



environ
MENTAL

Towards VR Interventions in environMENTAL

Master Class
19/3/2025

Mel Slater (UB)





Outline

- ❖ Current state of immersive systems
- ❖ Talking to yourself
- ❖ Shared virtual environments
- ❖ Augmented Reality
- ❖ Ways ahead for environMENTAL





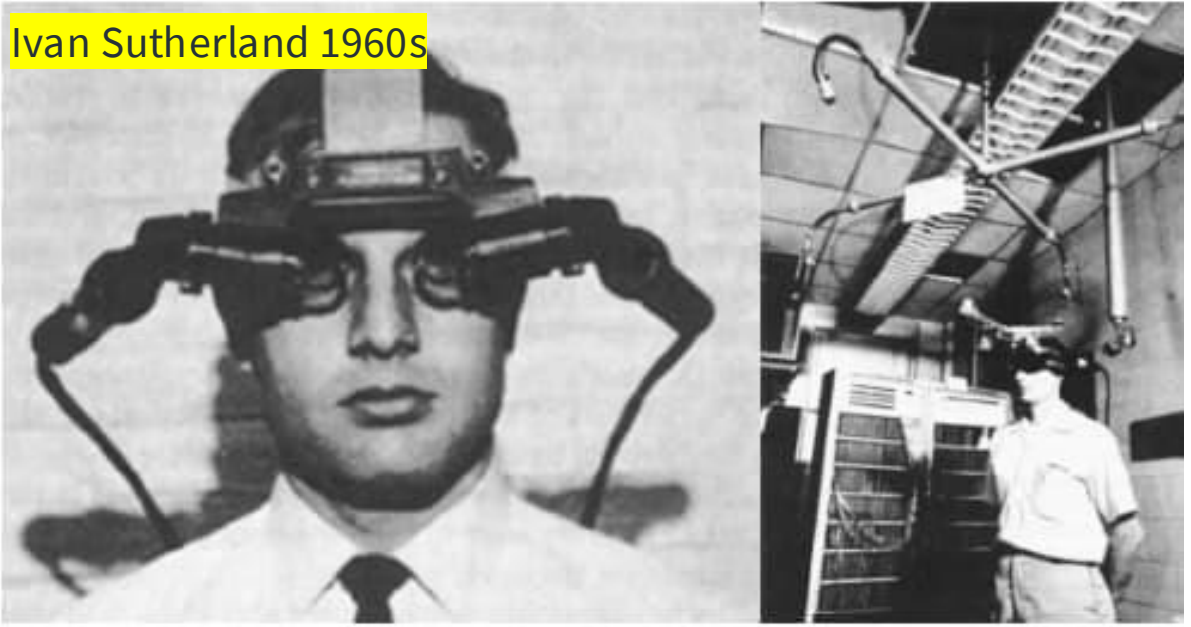
Virtual Reality started like this



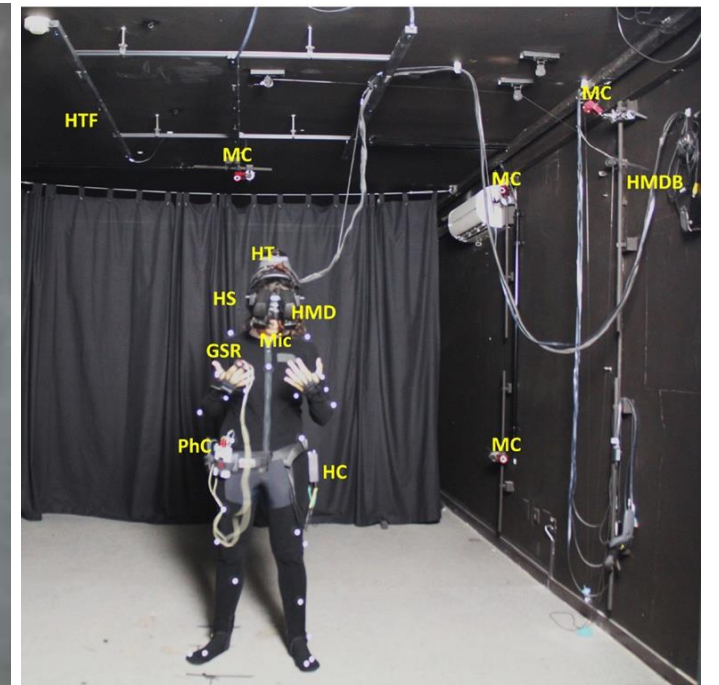
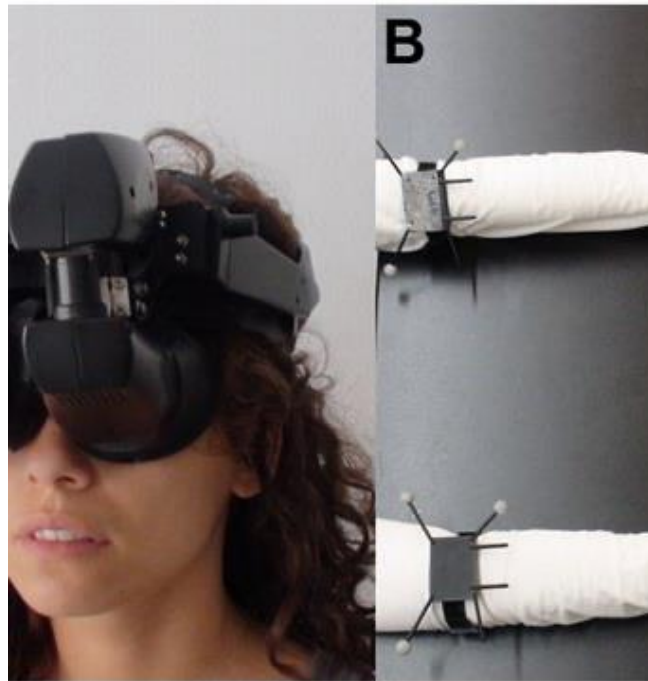
Ivan Sutherland
The Ultimate Display
1965







Needed very powerful and expensive computer to drive the displays



Now it is like this



Just around 8 years ago our lab setup
cost around 50K€

Now even better costs around
400€



Standalone

- Although programs are developed on a PC
 - they can run on the HMD itself without any connection to a PC.
- They are therefore highly portable
 - A consumer product





Mixed Reality



Augmented Reality





Apple Vision Pro

- The most superb device I have experienced
- Mixed Reality ('spatial computing')
- Extremely high resolution
- Can switch between complete immersion or complete see through
- Integrated with Apple products
- Expensive





Intervention in environ**MENTAL**

- ❖ In the proposal
 - ❖ Conversations with yourself (ConVRSelf)
