

CCC COUNCIL MEETING

March 25th, 2019



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AGENDA

- Welcome and Introductions
- Task Forces
- Industry Working Group
- BREAK
- AAAS Recap and Next Year
- Discussion
- LUNCH
- Artificial Intelligence
- New Initiatives
- BREAK
- Report from NSF
- Next Steps
- Adjourn



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INTRODUCTIONS / GENERAL UPDATES



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TASK FORCES



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CYBERSECURITY AND CYBERCRIME

- Code 8.7 Workshop and Next Steps
- Leadership in Embedded Security Report

HEALTH AND HUMAN COMPUTER INTERACTION

- Content Generation for Workforce Training, 3/19
- Addiction Workshop, 11/19



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Content Generation for Workforce Training

March 14-15, 2019



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Workshop Goal:

Define a computing research agenda to support the development of tools for workforce training.

26 Participants (+ CCC Staff):

- Currently engaged in workforce training -- gov't and commercial
- Currently engaged in education/training research
- Currently engaged in VR/graphics/HCI research

Examples -- Centers for workforce training

Erik Verlage



AIM ACADEMY
photonics

Educational Simulations and E...
for Workforce Training in

AIM ACADEMY
photonics

Oui

American Institute for Manufacturing (AIM) Photonics

Technology Development

- Applications in data centers, sensing, autonomous vehicles, and more



People Development

- Education and workforce development at MIT



This is AIM Academy



Chuck Spangler



SC MEP
SOUTH CAROLINA
MANUFACTURING
EXTENSION
PARTNERSHIP

HELPING SOUTH CAROLINA COMPANIES GROW

Nationwide MEP Centers



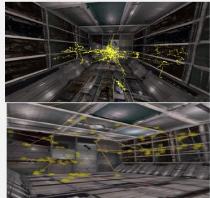
Examples -- Training research



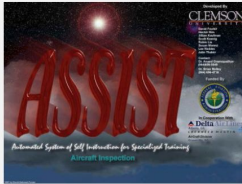
Kapil Chalil Madathil

- ≡ CUCWD
- ≡ 2019 CCC Workshop

Two decades of VR development



Virtual Reality Technology for Aircraft Visual Inspection



Automated System of Self-Instruction for Specialized Training (ASSIST)



Actual Cargo Bay Virtual Environment for Visual Se

1999



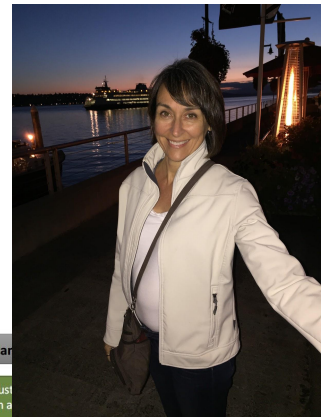
2003



2004



Louise Yarnell



AR Mentor Example

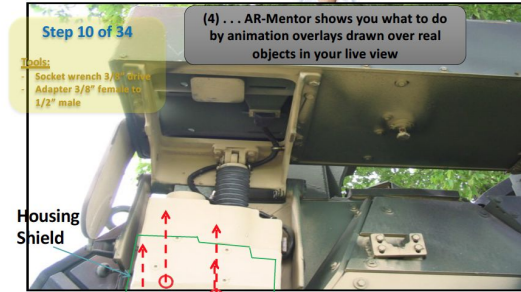
- (1) Head-up Hands-Free**
- Glasses with See-through Display for seeing directions
 - Head-phone for giving direction
 - Mic for listening to user
 - Sensors for observing user



(2) User can

I want to Adjust switch on a

(3) AR-Mentor Talks back to soldier . And...



(4) . . . AR-Mentor shows you what to do by animation overlays drawn over real objects in your live view

Remove the 4 screws highlighted in red from the housing shield (highlighted in green)

Remove shield from the housing (highlighted in green)

Warning: Missile Launcher, in the up position, can fall rapidly and injure personnel. Stay clear of the launcher path when launcher is up. Stand in front of gunner's sight when manually raising or lowering launcher

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SRI Education™

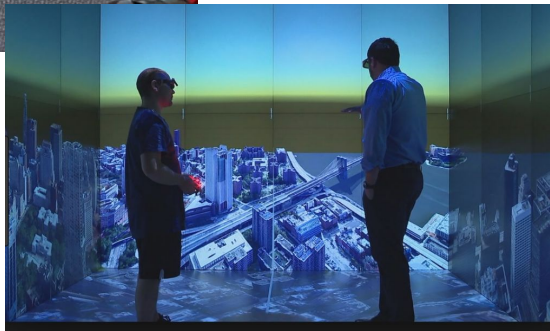


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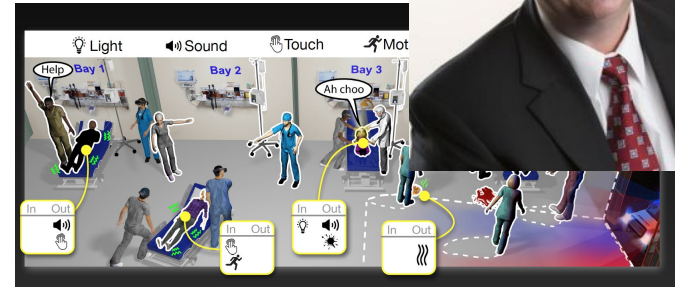
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Examples – VR research

Carolina Cruz-Niera



Greg Welch



TeachLive—A “Flight Simulator” for Teachers
(Dieker, Hynes, Hughes, et al.)



