



IST, School of Modeling
Simulation and Training

UNIVERSITY OF CENTRAL FLORIDA

Department of Computer Science

College of Engineering and Computer Science@UCF

Charles Hughes

**Professor: Computer Science,
ECE, ED, GAIM, SMST**

Interim Director: SMST Grad Programs

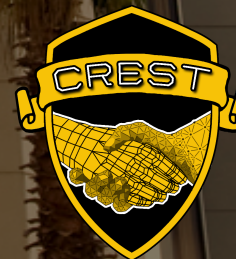
Co-Director: SREAL

Co-Director: TeachLive/CREST

Co-Lead: Learning Science FCI

Members: Disability, Aging, Techn. FCI

sreal
synthetic reality lab



teach live

Who I am Academically: The Early Days

- 1962 as a programmer at [RCA Aerospace](#) (long gone)
 - Validation of [BMEWS](#) software on a [Friden Desk Calculator](#)
 - Radix sorting via wiring an [IBM 082 card sorter](#)
 - Fortran on [IBM 7090/7094](#);
 - Assembler on [IBM 1401/1410](#);
 - Pin board coding on [Burroughs E101](#);
 - Various Fortran software for [Lunar Excursion Module](#)
 - Software for automatic test equipment – [mylar tape](#)
 - Microcode to emulate IBM 7094 and [AN/UYK-1](#) computers
- 1966 as a programmer at [Advanced Research Laboratory](#)
 - Worked on [Mark 48](#) torpedo acoustic interference

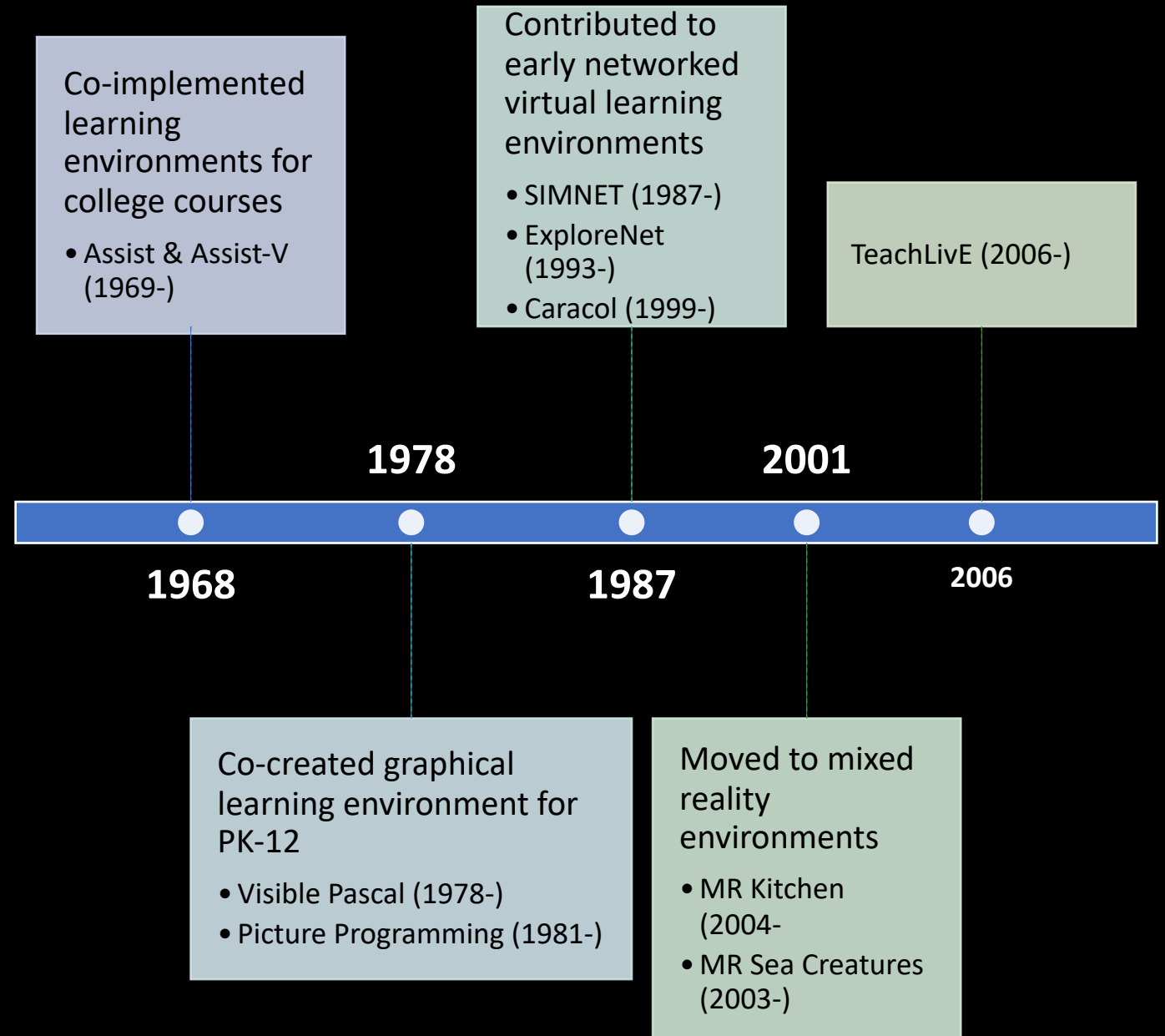
Who I am Academically: The 70s, Early 80s

