

What is ACCORDS?

Adult and Child Center for Outcomes Research and Delivery Science

ACCORDS is a 'one-stop shop' for pragmatic research:

- A multi-disciplinary, collaborative research environment to catalyze innovative and impactful research
- Strong methodological cores and programs, led by national experts
- Consultations & team-building for grant proposals
- Mentorship, training & support for junior faculty
- Extensive educational offerings, both locally and nationally



ACCORDS Upcoming Events – mark your calendars!

December 4, 2024 AHSB Room 2002 3:30-5:00pm MT	Transforming and Advancing a Learning Health System: Multiple Perspectives for Mutual Gain Improving Infectious Diseases Care in Utah: 10 Years in a Learning Health System <i>Presented by Edward Stenehjem, MD</i>
December 9, 2024 AHSB Room 2200/2201	Emerging Topics in Digital Health & Clinical Informatics <i>Presented by Annie Collier, PhD</i>
February 2025	*New Workshop* ACCORDS/CCTSI Pragmatic Research Planning Workshop. Registration live on ACCORDS webpage!
Annual Conference June 4-5, 2025 9:00-3:30pm MT	Colorado Pragmatic Research in Health Conference Future of Pragmatic Research: Building Multidisciplinary Teams for Innovation and Impact



Emerging Topics In Digital Health & Clinical Informatics

2024-2025 Seminar Series



Presented by:
Clint Carlson, MS

Social-Emotional, AI-Powered Avatar Simulations: Improving Communication & Building Empathy for all!



Social-Emotional, AI-Powered Avatar Simulations: Improving Communication & Building Empathy for All!

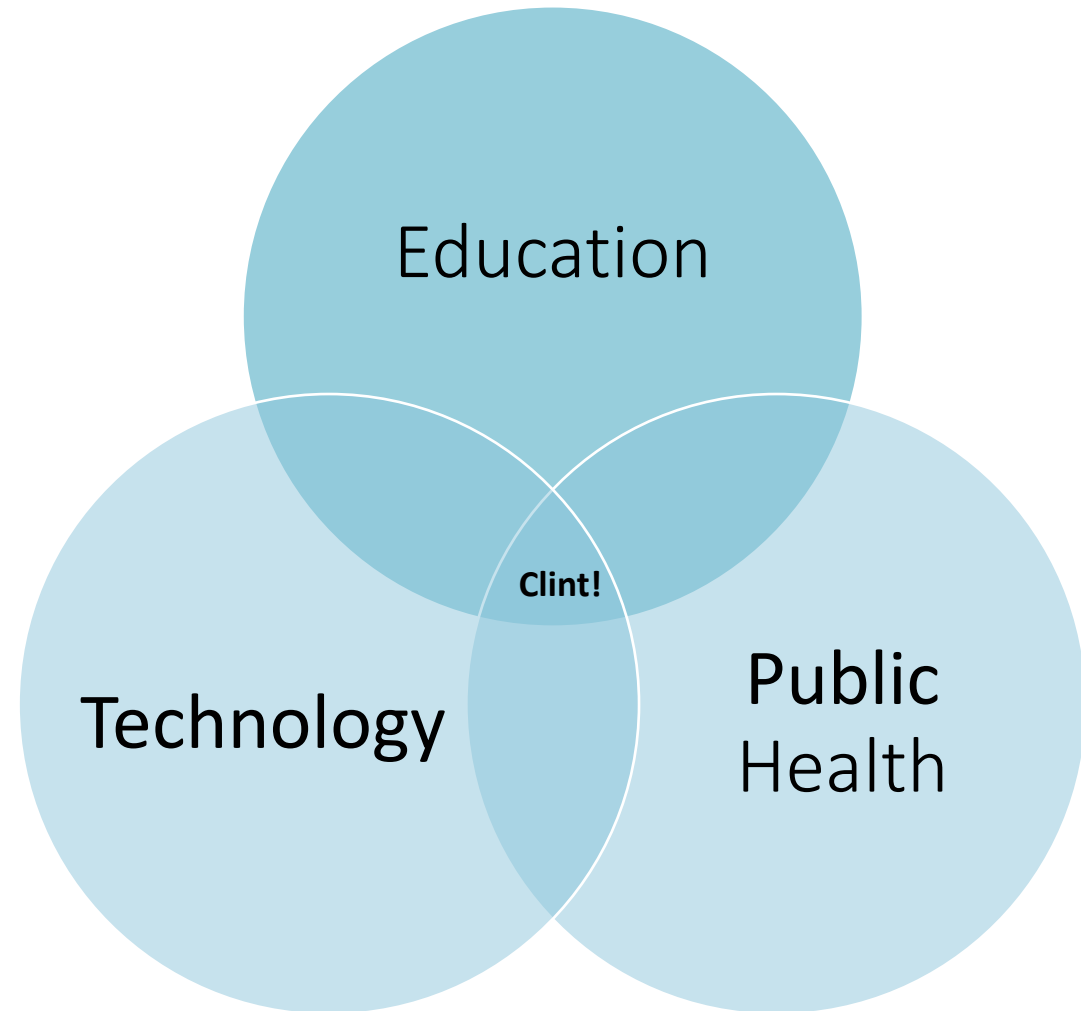
Clint Carlson - Director of Education Technology Innovations
@ Department of Psychiatry – Clint.Carlson@cuanschutz.edu



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Clint Carlson

- Background in Public Health (WHO), Education, & Technology
 - Human Interaction with simulation technology, 3D Modeling, and international education capacity building.
- Passionate about technology that builds capacity and provides purpose for life-long learning and public health.



