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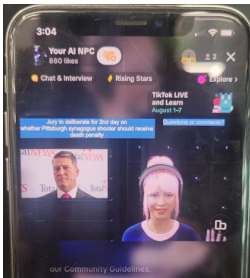
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Google Scholar: <https://scholar.google.com/citations?user=3plYmtsAAAAJ>

Highlighted Projects and Portfolio



Flawless AI (2024-2026)

Language localization/mouth replacement for cinematic video. Face perception, motion tracking, 3D tracking, lip sync, lip sync refinement tool building.

TikTok Avatars (2022-2023)

Lip sync and head movements for 3D real time avatars on TikTok.

Real time avatars for TikTok LIVE (2023)

Real time interactive 3D avatars for TikTok LIVE including lip sync, gesturing. News anchors, virtual DJs, NPCs.

**Robotic gesturing and facial movements in realtime chat from text (2020)**

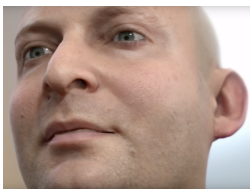
Trigger arm gestures based on conversational context for a limited DOF robot. System would markup chat conversation with desired gestural indicators to accompany voice. (Embodiment Digital)

**Automated robot gesturing from text (2019)**

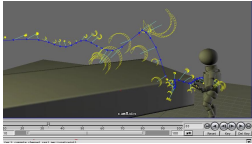
Automatic arm gestures for humanoid robot, Sophia. System accepts text input and outputs motor signal for animating robot arms based on models of human gesturing. (Embodiment Digital)

**Avatar communication for MND users (2020-2021)**

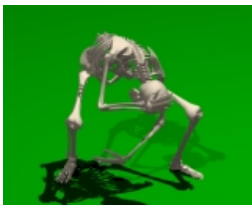
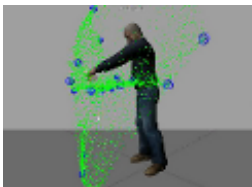
Real time avatar system driven by gaze-based software for motor neuron disease (MND) sufferers (Dr. Peter Scott Morgan, similar to Stephen Hawking.) Allows user to communicate through avatar by selecting text and emotion. (Embodiment Digital)

**Digital Ira (2013)**

Actor and face of Digital Ira project (USC ICT / Activision / Nvidia), first real time photorealistic, fully 3D model. Downloadable via Nvidia FaceWorks.



Virtual Human and Avatar Software



Bot Battle (2020)

A live, streaming back and forth chatbot ‘battle’ between Pandorabots’ Mitsuku and Facebook’s recent open source BlenderBot chatbot. Battle ran for over a month, 24 hrs/day from Oct-Nov 2020.

Software for visual effects and video games

Software development for visual effects (ILM, Rhythm and Hues) and video games (LucasArts), including animation, rigging, skin, hair, fur, muscles, rigid bodies, visualization tools for creatures and characters.

SmartBody

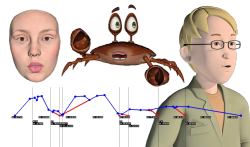
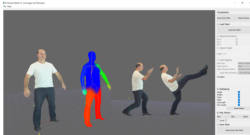
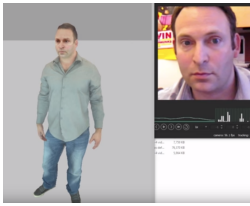
Real-time character animation platform, including locomotion, grasping, lip syncing, gesturing, gazing, head movements, steering, IK, online retargeting. <http://smartbody.ict.usc.edu>

Dynamic Animation and Control Environment (DANCE)

Physics-based character animation platform. Dynamics controller authoring environment, including real time dynamics control, ragdoll functionality. <http://www.arishapiro.com/dance/>

Automatic gesturing from text/speech

Automatically generates animation based on text or speech input. Generates body gestures, head movements, eye movements and facial expressions based on modeling of human communication. <https://youtu.be/sD7Q777wIaQ>



Rapid Avatar

Pipeline for generating a rigged, 3D human model with face blendshapes, rigged body and hands, online retargeting of motion. <https://youtu.be/bVW9pEIV3is>

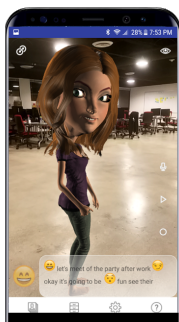
Autorigger and Reshaper

Automatic rigging tool for 3D scans from photogrammetry cages and RGB-D sources. <https://youtu.be/e1kCK3DKrNA>

Lip syncing to speech

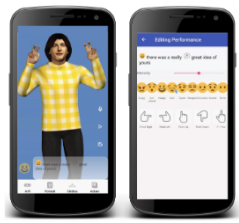
Visual speech / lip syncing that allows natural interface for customization.

