Conversational AI and Dialogue Systems - Natural language understanding, generation, and adaptive conversation.

Generative Models (for Realism) - Training AI to generate convincing behavior, visuals, or alternative outcomes.

Multi-Agent Systems and Social Simulation - Coordinated AI agents with distinct roles, perspectives, or strategies.

Adaptive Learning and Educational Agents - AI systems that adapt to user input to teach or provide feedback.

Procedural Narrative and Game AI - Story generation, branching worlds, and adaptive storytelling.

Overall Project Goal?:
To design, develop, and evaluate an interactive system that uses embodied AI agents (3D avatars powered by LLMs) to simulate multi-party conversations and translates the underlying social pragmatic signals (turn-taking, interruption, ignoring) into an intuitive real-time visual representation for analysis and insight.

Build an adaptive media system whose core contribution is a real-time, user-personalized representation & adaptation of social pragmatic signals produced during multi-party interactions (turn-taking, interruption, ignoring), realized via 3D AI avatars powered by LLMs. Use the job-interview scenario as an ecologically valid testbed

Emotions/trust in speech/body language (Regular conversation with single/multiple Models) (Speech prosody = melody of speech)

Emotionally Expressive Avatars through Speech and Facial Manipulation
Can multimodal AI avatars (speech prosody + facial animation) convey emotions in a way that users perceive as both natural and adaptive?
Train avatars to alter vocal tone, speed, pitch, and synchronize with facial micro-expressions.
Areas: affective computing with embodied conversational agents

Group AI idea (Werewolf etc.)

How can adaptive avatars make conversational processes such as turn-taking, interruptions, and ignoring more understandable in multi-agent dialogues?

Implement multiple avatars with distinct conversational strategies (e.g., cooperative, dominant, passive) and visualize their interaction patterns through adaptive gestures, gaze, and timing.

Research areas: group dialogue dynamics - embodied AI for social simulation.

The New Talking Stick
Simulate multi-party conversations and translates the underlying social pragmatic signals (turn-taking, interruption, ignoring)
Multi-agent avatars simulate a group with diverse, fixed opinions. The user's goal is to find common ground, and the avatars adapt their willingness to compromise based on the user's strategy (jury room maybe).

The dialogue canvas (visual metaphors)
A real-time 3D visualization tool where multiple AI agent avatars (e.g., a Devil's Advocate, an Optimist, a Skeptic) debate a user-provided topic. Their conversational flow is represented not just as chat bubbles, but dynamic. Turn-taking creates visual connections; interruptions are visualized as sharp, jagged lightning bolts that split the flow; and being ignored causes an avatar to slowly fade and drift to the background.

Job Interview Gauntlet (Reverse Persuasion)

Description:
Step into a world where each AI avatar represents a hiring manager. Your goal is to convince them to hire you, navigating their distinct personalities, priorities, and biases. Some avatars are strict and skeptical, others are friendly or overly dramatic. You must adapt your speech, gestures, posture, and environmental cues to each interviewer, balancing humor, professionalism, or empathy as needed. Each interview is unique, and failing to read a single avatar’s cues can jeopardize your success.

Beyond the gameplay, this experience lets players reflect on real-world persuasion and communication strategies, while the avatars’ adaptive behavior showcases AI-driven social simulation in an immersive, interactive setting.

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r panel member from a different profession — firefighter, police officer, doctor, teacher, engineer, or even creative roles.

Research Areas:

Conversational strategies in multi-agent dialogue: How different personalities affect negotiation and decision outcomes.

Adaptive embodied AI: Using gestures, posture, and gaze to convey cues that influence social decisions.

Social simulation of hiring processes: Modeling realistic decision-making in structured professional interactions.

Emergent group dynamics: Study how player actions interact with multiple AI agents’ personalities and priorities.

Trolley Problem:RE (Persuasion)

Description:
Classic trolley problems reimagined as multi-agent scenarios. Instead of a binary lever choice, users engage directly with AI avatars who are the actors in the dilemma: the worker on the tracks, the bystander, the loved one, the utilitarian philosopher. Each avatar pleads their case with its own logic, emotions, and strategies, creating dynamic persuasion and dialogue rather than static moral puzzles. The dilemmas evolve as players grow the sequence, stacking new moral complexities.

Research Area Overview:

Moral reasoning in groups → how agents embody ethical standpoints in real-time persuasion.

Turn-taking and interruptions → avatars compete to be heard in morally loaded scenarios.

Simulation of evolving dilemmas → dynamic adaptation beyond binary choices, modeling shifting values.