- ❖ New idea (from Gunter)
 - ❖ Group intervention ('focus group') ('group therapy')





Meeting Yourself

- ❖ “People often reason more wisely about other people’s social problems than about their own.”
 - ❖ Exploring Solomon’s Paradox: Self-Distancing Eliminates the Self-Other Asymmetry in Wise Reasoning About Close Relationships in Younger and Older Adults, Igor Grossmann, Ethan Kross, Psychological Science (2014)





CONVRSELF™

Self-counselling through
immersive virtual reality

ConVRSelf



- ❖ Conversations with yourself in virtual reality
- ❖ You become the friend
- ❖ You have a conversation with your look-alike self





VIEW SIZE

LISTEN



Using ConVRSelf to Foster Physical Exercise

- ❖ Participants first watched a videos by Lebron James or Serena Williams promoting exercise
- ❖ Experimental Group: spoke with Lebron James or Serena Williams about how they could enhance their physical exercise routine.
- ❖ Control Group: only saw the video
- ❖ Results over the subsequent week:
 - ❖ Exercise in Experimental Group > Control Group
- ❖ Daniel Levy, Doron Friedman, Elena Álvarez de la Campa Crespo, Bernhard Spanlang, Mel Slater (2023, in review) Self-Conversation with a Sporting Celebrity Enhances Later Physical Exercise





Talking to yourself about Obesity



SOCRATES

- ❖ Obesity is a major world health problem
- ❖ 23% of women, 20% of men
- ❖ 69B€ per year cost in Europe
 - ❖ “The whole of Europe spends between 1.9% and 4.7% of the total annual health care costs and 2.8% of the annual hospital costs in dealing with overweight or obese patients.”
- ❖ Multiple adverse health effects
 - ❖ Diabetes, coronary arterial, mental health
- ❖ Current treatments have limited effectiveness
 - ❖ Initial success with patients eventually returning to prior weight





SOCRATES Focus and ConVRSelf

- ❖ Self awareness
 - ❖ When we look in a mirror we see what we expect to see.
 - ❖ We never see ourselves from the perspective of another.
 - ❖ Here patients see and interact with a 3D representation of themselves.
- ❖ Self-stigmatisation
 - ❖ Patients maintain a conversation with a representation of themselves while the body shape changes. Yet they are still always the same person.
Demonstrates we are not just a size and a shape.
- ❖ Self-determination
 - ❖ Patients talk with a fit and healthy of their future self who has learned how to overcome their condition, and maintain a healthy body size. They learn from their future self how this was accomplished.



ConVRSelf with Obesity

- ❖ Patients attend an intensive motivational interviewing course
- ❖ A look-alike virtual body representation is constructed
- ❖ They converse with themselves over a series of meetings
 - ❖ With a general counsellor
 - ❖ With a representation of a fit and healthy future self







Randomised Control Trial - Excellent Results

- ❖ D. Anastasiadou, M. Slater, B. Spanlang, D. C. Porras, M. Comas, A. Ciudin, G. P. Puig, J. Vázquez-De Sebastián, J. A. Ramos-Quiroga, P. Lusilla-Palacios (2022) [Clinical efficacy of a virtual reality tool for the treatment of obesity: study protocol of a randomised controlled trial.](#) BMJ open 12
- ❖ D. Anastasiadou, D., P. Herrero Castillo, J. Vázquez-De Sebastián, B. Spanlang, E. Álvarez De La Campa, M. Slater, J. Ramos-Quiroga and P. Lusilla Palacios (2023) [Virtual Self-Conversation Using Motivational Interviewing Techniques To Promote Healthy Eating And Physical Activity: A Usability Study.](#)
- ❖ Dimitra Anastasiadou, et al. (2024) [Clinical Efficacy of a Virtual Reality Tool for the Treatment of Obesity: Randomized Controlled Trial, JMIR.](#)












Other Uses of ConVRSelf

- ❖ van Gelder, J.L., Cornet, L.J.M., Zwalua, N.P. et al. (2022) *Interaction with the future self in virtual reality reduces self-defeating behavior in a sample of convicted offenders*. Sci Rep 12, 2254
- ❖ Moreah Zisquit , Anat B. Klomek, Alon Shoa, Mel Slater, Bernhard Spanlang, Doron Friedman (2025) *Intrapersonal Emotion Regulation Training in Virtual Reality: Embodying Self-Talk*, Springer Virtual Reality (accepted)
- ❖ Moreah Zisquit, Alon Shoa, Ramon Oliva, Stav Perry, Anat Brunstein-Klomek, Mel Slater and Doron Friedman (2025) *AI-Enhanced VR Self-talk for Psychological Counseling: A Formative Qualitative Study*, JMIR (accepted)
- ❖ Other work in progress
 - ❖ Self counselling of oncology nurses in Japan
 - ❖ Smoking addition, speak to a future self who has given up smoking
 - ❖ Depression
 - ❖ ...