Content Generation for Workforce Training – Results

Demand for Training ->

Learning System Design Needs ->

Technical Research Needs



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Content Generation for Workforce Training – The Demand Exists

Manufacturing
Health Care
Construction ...

Veterans' transition to civilian employment
Personalized, more inclusive training
Accessible to small businesses
Training of teams
Transferring expertise

Government has already invested in training centers



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Content Generation for Workforce Training – Research Issues – Learning System Design to Address Demand

1. More efficient ways to elicit knowledge from both SMEs and existing technical documentation.
2. Guidelines for determining how many XR elements provide “just enough” support to facilitate learning.
3. Tools for embedding assessments and analytic tools into XR learning experiences to support personalization and ongoing evaluation.
4. Entry points into existing XR materials so they may rapidly update and locally adapt that content.

...

Content Generation for Workforce Training – Research Issues – Technical Research to Support Learning Systems

1. Multimodal capture (vision, audio, haptic) to annotated performance of tasks.
 2. Establish levels of realism (visual/audio/haptic) and simulation required for different training types
 3. Procedural content specification with controls over fidelity and systems performance (in contrast to demands of game/feature film).
 4. Multi-user systems for team training – unique networking requirements.
- ...

INFORMATION INTEGRITY AND PROVENANCE

- Misinformation Roundtable tomorrow!



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INTELLIGENT INFRASTRUCTURE

- Collaboration with GCTC



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FAIRNESS AND ACCOUNTABILITY

- Economics and fairness workshop
 - May 22-23rd, 2019



SYSTEMS AND ARCHITECTURE

- Workshops Run & Reports Done
 - Thermodynamic Computing, 1/19
 - Working on report
- Upcoming: Wide-Area Data Analytics workshop



INDUSTRY ENGAGEMENT: TRANSPORTATION

- Report and Next Steps



Industry Working
Group
Interim Report
Report

Significant trends in increased faculty engagement with industry

- Impact on teaching mission
 - Undergrads
 - Grads
 - Academic pipeline
- Impact on the research agenda
 - Shift from long term to short term
 - Connection to availability of data, resources
 - Driven by market
- Understanding the potential for conflicts

Questions Raised by Interim Report

- More data gathering needed
- Questions
 - Is this a real trend?
 - How much influenced by geography?
 - Impact by research area
 - Lasting trend or only short-term impact?
 - What is the real impact on undergraduates?

Next Steps

- Get more input based on feedback from the interim report
- Data collection – how much, when, how?
- Gather current practices, document arrangements, mitigations
 - Shwetak has been working on this
- Understand new / effective methods of engagements between industry/academia
 - Lablets
 - Company initiatives with universities
 - Shared competitive challenges

BREAK



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AAAS

- AAAS 2019
 - P7: A New Paradigm for Health Care in the 21st Century
 - Socio-technical Cybersecurity: It's All About People
 - Sustainably Feeding Ten Billion People
 - Cybersecurity: Transcending Physics, Technology, and Society
- AAAS 2020
 - Submissions due April 18th
 - Theme “Envisioning Tomorrow’s Earth”
 - Location: Seattle, WA
 - Date: Feb 13-16, 2020

Ideas?

DISCUSSION



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LUNCH



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AI ROADMAP PROCESS

- W1: Integrated Intelligence
 - *Chairs: Marie desJardins and Ken Forbus*
 - Understanding the mind
 - Composing intelligent capabilities
 - Open repositories of knowledge
- W2: Interaction (Jan 8-9)
 - *Chairs: Kathy McKeown and Dan Weld*
 - Interactions that matter
 - Trust and responsibility
 - People interacting online
- W3: Learning and Robotics (Jan 17-18)
 - *Chairs: Tom Dietterich and Fei-Fei Li*
 - Deeper learning
 - Integrating statistical learning and symbolic representations
 - Diversified learning modalities
- AAI Town Hall (Jan 28)
- Draft of executive summary posted (mid-March)
- Drafts of workshop reports and recommendations to CCC for review (early April)
- Feedback telecon (Apr 9)
- Draft released for broader comment (mid-April)
- Final release (May)



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Bart Selman, Cornell



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New Initiatives

- CS for Social Good
- FCRC
- New Visioning Proposal
- Engagement
- etc.

BREAK



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JIM KUROSE, NSF



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Next Steps



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New Council Members Joining July 1st!



Elisa Bertino, Purdue
Information Security and
Database Systems



Sujata Banerjee, VMware
Software Defined Networking



Katie Siek, Indiana University
HCI



Tom Conte, GA Tech
Architecture, optimization



Chad Jenkins, University of Michigan
Robotics



**Melanie Mitchell, Portland State
University**
Artificial Intelligence



Maria Gini, University of Minnesota
Robotics

Elisa Bertino Named 2019-2020 ACM Athena Lecturer

ACM has named Elisa Bertino of Purdue University the 2019-2020 Athena Lecturer for pioneering and impactful contributions to data management and data security theory and systems, along with outstanding contributions to broadening participation in computing via professional leadership and mentoring. Bertino is recognized as one of the top database security experts worldwide, and has made contributions to data security and privacy in many different contexts and perspectives including context-based access control, digital identity management, data integrity, Internet of Things and sensor network security, secure and privacy-preserving provenance, privacy-preserving analytics, protection from insider threats, and cloud security. Bertino is also an outstanding educator and mentor, who has been especially active in encouraging young women to pursue careers in computing. Bertino is the Samuel Conte Professor of Computer Science at Purdue University, where she also heads the Cyber Space Security Lab.



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