- NRC Postdoc and then Taught at Penn State, Tennessee
 - Research on Operating Systems, Data Flow Analysis, Computability
 - Computability stuff can be seen at [Google Scholar](#) page
 - Developed [ASSIST-V](#) virtual machine simulator for IBM 360/370
 - Developed [source level optimizers](#) based on interval analysis
- Moved to UCF in 1980
 - Software Environments, usually for K-12
 - [Computer Power](#)
 - [Visible Pascal](#)
 - [Picture Programming](#)
 - [Formula Vision](#)
 - [Action Graphics](#)

Who I am Academically: Late 80s and 90s

- Moved back into simulation but now through VR
 - [SIMNET](#) – network protocols; [dynamic terrain](#)
 - [Real-Time Fluid Flow](#)
- But stayed mainly focused on learning environments
 - [Virtual Academy](#)
 - [ExploreNet](#) – Shared virtual worlds for youth
 - [Caracol Project](#)
- Also Had Fun with Parallel/Distributed Processing
 - [Constraint Logic Programming](#)
 - [View Centric Reasoning](#)
 - [Tuple Spaces](#)
 - [Lazy versus Eager Semantics](#)

My Evolution to Virtual Learning Environments



Who I am Academically: MR in 2001-2010 Decade

- MR via Canon Video See-Through HMD
 - [Time Portal](#) -- Entertainment
 - [MR MOUT](#) – Situational Awareness
 - [MR Sea Creatures](#) – Free Choice Learning in Science Centers
 - [MR Kitchen](#) – Cognitive Rehabilitation
- [Environmental Economics](#) – Support for Public Policy
- [Digital Preservation of Culture](#) – Shadows of Canaveral

The Current Fun I have

- SREAL: Synthetic Reality Laboratory
- TeachLivE: Teaching and Learning in a Virtual Environment
 - Teacher Prep
 - Protective Strategies
 - De-Escalation Skills
 - Non-Suicidal Self-Injury
 - Social Skills, especially for kids with ASD
 - Emotional Responses in Virtual Learning Environments
- Learning Sciences

Examples of Different Ways TeachLive Can Be Used to Help Prepare Educators





Inclusive Classrooms



Peer Tutors



Parents, Administrators, Witnesses, Interviewers/Interviewees, NSSI, Non-Escalation/De-escalation