Historical Sandbox: The Circle (Critical Thinking)

Description:
Historical figures from different eras are thrown together into a shared “sandbox.” Imagine Napoleon, Cleopatra, Tesla, and Mandela in one room. The user doesn’t control them — instead, the fun (and research) comes from observing how these avatars interact based on distinct personalities, values, and worldviews. Will alliances form? Will conflicts erupt? Users can poke and prod, introducing events or objects, and watch as agents adapt. Both entertaining and deeply educational.

Research Area Overview:

Multi-agent cultural simulation → explores how differing historical mindsets and norms collide.

Embodied group dialogue → avatars show dominance, cooperation, or dismissal through speech, gaze, and gesture.

Narrative emergence in MAS → studies how unscripted storylines arise from interactions of distinct agent profiles.

Dilemma game

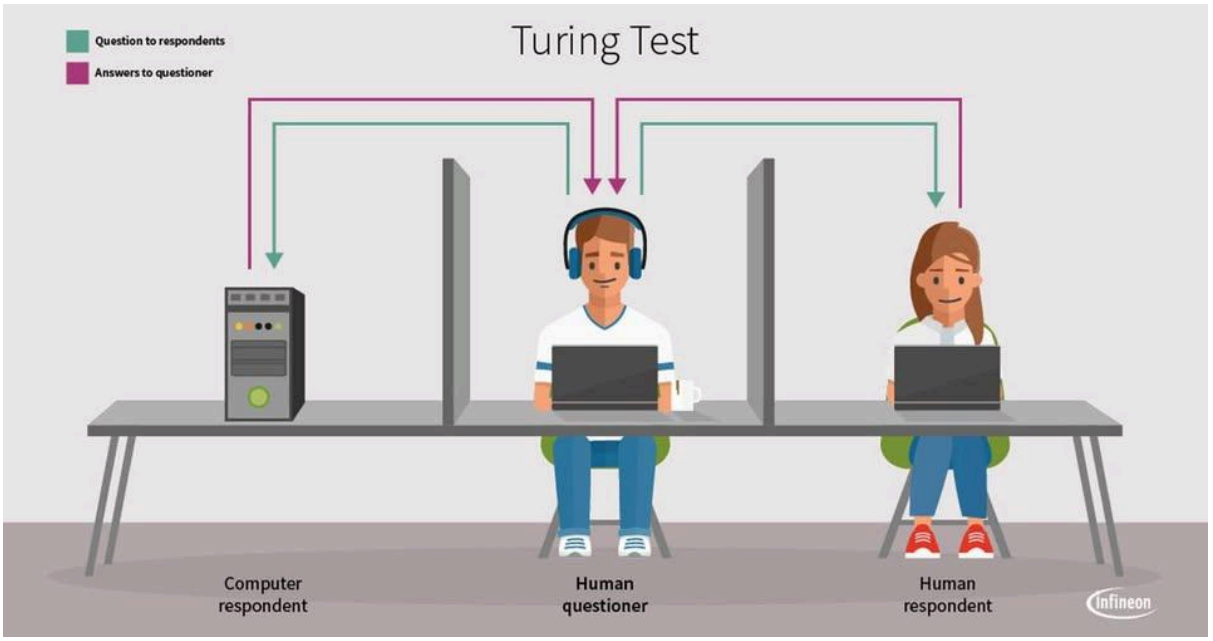
A project that challenges the user's thinking by reimagining traditional thought experiments. Unlike conventional setups, the individuals placed within the dilemma act as affective agents: they voice thoughts, display characterization, and respond as the user makes sequential choices within a Trolley Problem-like framework.

AI Avatar vs. Turing (+1 Mubarik)

1. Can an avatar, with realistic gestures and speech powered through AI, be able to convincingly simulate a human interaction to the point where a participant cannot reliably distinguish from being a human or AI.

The goal of this project is to explore if it is possible with the assistance of an AI-driven avatar, with the possibility of gestures and speech, to aim at natural conversational abilities. That should be able to simulate a human-to-human interaction. Therefore, an avatar will be created and modeled to mimic human gestures and talk to see if the Turing test can be passed.

Test procedure:
program will be created with two different versions of the Avatar one driven by AI, with the access to text to speech, and adding different gestures while speaking to the test participant. There will also be created a human controlled version, with the same options, the test participant will not know which version they're a talking to and will have to take a guess afterward.



