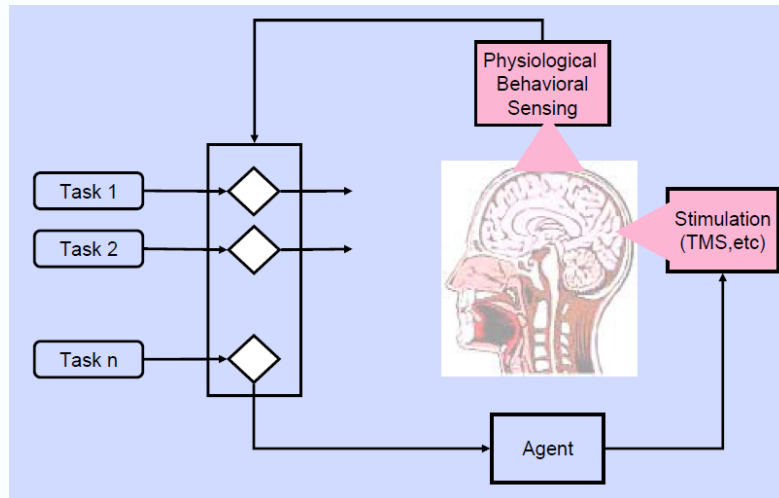


www.biometry.com



Vein pattern palm reading by Fujitsu

Augmented Cognition / Brain Computer Interfaces



Emotiv EPOC



http://web.cecs.pdx.edu/~strom/onr_workshop/pavel.pdf



NeuroSky MindSet



OCZ Technology Neural Impulse Controller

Virtual Assistant / Virtual Advisor



DARPA's CALO
Cognitive Assistant
that Learns and
Organizes

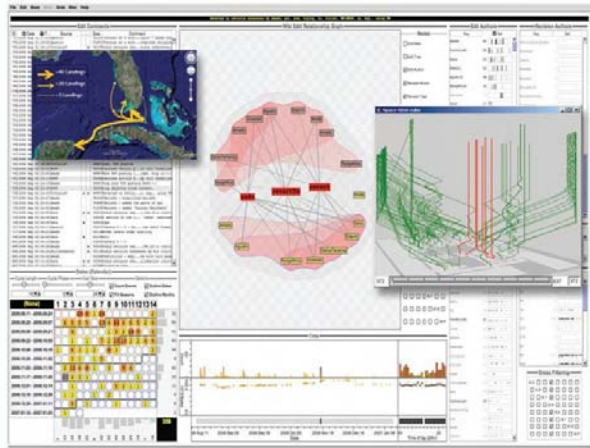


IBM's Watson supercomputer

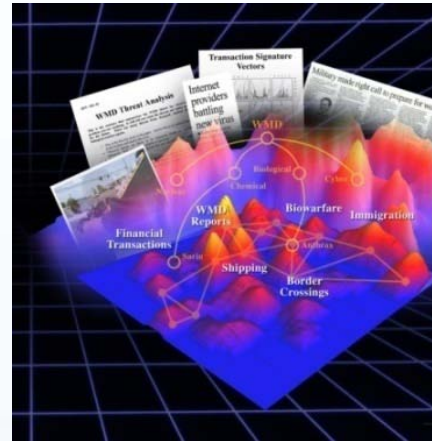


Pubmed Faceoff

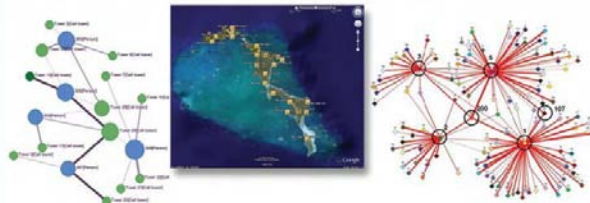
Advanced HCI Concepts & Techniques



Visual Analytics

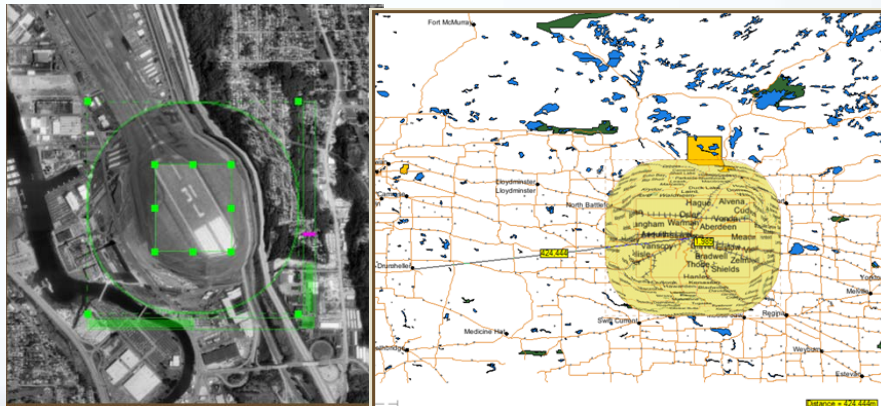


NVAC/PNNL
IN-SPIRE

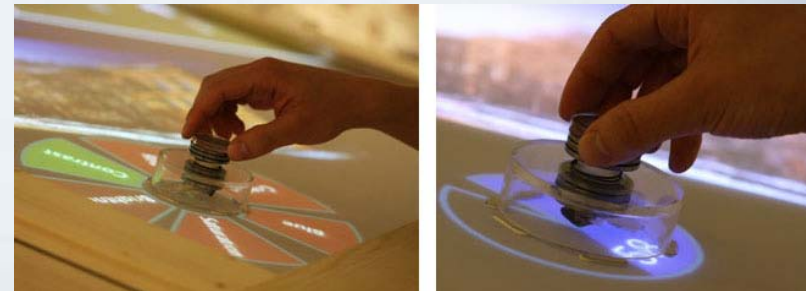


VAST(2008)