Virtual Human and Avatar Mobile Apps



A/R Avatar Director

Choose an avatar, record your voice and emotion, avatar animates automatically. Place the avatar in augmented reality and create videos for sharing on social media. (Embodiment Digital) Apple App Store



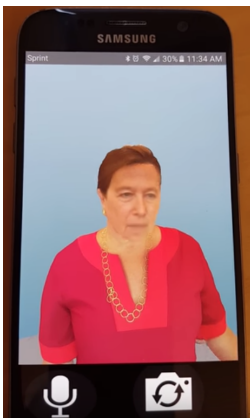
UBeBot

Create an avatar from a selfie or photo. Dress up the avatar with hair and clothing. Record your voice to automatically animate the avatar, put into augmented reality. (Embodiment Digital) Google Play Store.



AI Expert

Build an AI-driven talking avatar using a spreadsheet and classification AI. Spreadsheet is automatically converted into real time AI. Ask a question, get an answer from the AI. Put into augmented reality. (Embodiment Digital) Google Play Store.



DocOn

Interactive digital doctor that answers questions about medical conditions. Doctor is 3D scanned, photorealistic textures, and her own voice used to improve patient rapport.

Avatar and Virtual Human Studies



Study of detecting behavioral signatures within DeepFake videos (2022)

Is there an identifiable behavioral signal that can be used to detect deepfake videos?



Speech breathing in virtual humans: An interactive model and empirical study (2019)

Does the presence of speech breathing affect the user's perception of a speaking virtual human?



Acting the part: The role of gesture on avatar identity (2014)

How much does gestural style affect the perception of a user when viewing an avatar that looks and sounds like a familiar person?



Addressing Sexist Attitudes on a College Campus through Virtual Role-Play with Digital Doppelgangers (2018)

Can sexist attitudes be affected when using one's own avatar in a simulation?



Study comparing video-based characters and 3D-based characters on mobile devices for chat

How does interaction with a voice-only, animated or photorealistic virtual human/avatar affect user rapport?



Analyzing the effect of avatar self-similarity on men and women in a search and rescue game (2018)

How does playing a game with one's own avatar versus playing a game with one's friends' avatar affect performance? Is there a difference between men and women when playing as avatars?

The effect of operating a virtual doppleganger in a 3D simulation (2015)

Will playing a game as one's own avatar affect the performance in a game versus playing as a generic avatar?

Motion recognition of self and others on realistic 3D avatars (2017)

Can users identify their own motion on their own avatar? Can users identify familiar people's motions on their avatars?

Can a Signing Virtual Human Engage a Baby's Attention? (2019)

Can a deaf infants benefit from instruction from a virtual agent using sign language?

Media Coverage

- May 5th, 2020 **RT: The Future is Now** Virtual reality: Will it render the real world obsolete? <https://youtu.be/u8qjoMW3Oso?t=1244>
- August, 2019: **USC Engineering** Everywhere at Once <https://viterbischool.usc.edu/news/2019/08/everywhere-at-once/>
- December 2018: **Report, Italy**. Sanita 4.0 <https://www.rai.it/programmi/report/inchieste/Sanita-40-d7974afe-7939-4180-9af1-36d4e9e2410b.html>
- January 2018: **BBC Click**. Cheating Death in Silicon Valley <https://www.youtube.com/watch?v=8HwOrFzHePA&feature=youtu.be&t=509>
- December 2017: **Viterbi Magazine**. Superman and Wonder Woman Get Action Figures. Why Not Engineers? <http://magazine.viterbi.usc.edu/fall-2017/student-life/superman-and-wonder-woman-get-action-figures-why-not-engineers/>
- December 27, 2017: **Cheddar.com**. <https://cheddar.com/videos/becoming-an-avatar>
- November 21, 2017: **Redbull TV/Liquid Science**. Virtual Reality. <https://www.redbull.tv/video/AP-1N7M57XN12111/virtual-reality?playlist=AP-1N83MJWAH2111:season:1>
- August 9th, 2017: **FastCompany**. In the future, your doctor may be an avatar. <https://www.fastcodesign.com/90136085/in-the-future-your-doctor-may-be-an-avatar>
- May 10th, 2017: **UploadVR**. Avatar Technology From USC Captures Your Body In 20 Minutes. <https://uploadvr.com/usc-ict-real-avatar-20-minutes-shapiro/>
- February 26, 2017: **Reuters**. The virtual doctor will see you now. <https://www.reuters.com/video/2017/05/09/the-virtual-doctor-will-see-you-now?videoId=371645018>
- February 26, 2017: **CBS Sunday Morning**. Digital Doubles: Bringing actors back to life. <http://http://www.cbsnews.com/news/digital-doubles-bringing-actors-back-to-life/>
- August 8, 2016: **Pasadena Magazine**. The Virtual Doctor is In. <http://pasadenamag.com/the-virtual-doctor-is-in/>
- June 17, 2016: **OZY**. Now you too can live in a simulation. <http://www.ozy.com/fast-forward/now-you-too-can-live-in-a-simulation/67657>
- May 18, 2016: **CCTV America**. Rendering the digital self. <http://www.cctv-america.com/2016/05/18/rendering-the-digital-self>
- May 9, 2016: **Primemind**. How lifelike can your avatar get? <https://primemind.com/how-lifelike-can-your-avatar-get-f358cc87b869>
- February 3, 2016: **USC News**. The future of gaming: Create your own character in just four minutes. <http://news.usc.edu/91424/the-future-of-gaming-create-your-own-character-in-just-four-minutes/>
- July 22, 2014: **Voice of America**. Coverage of the Rapid Avatar project. <http://www.voanews.com/content/researchers-target-low-coast-avatar-technology/1963213.html>
- July 17, 2014: **fxguide.com** Interview on the Rapid Avatar project for SIGGRAPH Real Time Live <http://www.fxguide.com/fxpodcasts/fxpodcast-279-siggraph-preview-real-time-live/>
- April 28, 2014: **The New Yorker** Article about Paul Debevec and Digital Ira <http://www.newyorker.com/magazine/2014/04/28/pixel-perfect-2>
- April 10, 2014: **USC Viterbi**. Coverage of Rapid Avatar project. <http://www.viterbi.usc.edu/news/news/2014/game-avatar-3d-motion-capture.htm>
- February 11, 2014: **Gizmodo**. <http://gizmodo.com/this-dead-simple-rig-puts-you-in-a-video-game-with-gear-1520325904>
- December, 2003: **Digital Media World**. Interview about character physics work.

