Mission Space

Value-based use of augmented reality in support of critical contextual environments

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Introduction
- Who is Concurrent Technologies Corporation (CTC)?

CTC’s Immersive Environments
- Objectives

Mission Based Utilization
- Object Recognition & Heterogeneous Data
- Story Telling & Information Sharing
- Mixed Reality Intelligent Collaboration
- Mission Training

Summary and Q&A
Concurrent Technologies Corporation (CTC) is an independent, nonprofit, applied scientific research and development professional services organization. Together with our affiliates, we leverage research, development, test and evaluation work to provide transformative, full lifecycle solutions.

Enterprise Ventures Corporation (EVC) is CTC’s technology commercialization arm and organized as a wholly owned for-profit affiliate of CTC. EVC transfers advanced technologies designed and created by CTC and others to the industrial base.

CTC Foundation is a conduit for giving. Donations go to educational institutions, the arts, and charitable and community-service groups throughout the United States.
Our reach is broad; our areas of expertise, diverse. Clients can take advantage of a wide breadth and depth of core services available through CTC’s science, engineering, and technology professionals.
CTC’s Immersive Environments Augments Human Reality

- How can we augment human capabilities by blurring the line between physical and digital worlds?
- How can we sense and adjust to user context, enhancing real-time situational awareness?
- CTC is investing R&D funds to build on our immersive multi-intelligence analysis and visualization capabilities to develop blended reality solutions that enhance human performance.
- CTC’s Virtual Human Terrain Scenario Training Program replaces live training exercises with computer-generated avatars.
Immersive Environments: An Architecture Concept

Structured Data
Imagery / 3D Foundation Data

Data Scientists
Data Factory
Normalized Metadata Repository

Data Profiles

Unstructured Data
Dynamic / Contextual Data

Immersive Environments: Data Engine

Immersive Environments Services

Data Processing
Computer Vision Service
Predictive Analytics Service
Cognitive Computing Service

Data Fusion
World Building Service
Annotation Service
Machine Learning Service

Immersive Environments Services

Cognitive Computing Service

Machine Learning Service

Augmented Reality / Holographic Immersion
Mobile / Wearable Platforms

Personal Immersion

Physical Immersion

Fielded Augmented Reality

Fielded Virtual Reality

RESTful Web Service API

Edge Device API

IBM Watson

Edge Devices

Fielded Immersion

Augmented Reality / Holographic Immersion
Mobile / Wearable Platforms

Immersive Environments Service

Data Processing

Data Fusion

Normalized Metadata Repository

Dynamic / Contextual Data

Unstructured Data

Structured Data

Imagery / 3D Foundation Data

Data Scientists

Data Factory

Data Profiles
CTC’s Mixed Reality Approach

Mixed Reality (MR)

Real Environment

Augmented Reality (AR)

Augmented Virtuality (AV)

Virtual Environment

- Augmented Reality – Real-world environment is augmented (overlaid) with digital components
- Virtual Reality – Simulated environment is augmented (overlaid) with digital components
Technologies are more capable than ever of providing user context, how can they play well together……..

...endless possibilities to provide unique solutions
Immersive Environments

Clip #1
Object Recognition & Heterogeneous Data
Immersive Environments

Clip #2
Story Telling & Information Sharing
Immersive Environments

Clip #3
Mixed Reality Intelligent Collaboration
Immersive Environments

Clip #4
Mission Training
CTC’s Immersive Environments Platform is developing solutions to:

- Support our clients with training as they address hazardous environmental and human health impacts in operations,
- Ensure improved utilization of resources for our clients whilst ultimately improving safety, financial and mission operational outcomes, and thereby
- Supporting:
  - Improved productivity,
  - Simplified Workflow and Processes,
  - Valuable and engaging experiences with physical world, and
  - Real-time access to rich heterogeneous data sets.

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Enterprise AR at AWE 2016
Questions?
Definition
- A simulation that produces a state of being deeply engaged; suspension of disbelief; involvement (Naval Research Advisory Committee)

Immersive Training Environment
- Training environment that includes one or more aspects of simulation (ranges from a few special effects up to a full virtual world) that deeply engages the trainee (Naval Research Advisory Committee)

CTC’s Immersive Environments
- Blur line between physical world and digital or simulated world, thereby creating a sense of immersion
  - Perception: Vision, Auditory, Tactile, Olfaction, Gustation
  - Interaction: Gesture recognition, Brain-Computer Interface, Speech Recognition, Omnidirectional Treadmill
Technology platform is focused on providing the “Edge” by blurring line between physical world and digital world thereby augmenting human capability.

- Wearables, Monitor state-of-the-art developments in Immersive Environments Ecosystem
  - Wearables, Display Technologies, Sensors, Triggers, Data Ecosystems
  - Augmented reality emphasis

- Focused on developing a set of software services that can be aggregated into a variety of solutions for multiple environments
  - Hardware agnostic and open source integration