RELEVANT PAST PROJECTS

Michael A. Carney

- Title: **Canon MREAL System for Mixed Reality:**
  High Risk Training Initiative
  Partner: Design Interactive,
  Funding Amount: Confidential at this time.
  Date: 2014 - Current
  Level of involvement: Project Manager, Mixed Reality System Integration Consultant
  Abstract: Canon contracted Design Interactive (DI) to produce scenarios and tool enhancements to help drive adoption of Mixed Reality technologies within the High Risk Training and Simulation markets. In this project I mentored DI on both the technical aspects of setup and configuration with the MREAL system and HRT conventions and best practices in Mixed Reality environments. I worked closely with DI to define project scope and deliverables. Working with Canon resources, I managed technical challenges and guided scenario and tool development through the Quality Assurance process.

- Title: **Embraer North America: Canon MREAL System for Mixed Reality:**
  Production of Next-generation Aircraft
  Sponsor: Space Florida
  Funding Amount: $414,976
  Date: 2014 - Current
  Level of involvement: Bid Response / Mixed Reality System Integration Consultant
  Abstract: Embraer is utilizing Mixed Reality in two distinct ways. First, the engineer team is reviewing aircraft CAD data in a physical space, allowing them to review parts in a real life scale. This will be used to develop their next generation aircraft. Second, the Embraer sales team is using the technology for a customer facing experiences. Prospective clients are able to walk through a virtual presentation of their customized executive jet before it goes into production. My activates included responding to the RFP, presenting the technology to the review board and integrating the technology and supporting Embraer's use after the award.

- Title: **Informing PAL development by connecting physical and virtual worlds through real world data capture using arduino sensors and ADL's xAPI: Phase 1**
  Sponsor: Army ADL Co-LAB
  Funding Amount: $117,028
  Date: 2013
  Level of involvement: Principal Investigator
  Abstract: This project aims to evaluate the potential usage of data streams for capturing informal learning experience across structured, semi-structured and non-structured learning environments. This first phase will use ADL's experience API to create data streams from real world sensors, learner experience and expert repositories.

- Title: **Water's Journey Through the Everglades**
  Sponsor: National Science Foundation
  Funding Amount: $3,130,001
  Date: 2007 - 2012
  Level of involvement: Project Manager and Creative Designer; assisted PI with exhibit design, delivery and research methodology.

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Abstract: Using emerging technology, specifically mixed and augmented reality, this project enhanced the free-choice learning field by using contemporary tools with innovative applications.
- Exhibits Included:
    - **Invasive Species**: Using Mixed reality, we imbedded virtual invasive plant and animal species into a live otter habitat. Users can experiment with eradication methods to see how they affect the environment over time.
    - **Human Encroachment**: Virtual native animal species, the key deer, Florida panther and black bear, populate a live otter habitat. Learners can manipulate human populations around the state to see how they affect animal populations.
    - **The Wet and Dry Season**: By changing the time of year, learners can manipulate a large scale top down projection of Florida. While exploring topics from wildfires to floods, they are able to compare historic, current and average environment conditions.
    - **Historical Geology**: While on a quest to unearth as many fossils as they can, learners can compare the sheer size of historic animals with themselves as they activate large scale projections as they discover bones in a virtual environment.
    - **Hurricane Storm Center**: In this two player experience, one learner creates a hurricane and the other creates a house. By exploring the different factors that go into each, learners can experiment with the real world outcomes to hurricanes. Storm data collected by NOAA was used to create our hurricane creation model.

- Title: **Virtual Technologies and Environment (VIRTE) for Advanced Research on Agents and Teams**
  Sponsor: US Army Research Institute
  Funding Amount: $2,137,500
  Date: 2009 - 2011
  Level of involvement: Project Manager
  Abstract: Using emerging technology, specifically mixed and augmented reality, this project enhanced the free-choice learning field by using contemporary tools with innovative applications. We created a proof of concept for a training scenario where fire support teams could practice their skills of calling fire support from a hilltop using only the tools they would have in the field – a map and a radio.

- Title: **Metaphor-Based Learning of Physics Concepts through Whole-Body Interaction in a Mixed Reality Science Center Exhibit**
  Sponsor: National Science Foundation
  Funding Amount: $963,369
  Date: 2011 - 2014
  Level of involvement: Creative Designer; worked directly with CO-PI to design public museum experience application.
  Abstract: This NSF AISL project is research the value of whole body movement combined with metaphor narrative to investigate whether it improves STEM learning for middle school age youth.

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- Title: **Incident Command Training & Assessment Simulator: Ensuring Protocol and Decision-Making Skills**
  Sponsor: Orange County Fire Rescue
  Funding Amount: $771,3000
  Date: 2012 - 2013
  Level of involvement: Creative Designer; worked directly with PI and CO-PI to design a fully immersive simulator, operator interface and overall experience design.
  Abstract: The simulator in this project acts as a rite of passage for incident commanders in training. It is the culminating event after course curriculum that places the commanders in an interactive virtual environment where they can command squads, react to fire progress based on real time simulations and manage dynamically changing resources.

- Title: **Emotional Reaction and Dysfluency among Adults who Stutter in a Mixed Reality Speech Situation**
  Sponsor: UCF Internal
  Funding Amount: $15,000
  Date: 2008 - 2009
  Level of involvement: Project Manager; collaborated directly with CO-PI on immersive scenario and testing metrics
  Abstract: This project placed adult stutters into a mix-reality environment that mimicked a real world environment which triggered their stuttering, a restaurant containing role playing customers, waiters and a hostess. The system used observational data to document the individual triggers for each participating stutterer.

- Title: **Mixed Reality Revitalization (MOUT 3.0)**
  Sponsor: RDECOM STC
  Funding Amount: $200,000
  Date: 2008 – 2009
  Level of involvement: Creative Designer, Production Manager, collaborated directly with PI on scenario design and creation.
  Abstract: This project was looking at Mixed Reality offering the unique ability to place soldiers within an immersive multimodal environment where they can gain experience honing situational awareness (SA) and decision-making skills.

- Title: **Mixed Reality Immersion Research**
  Sponsor: US Army RDECOM
  Funding Amount: $224,880
  Date: 2010 - 2011
  Level of involvement: Creative Designer; collaborated directly with PI on immersive scenario and testing metrics
  Abstract: This project was looking at whether a brain-computer interface could be used in a Mixed Reality training environment for both basic navigation and task-level decision making.

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- Title: **Space, Science & Spirituality**
  Sponsor: Templeton Foundation
  Funding Amount: $187,989
  Date: 2011 - 2013
  Level of involvement: Creative Designer; collaborated directly with CO-PI on immersive scenario and testing metrics
  Abstract: This project recreated the conditions astronauts' encounter during space flight. The aim was to evaluate feelings of awe and wondering while in a space environment. A fully immersive mock space capsule environment with virtual port whole windows, realistic blast off, space and landing audio and interactive computer system for simple tasking was created. The environment was designed to simulate the visual and auditory conditions seen during space flight.

- Title: **Evaluating the Impact of Mixed Reality on Human Performance and Interaction with Adolescents and Young Adults**
  Sponsor: NAVAIR Orlando TSD
  Funding Amount: $173,349
  Date: 2007
  Level of involvement: Project Manager and Experience Designer; collaborated directly with CO-PI on scenario design and production and immersive scenario and testing metrics
  Abstract: The research objective compared traditional sit down gaming environments with fully immersive experimental mixed reality environments. The goal was to discover whether a Mixed Reality interface reduced the success delta between gamers and non-gamers within a 13-17 year old participant population.