Avatar-Based Social-Emotional Simulations

- Addressing the needs to improve soft-skills and improvising in Public Health conversations.
- The platform is highly customizable, allowing for complex scenarios tailored to specific needs and dynamic needs of diverse audiences.
 - Students, Faculty, Trainees, Social Workers, Parents/Guardians, Counselors, First Responders, Patients, Peers, Authority, Communities...
 - You get the idea... avatars are for everyone!



Hi there! My name is Karen. I am an avatar designed to introduce you to the Emotional Avatars being created at the University of Colorado - Anschutz Medical Campus.

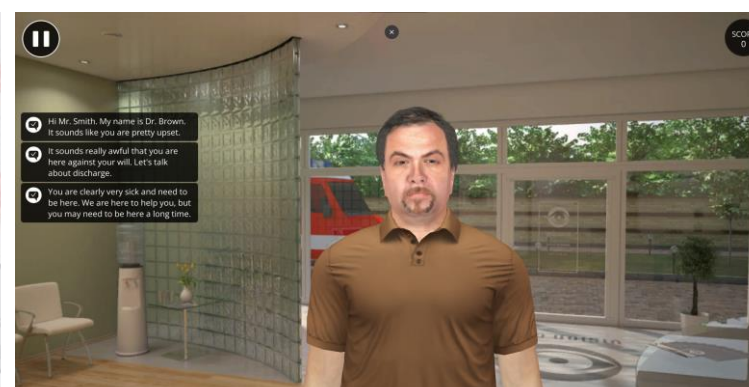
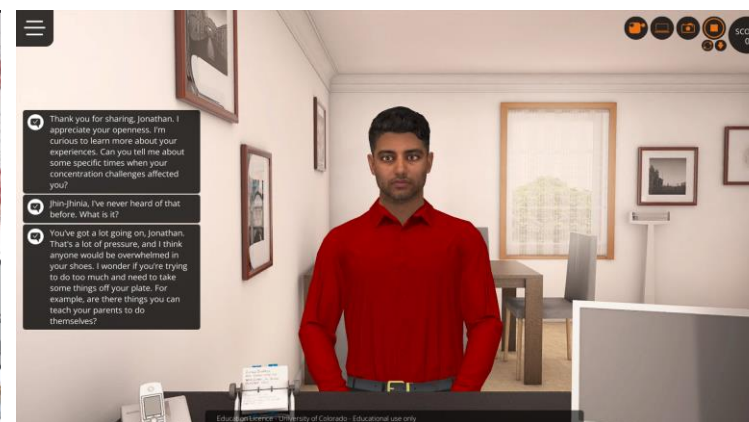
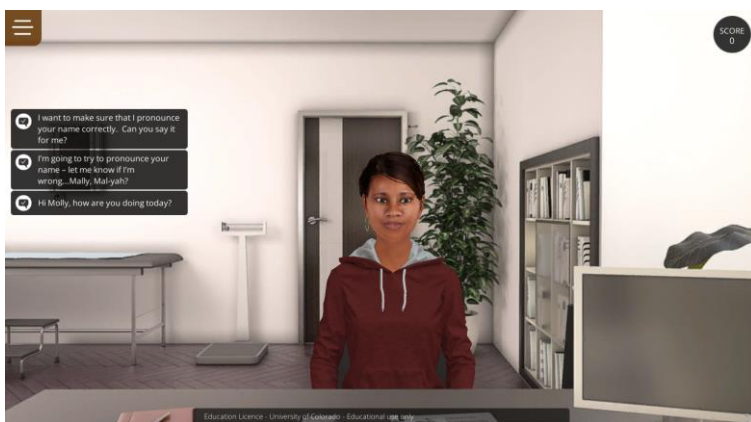
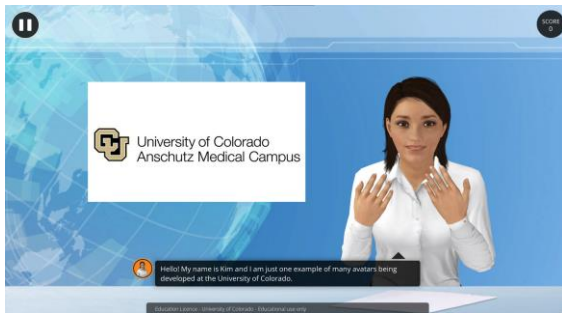


