

# Symposium AI & the future of mental healthcare

23rd of June

Comissiekamer 3, Aula TU Delft

**About:** Our symposium brings together leading experts to explore how Artificial Intelligence (AI) is transforming the future of mental health care. Digital Health Interventions (DHIs) powered by AI hold great promise for delivering accessible and personalized mental health care. A rising number of mental healthcare interventions are incorporating AI into mental health support, for example as chatbots, prediction algorithms, and AI diagnostics.

During this symposium experts will highlight cutting-edge approaches that personalize mental health support and expand access to care, from adaptive digital coaching to community-centered interventions and emotionally intelligent robotics. We will also learn from PhD students about their ongoing work, and engage in discussions on the opportunities and challenges of AI for mental health care. As AI becomes embedded in chatbots, diagnostics, and behavior change tools, we face both unprecedented promise and important ethical considerations. Join us for a thought-provoking afternoon where we bridge research, innovation, and equity to rethink what mental health care and support can look like in the digital age.

**Preliminary program June 23, 10:00 AM – 4:00 PM**

**10:00 – 10:30**

Welcome & Introduction – Iulia Lefter and Caroline Figueroa

**10:30 – 11:15**

Speaker 1: Willem Paul Brinkman

*From One-Size-Fits-All to One-of-a-Kind: Adaptive Behaviour Change through Digital Coaching*

*15 min break*

**11:30 – 12:15**

Speaker 2: Adrian Aguilera

*Developing Digital Innovations to Improve Mental Health Among Underserved Communities*

**12:15 – 13:15**

**Lunch Break**

**13:15 – 14:00**

Speaker 3: Emilia Barakova

*Stress and pain regulation in mental healthcare through connected systems of Social Robots and Wearables*

**14:00 – 15:00**

PhD Flash Talks and posters

**15:00 – 15:45**

Interactive Session / Panel Discussion with All Speakers

**15:45 – 16:00**

Closing Remarks – Iulia and Caroline

Overview of speakers:

**Speaker 1: Willem Paul Brinkman**

**Title: From One-Size-Fits-All to One-of-a-Kind: Adaptive Behaviour Change through Digital Coaching**

In this talk, I will present our recent work on personalised digital coaching systems that adapt interventions in real-time. These systems aim to offer more appropriate support by tailoring their guidance to the individual's context and longer-term goals. At the heart of our approach lies Reinforcement Learning (RL), a branch of artificial intelligence that enables the digital coach to learn from user responses and refine its support strategies over time. