Trends in Human-Computer Interaction to Support Future Intelligence Analysis Capabilities
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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)
Ubiquitous and Embedded Computing

http://withfriendship.com/user/levis/ubiquitous-computing.php
Multimodal and Natural Interaction

G-Speak (Oblong.com)

Xbox Kinect

WiiMotion Plus

AFRL Interactive Data Wall

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

LG’s 19-in flexible display

Sony’s Rollable OLED display

Toshiba Demo at SID2010

Gummi Project

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
- FogScreen
- EyeTap
- HelioDisplay
- HP LiM PC
- Pico Projectors
- Microvision PEK and SHOWWX
- Lumus Eyewear LOE
- Head Mounted Display
Advanced Analyst Workstations

EvansOnline.com

zenviewdisplays.com

Gravitonus iclubby 4mt5e 52

BendDesk
Smart Phones & Tablets

www.engadget.com

Touch Inspect

www.pocket-lint.com

digicorner.org

ASF-mobiles.com
Collaborative Display Technologies

- DVE Tele-presence
- 3D Terrain Models (DARPA CPOF)
- Braccetto collaboration stations
- DiamondTouch Table
- Microsoft Surface Computing
Smart Room Environments

US Navy Command Center of the Future (CCoF)

DSTO
LiveSpaces
Mixed Reality

Real Environment  Augmented Reality (AR)  Augmented Virtuality (AV)  Virtual Environment

Arcane Technologies Mirage

6th Sense

EarthMine

augmented-reality.com

Wikitude

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

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

- NeuroSky MindSet
- OCZ Technology Neural Impulse Controller
- Emotiv EPOC
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

Smart Lenses from Idelix (Baar and Shoemaker, 2004)

Slap Widgets (Weiss, 2009)
Advanced HCI Concepts & Techniques

Intelligent / contextual desktops

Smart dashboards

Gesture-based drag-and-drop

Surface computing collaboration

www.precisioninformationenvironment.org
Advanced HCI Concepts & Techniques

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