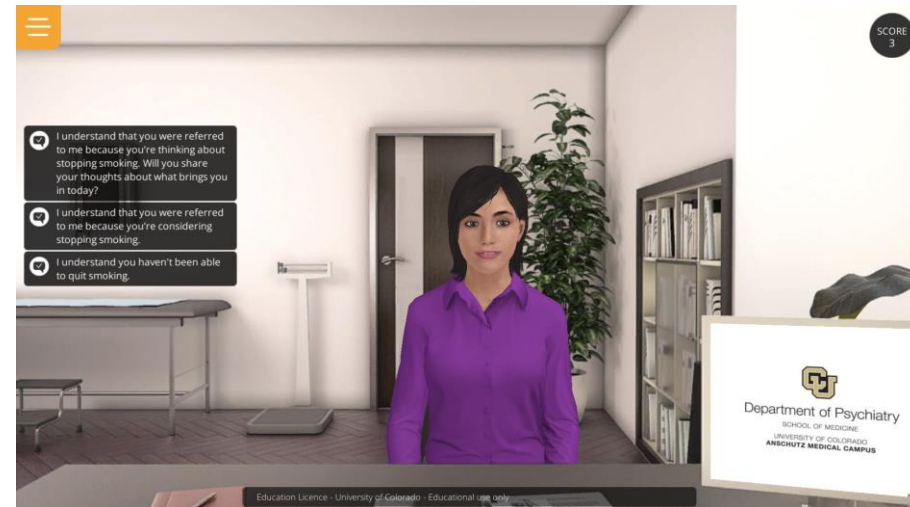
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A Safe Space for Experiential Learning

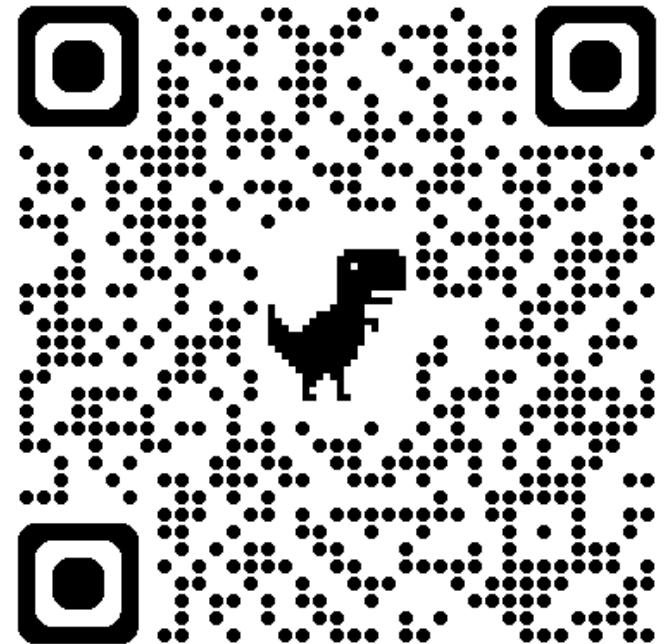
- Enables learners to explore a wide range of non-verbal emotional responses understand the corresponding changes in vocal tone associated with each emotion.
- Reactive verbal and non-verbal communication at each step in the conversation
 - What is said
 - How it is said (tone of voice)
 - Facial Expressions and Body Postures