Awards and Honors

- 2025: Pragnesh Jay Modi Best Student Paper Award, **AAMAS 2025**, Large Language Models for Virtual Human Gesture Selection, June 2025.
- 2019: Finalist, **National Association of Broadcasters, PILOT Challenge**, Interactive, AI-Driven newscaster on mobile, December 2019. (Embody Digital)
- 2018: Best Technology: **Visual 1st**, Embody Digital, San Francisco, CA, October 2018.
- 2016: Best Presentation: **ACM SIGGRAPH Conference on Motion in Games**, The effect of operating a virtual doppelganger in a 3D simulation.
- 2015: Best Poster: **SIGGRAPH I3D**, Rapid Photorealistic Blendshapes From Commodity RGB-D Sensors.
- 2014: Honorable Mention, Best Research Demo: **IEEE VR**, Automatic acquisition and animation of a virtual avatar.
- 2012: Best Paper: **Motion in Games**. Automating the transfer of a generic set of behaviors onto a virtual character.

Invited Talks and Seminars

- December, 2019 **Keynote, CRDH: From Capture to Rendering of Digital Humans for AR/VR Workshop at IEEE AI VR Conference, San Diego, California.**
- November, 2019 '**AI: The Case for Virtual Humans**', Panelist, **Infinity Festival 2019, Los Angeles, California.**
- April, 2017: **Towards the Creation of a 'Digital You' for Immersive Environments, VRLA 2017, Los Angeles, California.**
- January, 2017: **Virtual Humans and Crowds in Immersive Environments (VHCIE) Workshop 2017, Marina Del Rey, California.**
- October, 2016: **USC Body Computing Conference 2016, Los Angeles, California.**
- July, 2016: **CGI 2016, Crete, Greece.** Keynote: "Rapid Creation of Digital Characters"
- May, 2015: **FMX 2015, Stuttgart, Germany.** "Towards Rapid Creation of Pervasive, Controllable 3D Characters"
- October, 2014: **West Point, Highland, New York.** "On building a 3D character"
- March, 2013: **DreamWorks Animation, Glendale, California.** "Practical Character Physics for Animators"
- February, 2010: **USC Institute for Creative Technologies.** "Motion Editing for Animated Characters"
- July, 2009: **UCLA, Los Angeles California.**
- February, 2009: **Academy of Art, San Francisco, California.** "An Evening with Rhythm and Hues"

Patents

2023 US20230377556A1

Voice generation for virtual characters

Realtime voice generation for virtual characters.

<https://patents.google.com/patent/US20230377556A1/en>

2021 US11195318B2

Rapid avatar capture and simulation using commodity depth sensors

using RGB-D sensors to create an avatar, automatically rigging the avatar, then attaching behaviors and movements to the avatar.

<https://patents.google.com/patent/US11195318B2/en>

Film Credits

Watch The Skies (English) 2025, Flawless

Alvin and the Chipmunks: The Squeakquel 2009, Rhythm & Hues Studios

The Incredible Hulk 2009, Rhythm & Hues Studios

Video Game Credits

Star Wars: The Force Unleashed - Ultimate Sith Edition 2009, Lucas Arts, Windows

Star Wars: The Force Unleashed 2008, Lucas Arts, Playstation 3 and XBox 360

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