Human-in-the-Loop Puppeteer Controls up to 6 Avatars



Can Control Robots with Same Gesture-Based Protocol

Participant's View



Surrogate's View



Inhabiter Interface



ZOOBEE'S WORLD



PROJECT
RAISE 

AI Companions used for
Coaching/Calming

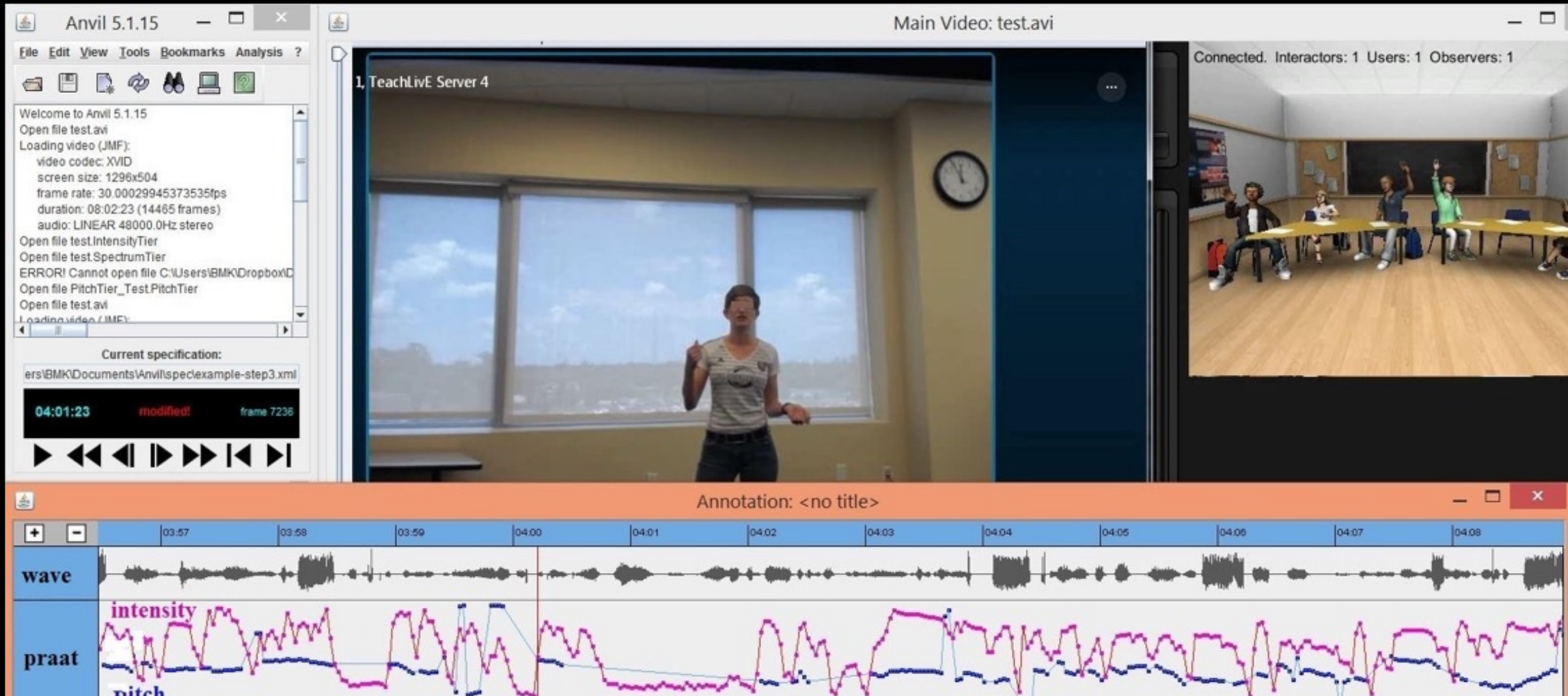


teach live 



AI Companions to give advice on Cyberbullying & Personal Information Disclosure





Non-Verbal Messaging (posture/vocalization)