Avatar Portfolio @ xr.cuanschutz.edu



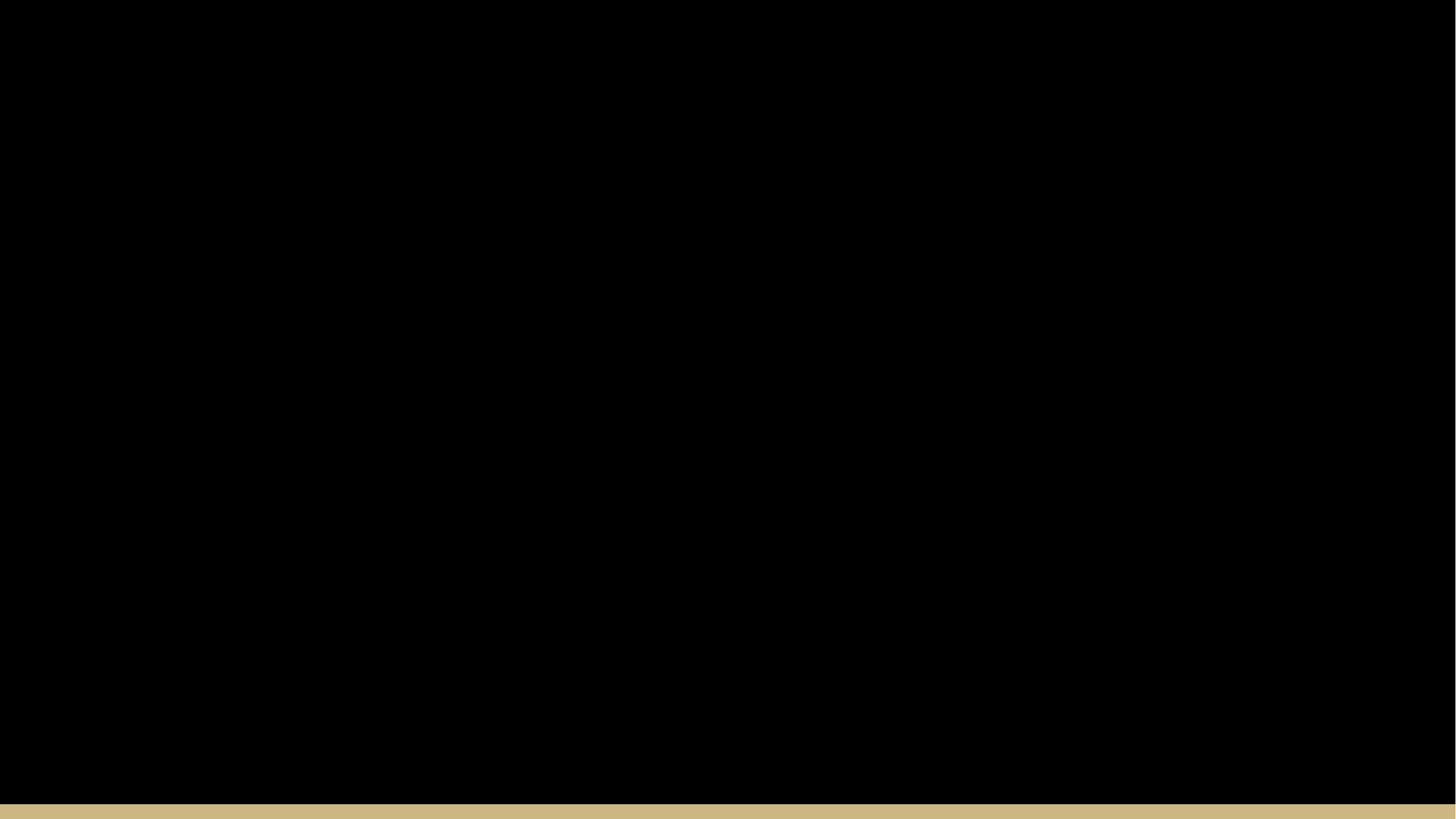
Examples

Motivational Interviewing w/Behavioral
Health & Wellness Program

<https://xr.cuanschutz.edu/mi/engaging/>



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Examples

De-escalation Techniques
w/Behavioral Health Services,
Denver Health

- <https://xr.cuanschutz.edu/deescalation/>



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Examples

Translation Dynamic

<https://xr.cuanschutz.edu/echo/>



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Examples

Veteran Health

Foundational Concepts: Integrating Healthcare and Military Culture

Assessment and Treatment Considerations for Veterans

Service Impacts on Military Families

<https://xr.cuanschutz.edu/bha-lms/vetfam/>



Examples

Preparing High School Students for Advocacy Conversations (School Violence)

- 4 pathways of conversation
- Awareness and confidence going into conversations
- Practice to experience how these conversations go
- <https://xr.cuanschutz.edu/bbicen/student-advocacy/school-violence/>



Where we are...

Where we are going...



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Avatars & A.I.

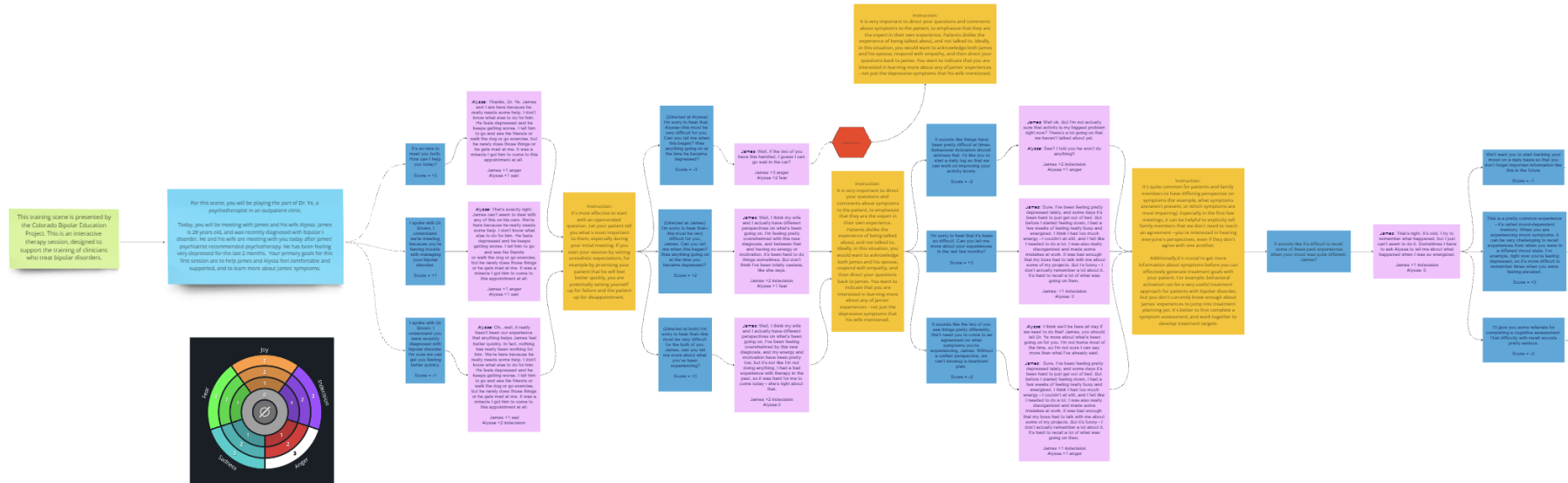
- **LLMs as the "Mind and Personality" behind avatars**
 - Isolating our own LLMs, we can engineer and design AI personas to respond authentically and change over time.
 - Already this being used the manual way by instructing LLMs to generate dynamic branching scripts.