Persuasion Engine

(talking stick)
The avatar must argue a point (e.g., “You should recycle more”). The system uses real-time analysis (speech-to-text for user counter-arguments, vocal tone analysis for confidence, or even a simple “thumbs up/down” input) to gauge the user's stance.
Extensions
To use multi-agent avatars as a medium for perspective-taking. The system allows a user to “step into the shoes” of another person in a conflict or dialogue

Multi-agent avatars simulate a group with diverse, fixed opinions. The user's goal is to find common ground, and the avatars adapt their willingness to compromise based on the user's strategy.

Creative Catalyst

Core Idea: A multi-agent system where each AI avatar embodies a different creative thinking style (e.g., the Artist, the Engineer, the Critic) to collaboratively brainstorm and adapt to a user's ideas.

GAN for behavior +1(Mubarik)

Core Idea: Pitting two ML models against each other: one trying to generate the most perfectly realistic avatar (the generator), and another trying to spot the slightest flaw in its behavior (the discriminator). This Generative Adversarial Network (GAN) setup is trained to improve avatar realism automatically.

Idea drafts

- multi-agent social game (werewolf etc.) (+1Mubarik 😮)
    - https://www.yetanotherfreedman.com/resources/challenge_pwag.html
- Presentation Simulator
- Socratic questioners
- Personality fingerprint copying

Future Generation

Converse with an AI avatar representing your future self or even future generations affected by your current actions. The avatar draws on data about your present choices, habits, and personality to simulate how your life or legacy could unfold decades ahead. Conversations explore moral decisions, life priorities, and hypothetical consequences, giving you a reflective, introspective experience. The avatar adapts over time, referencing past sessions and adjusting its advice, warnings, or predictions based on your evolving behavior.

Martian

A newborn alien or Martian avatar is introduced to your world with no knowledge of language, gestures, or human norms. Your task is to teach it communication: words, speech patterns, gestures, and social cues. The AI learns incrementally, adapting to your teaching style, and its personality emerges based on your guidance. The challenge lies in patience, observation, and experimenting with teaching strategies, creating a dynamic, emergent learning experience that blends education, play, and emotional investment.

Debate Corrector

In any debate, argument, or discussion scenario, this AI avatar actively monitors statements, facts, and logical reasoning. When someone presents inaccurate or misleading information, the avatar intervenes in real time, correcting errors politely or humorously, depending on the settings. The AI adapts to your debate style, learning how assertive or persuasive you are, and even offers subtle coaching cues, making it both a learning tool and a social gameplay element.

Historical Figures

Engage in conversation with iconic historical avatars, from scientists and political leaders to artists and explorers. These AI avatars adapt to your questions, providing insights into their thought processes, decision-making context, and personality quirks. Conversations can reveal hidden perspectives, challenge modern assumptions, or spark debates about ethics, strategy, and culture. Adaptive gestures, expressions, and speech make these encounters feel immersive and human-like, offering a deeper understanding of history through conversation.

Alternate Decision AI

What if you made a different choice in a pivotal moment? This AI avatar lets you explore the “paths not taken.” By feeding in information about your real decisions, the avatar simulates alternative scenarios, narrates consequences, and adapts to your reactions. The experience blends reflection, self-analysis, and moral exploration, offering insights into personal growth and the ripple effects of choices. Over time, it can even reference patterns in your decision-making, creating a rich, evolving interactive diary of “what could have been.”

AI Dungeon Master

Immerse yourself in a role-playing adventure guided entirely by an AI avatar. You begin by selecting your class, race, and starting parameters, then the AI narrates and directs the journey, responding dynamically to your choices, dice rolls, and strategy. Gestures, facial expressions, and adaptive speech make the experience feel like a live tabletop session, where storytelling, improvisation, and risk-taking blend seamlessly. Each playthrough is unique, encouraging creativity, problem-solving, and engagement.

AI Avatar + Idle Game

Take a traditional idle/clicker game and inject a living, reactive AI avatar. While the core gameplay progresses automatically, the avatar reacts to your progress, gives guidance, provides humor, and occasionally presents interactive mini-challenges. The avatar can adapt to your strategy, offering praise, subtle hints, or challenges to keep you engaged. This combination blends the addictive progression of idle games with the adaptive, immersive presence of AI avatars.

Interacting AI Avatars

Observe or moderate interactions between AI avatars. No theme per se, but could be avatars with vastly different historical or cultural backgrounds — for example, a British soldier, a Mongolian warrior, and a Japanese ninja. Each avatar embodies distinct communication styles, social norms, and perspectives, reacting dynamically to others’ behavior. The scenario explores cultural and temporal differences, negotiation, conflict resolution, and emergent storytelling. You can experiment with guiding, observing, or influencing interactions, creating endless social and narrative complexity.