Reality built for two: a virtual reality tool



Authors:  [Chuck Blanchard](#),  [Scott Burgess](#),  [Young Harvill](#),  [Jaron Lanier](#),  [Ann Lasko](#),  [Mark Oberman](#),
 [Mike Teitel](#) [Authors Info & Claims](#)

I3D '90: Proceedings of the 1990 symposium on Interactive 3D graphics • February 1990 • Pages 35–36 • <https://doi.org/10.1145/91385.91409>

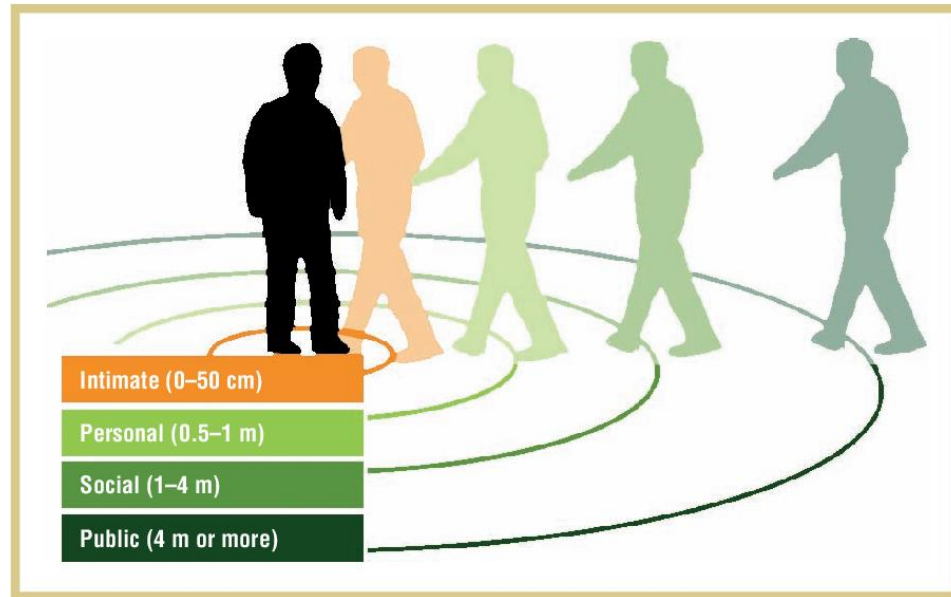




My first encounter with shared VR (199?)

An engineer from Division Ltd
entered me into a shared VR

I was shocked at how uncomfortable I felt
when his avatar invaded my personal space



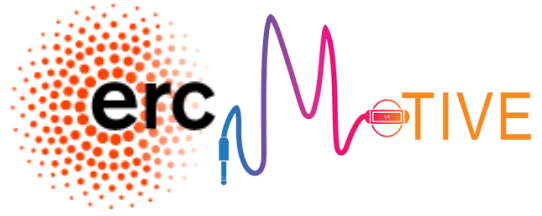
<https://www.virtual-reality-shop.co.uk/provision-100-vr-turnkey-system/>

Proxemics theory – Edward Hall

Figure from Informing the Design of Proxemic Interactions
Nicolai Marquardt, S. Greenberg (2012) IEEE Pervasive
Computing.



VR United



- ❖ A shared VR where avatars look like the corresponding person.
- ❖ Developed by Ramon Oliva, Alejandro Beacco, Jaime Gallego.
- ❖ Here Ramon explains the idea to others...





David Chalmers (NYU) and John Thornhill (FT) used VR United for a 2 hour interview in a restaurant setting.

Lunch with the FT

Lunch with the FT Life & Arts

+ Add to myFT

David Chalmers: 'We are the gods of the virtual worlds we create'

The techno-philosopher on meaningful life in the metaverse, building virtual utopias and why the 'corporatocracies' are becoming part of our brains



Feedback





Presence

Realistic
Avatar

Copresence

Interplay with
the real world

Things can go
wrong

Interaction
with virtual
objects leads
to violations of
physics

Real world
interferes

In a real place

Social norms



Including AI

- ❖ A VR United conference panel in “XR for the people”
 - ❖ David Chalmers (Australia), Prof. **New York University**
 - ❖ Doron Friedman (Israel), Prof. **Reichman University**
 - ❖ Myself (Spain)
 - ❖ A special celebrity guest
- ❖ Moderator - Jeremy Fogel, Prof., Tel Aviv University
- ❖ Live audience watching the VR Panel on a large screen
Research with Prof. Doron Friedman