Avatars & A.I.

Current Logic Workflows

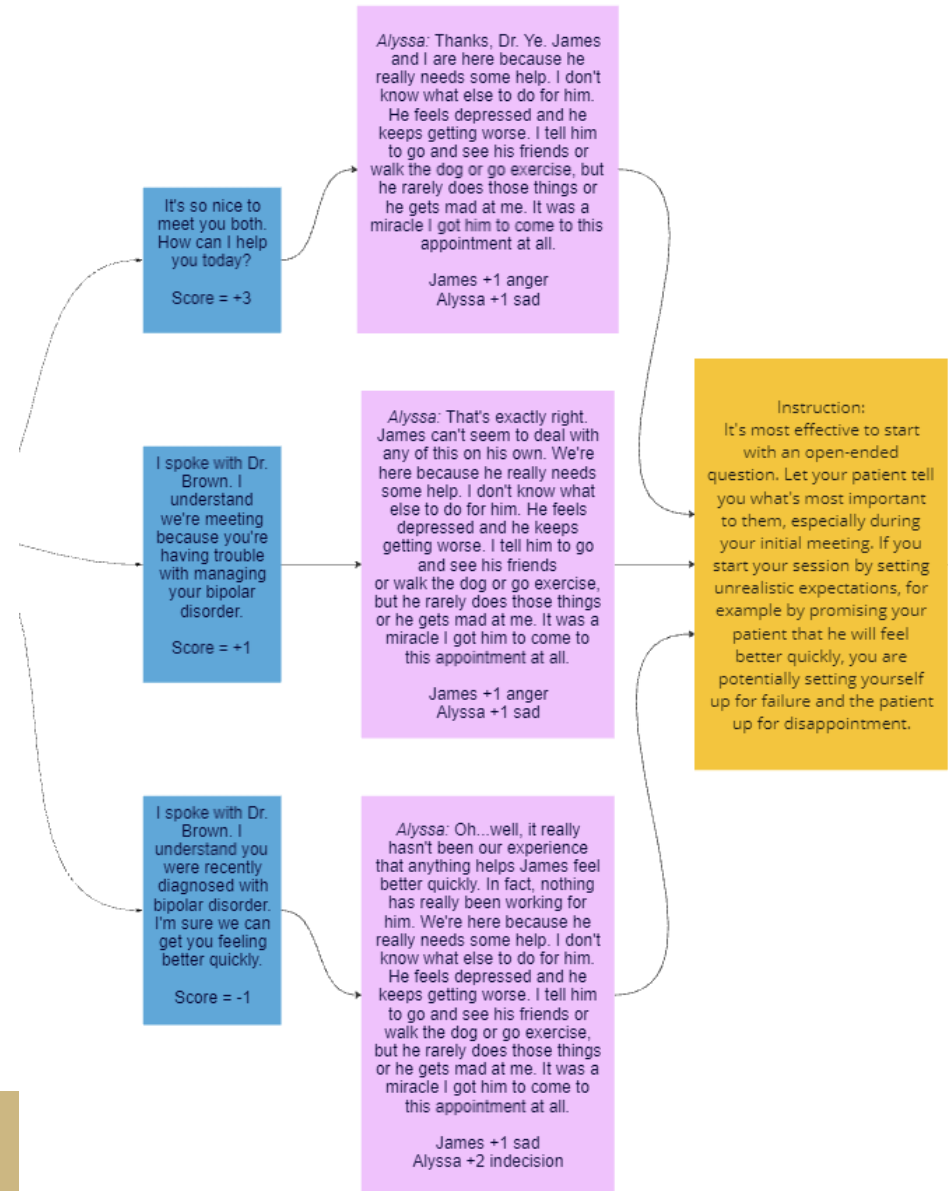
Basic...



Avatars & A.I.