8,365 face images from
EmoReact dataset

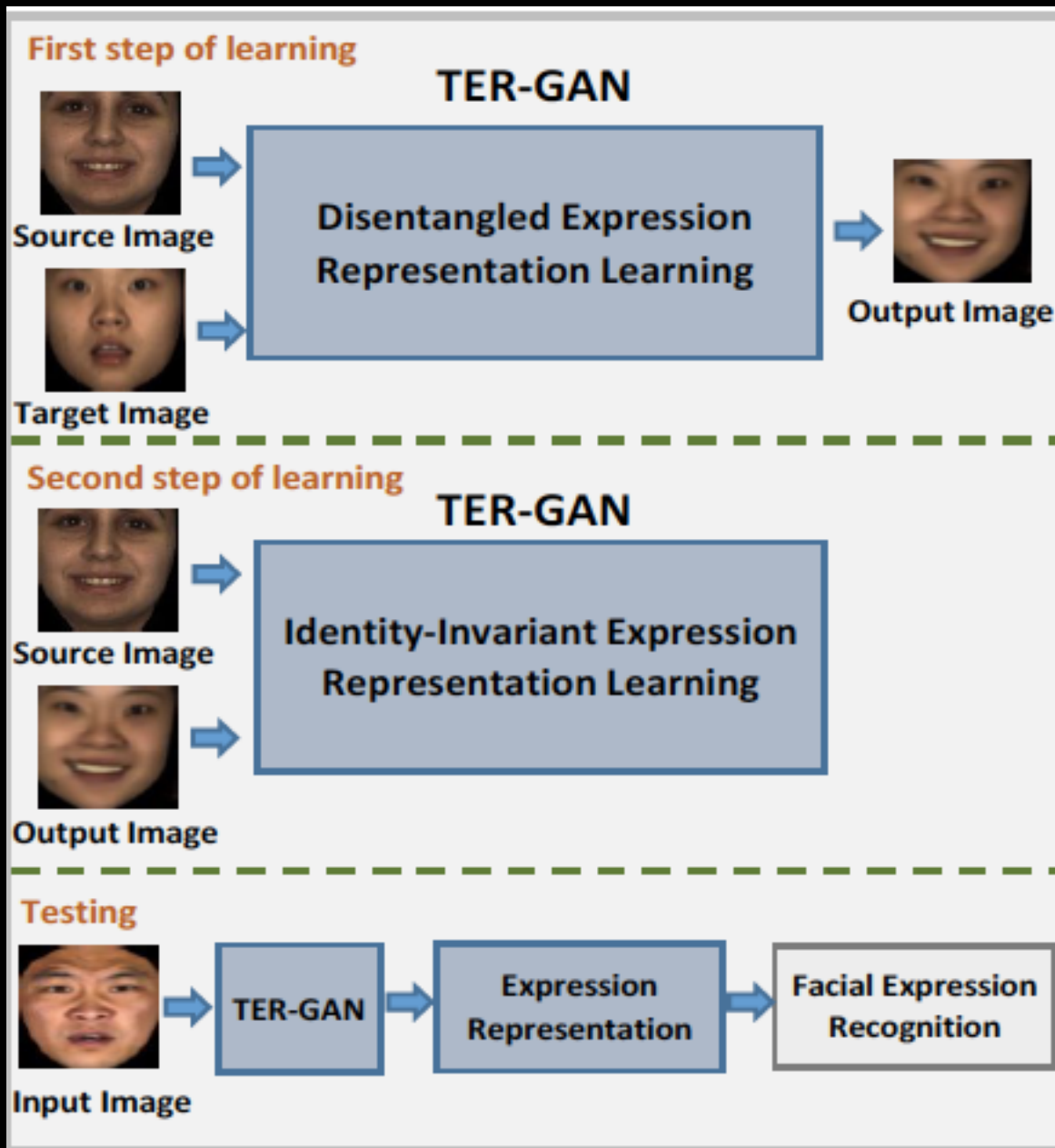
- 4,003 non-occluded faces
- 4,362 occluded faces
- Generate other examples based on real images

Goals:

- Learn a representation
- Train an algorithm to recognize occlusions

Facial Occlusion Recognition

Facial Expression Recognition: Disentangling Identity from Expression



Nonverbal Health
Situational Instructional
Management
Protective
Peer-to-Peer
lassroom
Debriefing
Cessation
Co-teaching
Messaging
Coaches
Tutoring
Micro-credentials
learners
Bullying
Sexuality
Bias
Implicit
Delivery
Diversity
Pedagogy
Recognition
Micro-credentials
Pedagogy
Diversity
Conversation
Cognitive
Emergency
Nursing
Error
Fundraising training
Neurophysiological
Skills
Judgement
English
Practice
Mindfulness
Pre-suicide
Educat
Feedback
Intervie
Content
GTA
Smoker
Autism
Good
Workforce
Strategies
Patterns
Hospitality
Training