Smart Lenses



Advanced Interface Widgets



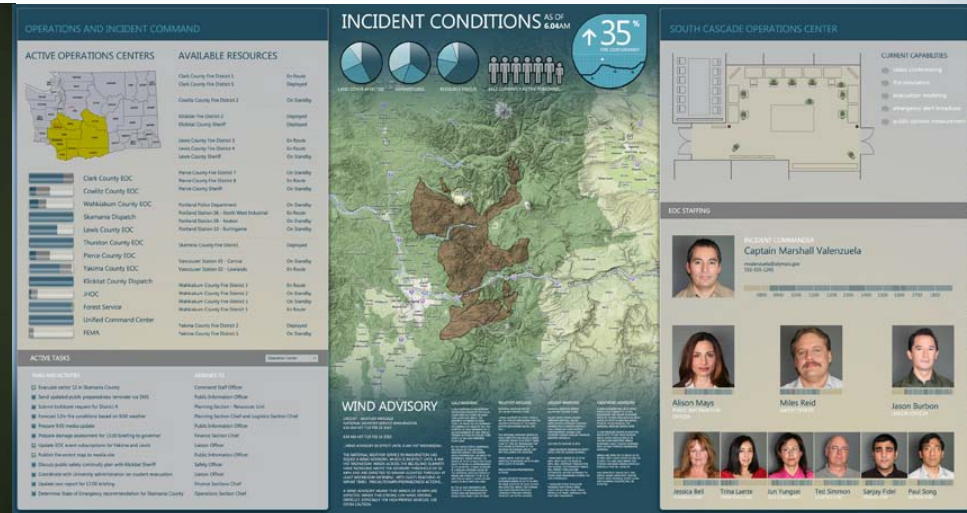
Slap Widgets (Weiss, 2009)

Advanced HCI Concepts & Techniques

www.precisioninformationenvironment.org



Intelligent / contextual desktops



Smart dashboards



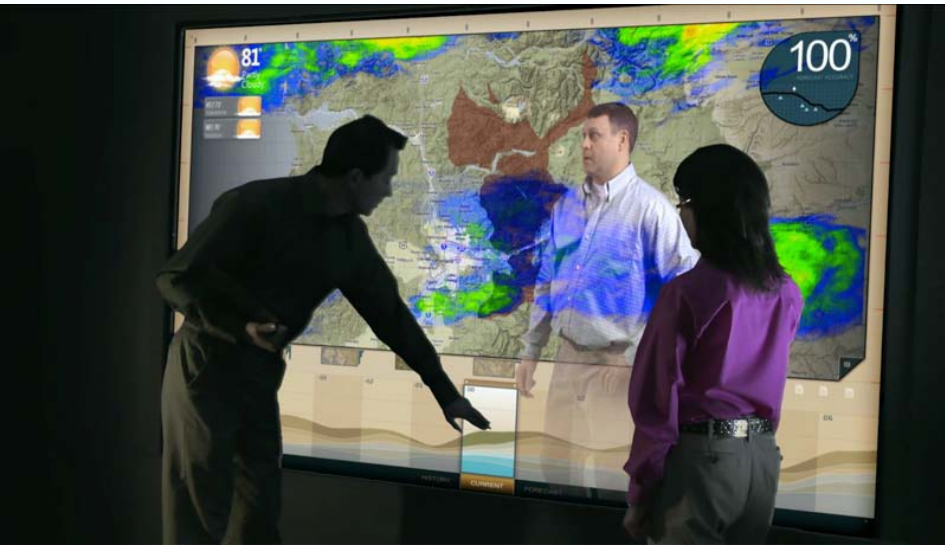
Gesture-based drag-and-drop



Surface computing collaboration

Advanced HCI Concepts & Techniques

www.precisioninformationenvironment.org



Live wall distributed collaboration



Advanced HCI widgets



Wearable displays



Ubiquitous Computing / Novel Devices

Conclusion

- Complex military operations
- Huge amount of information to process
- Need for collaboration
- Continued HCI Trends
 - Ubiquitous communications and computing will expand
 - Technology more accessible, intuitive and less restrictive
 - Multimodal and natural interaction, the common interface of the future
 - Smart phones / tablets with increasing intelligent applications
 - Systems will be designed with intelligent and adaptive interfaces
 - Smart room environments to enable better SA and collaboration
 - Advanced visual analytics to derive insight, identify patterns and trends
 - Virtual / synthetic environments to predict situations



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