Current Logic Workflows

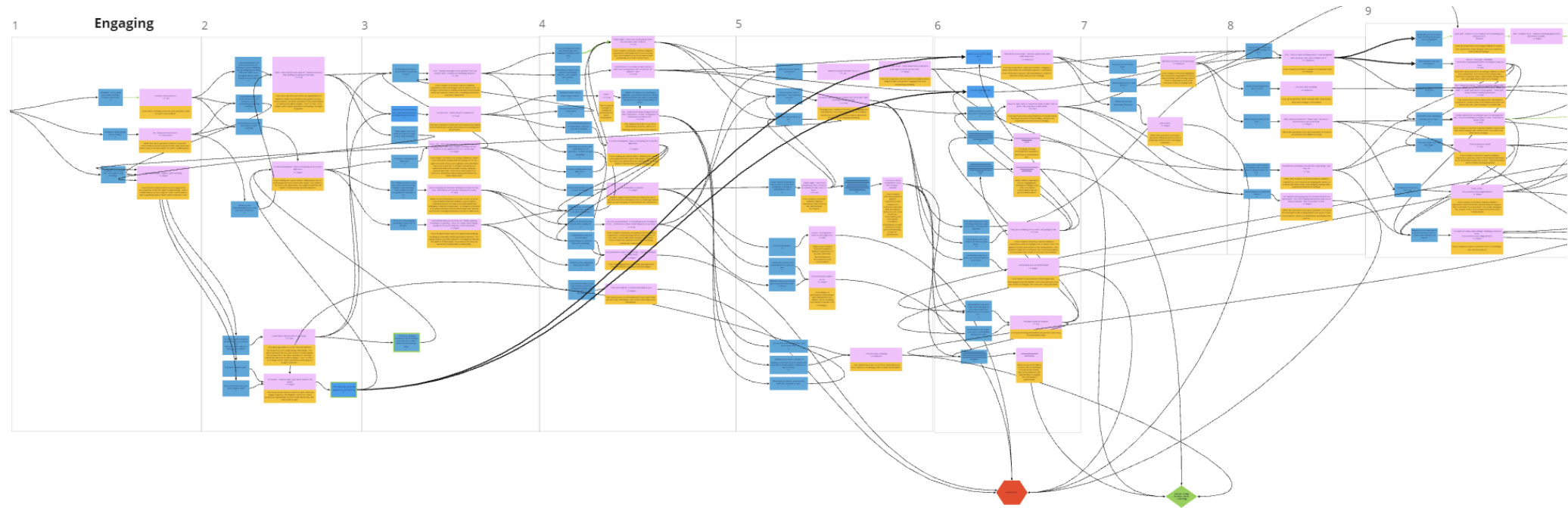
Basic...



Avatars & A.I.

Current Logic Workflows

Complex!



Avatars & A.I.

We are already using LLMs to develop the branching script by explain the project and feeding family/medical history into the LLM prompt!

Generate 3 different branching scenario conversations about a Cuban woman named Christina who is approaching menopause. Christina is 45 years old and primarily speaks Spanish. One scenario should be joyful, another upsetting, and a 3rd somewhere in between. Each scenario should have 3 responses of dialog and are aimed at a medical audience.

Sure, here are three branching scenario conversations about a Cuban woman named Christina who is approaching menopause. Each scenario has three responses of dialog and are aimed at a medical audience.

Joyful scenario

- **Doctor:** Christina, I understand that you are approaching menopause. How can I help you today?
- **Christina:** Doctor, I am feeling very well. I have been experiencing some hot flashes and night sweats, but they are not too bothersome. I am mostly concerned about the long-term health risks of menopause, such as osteoporosis and heart disease.
- **Doctor:** I am glad to hear that you are feeling well overall. Menopause is a natural part of life, and most women experience some mild symptoms. However, it is important to be aware of the potential long-term health risks. There are a number of things you can do to reduce your risk of these health problems, such as exercising regularly, eating a healthy diet, and getting enough calcium and vitamin D.
- **Christina:** Thank you for your advice, doctor. I will make sure to do all of those things.
- **Doctor:** Christina, I understand that you are feeling well overall, but you are concerned about the long-term health risks of menopause. I would like to discuss some of the things you can do to reduce your risk of these health problems.
- **Christina:** I would be happy to hear more about that.
- **Doctor:** There are a number of things you can do to reduce your risk of osteoporosis, such as exercising regularly, eating a healthy diet, and getting enough calcium and vitamin D. You can also talk to your doctor about taking hormone therapy or bisphosphonates.
- **Christina:** I will make sure to do all of those things.
- **Doctor:** There are also a number of things you can do to reduce your risk of heart



Avatars & Circumstances

- **Enhanced Simulation of Reality**
 - Patients change as circumstances in their lives change
 - Current weather
 - Day/time of the week
 - Upcoming holidays
 - Tax Season
 - Car broken down
 - Oldest child into University
 - Anniversary of traumatic events
 - Conflict between avatars



Avatars & Time/Aging

- **Enhanced Simulation of Reality**
 - Conversation and treatment at 14yo, 16, 19, 22, 35, 55, 70...
 - how does treatment and conversation change over the lifespan?
 - Conversation recall
 - Recall past conversations and even wrongly remember the conversation or context (just like humans!)



Avatars & A.I.

- **Voice to Text & Text to Voice**
 - Allowing us to move from "multiple choice" & "choose your own adventure" models toward speaking naturally.
 - Voice converted to speech for content response
 - Current context
 - Past conversations
 - Vocal analysis for emotion physical reaction
 - Context to understand what physical priorities to apply to the avatars (joy, sad, confusion...)
 - Combined for emotional voices speaking in textual context but also with appropriate emotion.



Avatars & A.I.

- **A.I. to Voice Analysis & Realism**
 - Voice converted to speech for content response
 - Current context
 - Past conversations
 - Vocal analysis for emotion reception to respond to.
 - Verbal and non-verbal cues.



We're sharing an update on the advanced Voice Mode we demoed during our Spring Update, which we remain very excited about:

We had planned to start rolling this out in alpha to a small group of ChatGPT Plus users in late June, but need one more month to reach our bar to launch. For example, we're improving the model's ability to detect and refuse certain content. We're also working on improving the user experience and preparing our infrastructure to scale to millions while maintaining real-time responses.

As part of our iterative deployment strategy, we'll start the alpha with a small group of users to gather feedback and expand based on what we learn. We are planning for all Plus users to have access in the fall. Exact timelines depend on meeting our high safety and reliability bar. We are also working on rolling out the new video and screen sharing capabilities we demoed separately, and will keep you posted on that timeline.