ARL SYMPOSIUM:
XR FOR THE PEOPLE
SCIENCE, TECHNOLOGY, APPLICATIONS & IMPLICATIONS
June 13th 2022, 12:00
Reichman University
Chais Auditorium (CL05), Arazi-Ofer building

Speakers & panelists: Jeremy Bailenson, David Chalmers, Mel Slater, Doron Friedman, Jeremy Fogel, Anat Brunstein Klomek, Gurit Birnbaum, Amir Amedi, Alex Mintz, Niron Hashai, Daniel Landau, Tsahi Hayat, Beatrice Hasler, Shai Benbasat, Momi Zisquit, Ronit Elyoseph, Dan Pollak, Maya Shekel, XR Health, Snap, Tetavi, Khronos Group and Hexa

Logos: UR50, GUEST XR, KHRONOS GROUP, SOCRATES, AR51








Talk with a CBT Counsellor

We are exploring the use of ChatGPT as a CBT counsellor

Results so far are encouraging that it is possible at all

LLMs work by analysing vast amounts of text data to learn the patterns and context of language

While watching the video remember that this is purely a deep learning method – there is no human at the other end.





Problems

- ❖ This was tested in a study
- ❖ Given the choice amongst several alternative approaches including mindfulness people have tended to choose the AI counsellor
- ❖ Latency is a problem, though has improved by a factor of about 5 in a matter of weeks
- ❖ We cannot be sure that the ChatGPT agent will always offer appropriate advice
- ❖ The deployment of LLMs raises ethical concerns, including issues related to bias, misinformation, and the potential for misuse.



Working with a Patient Group



- ❖ Mavi Sanchez-Vives (IDIBAPS, Barcelona) is leading a project on using VR for the alleviation of lower back pain.
- ❖ Patients are loaned the Quest 3 head-mounted display in their homes and carry out exercises over several weeks.
- ❖ Then they meet with each other and the specialist doctors in VR for group discussions.
- ❖ The patients like it, because they don't have to travel, and feel that they can say things that they might not say in person.
- ❖ They meet all the other patients.
- ❖ Each person looks like themselves.







- ❖ Possible to have group meetings
 - ❖ In VR, Mixed Reality, and Augmented Reality including on a mobile.
- ❖ There could be an AI agent helping the meetings to fulfil their objectives
 - ❖ This is the goal of the GuestXR project
- ❖ There could be another AI agent that watches over the first one to make sure that it is giving appropriate advice (a ‘meta agent’).



environMENTAL – Agency & Control in Health: Positive Impacts



- ❖ Growing evidence suggests that climate change impacts mental health both individually and collectively.
- ❖ Engaging in climate action and community-based approaches can improve mental health when addressing environmental problems, with a focus on promoting community-led initiatives.
- ❖ **Sense of Agency & Control.**
 - ❖ Can be protective against mental health issues.
 - ❖ Encouraging action-taking and community engagement can improve resilience and reduce distress.
 - ❖ Opportunities for young people to take action, such as through school-based programs, can increase hope, agency, and resilience.

Corvalan et al. (2022) Epidemiology and Psychiatric Sciences
Hickman et al. (2021) Lancet Planetary Health
Lawrance et al. (2022) Lancet Planet Health
Kumar et al. (2024) Annals of Global Health
Hurley et al. (2022) Lancet Planet Health
Hwong et al. (2022) Lancet Planet Health
Leiserowitz et al. (2023) Yale University and George Mason University

...ners,
...ervention.



Conclusion

- ❖ These findings tie up with our VR study preliminary results that the more that individuals took action the less their distress in the Best-Worst condition
- ❖ This is not a recipe for ‘activism’ it is an observation
- ❖ For ConVRSelf it gives a starting point for a conversation (we don’t want people to become uninterested in environmental change but to nevertheless have good mental health).
- ❖ The observation ties up with the idea of the group discussions which themselves can grant agency to people, and be a starting point for conversation.





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(Co-Director)



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Pol Herrero



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Doron Friedman
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kiin.tech