ChatGPT's advanced Voice Mode can understand and respond with emotions and non-verbal cues, moving us closer to real-time, natural conversations with AI. Our mission is to bring these new experiences to you thoughtfully.

2:35 PM · Jun 25, 2024 · 11.5K Views



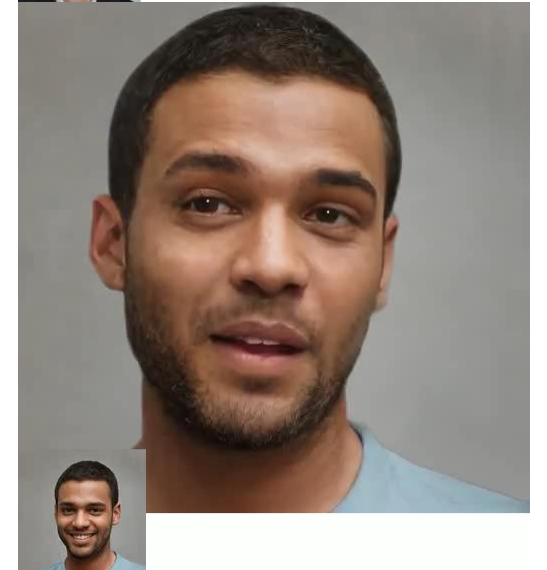
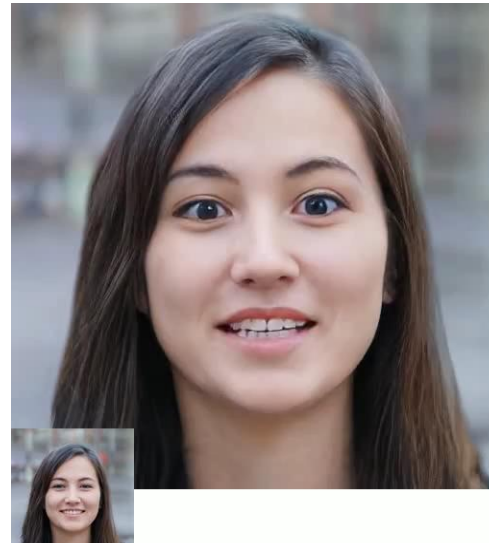
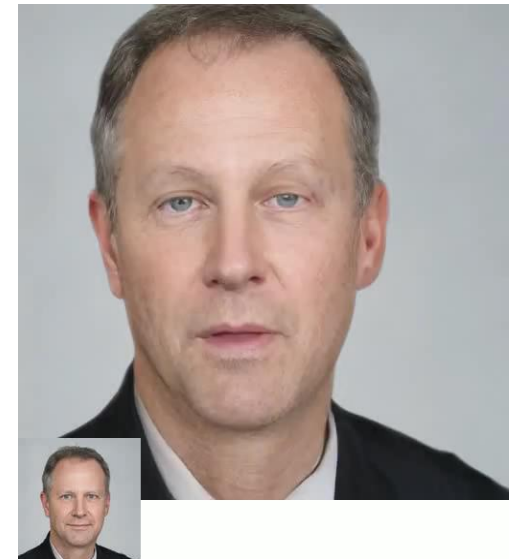
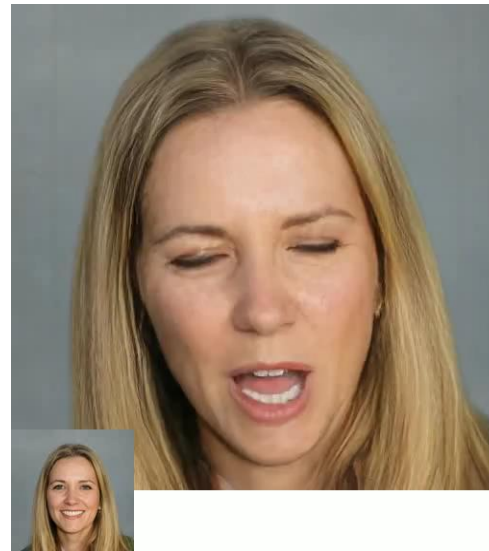
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Avatars & A.I.

- **Full Avatar Visual Realism**

- Away from the "video game" looking resolution currently, simulations can now be created with very high realism.

- <https://shunsukesaito.github.io/rgca/>
- <https://www.synthesia.io/>
- <https://www.microsoft.com/en-us/research/project/vasa-1/>
- <https://github.com/OpenTalker/SadTalker>





Wayne



Sofia in office



Sofia outdoor



Sofia



Raj outdoor



Raj in office



Vicky outdoor



Vicky



Angelina outdoor



Angelina in office



Aiden



Aiden outdoor



Let's see this in action!

- AI Generated Video
 - Trained on live people or generated
- AI Generated Content
 - Source Materials
 - Prompting around tone and subjects
 - Purpose of Conversation
- Voices
 - Trained on live voices or generated
- **ALL HAPPENING TOGETHER IN REAL TIME!**



Avatars & A.I.

- **Real-World Locations**
 - Avatars may be placed anywhere (GPS in the code) on earth!
 - Allowing for additional realism of timing and the unexpected while placing these simulations in real-world settings.
 - The world will soon be full of avatars sitting in physical spaces ready to interact.



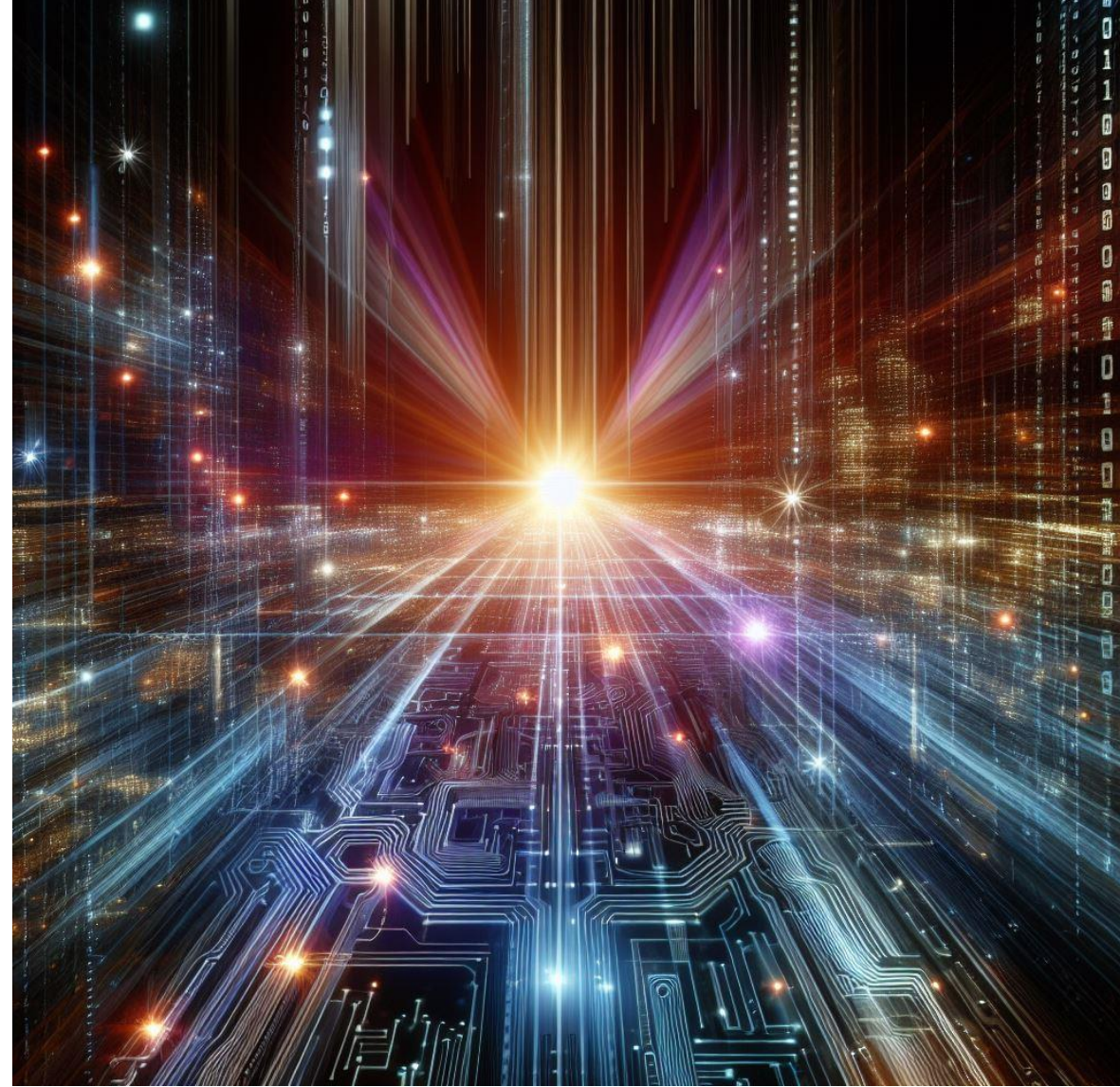
Avatars & A.I.

- **Augmented Reality & Spatial Computing**
 - Wearing a pair of AR hardware, avatars will be in physical spaces with all of us – waiting for learners to enter a room or entering the existing room.
 - Already using AR for Brain models - <https://xr.cuanschutz.edu/ar-brain/>



Avatars & A.I.

- **What an amazing time to be in EdTech!**
 - Addresses the "scale" problem of education.
 - Realistic experiential learning taking place in real-life physical locations.
 - Personalized towards individual learning preferences, pace, strengths, and weaknesses.
 - Adaptive Assessment in real time.
 - Access to Education for those experiencing barriers (location, cost, resources).
 - Lifelong Learning that offers personalized development and skill-building.





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THANK YOU!

Collaboration!?
Do you have a home for
these avatars?



Clint.Carlson@cuanschutz.edu

<https://www.linkedin.com/in/clintcarlson/>



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Social-Emotional, AI-Powered Avatar Simulations: Improving Communication & Building Empathy for All!

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@ Department of Psychiatry – Clint.Carlson@cuanschutz.edu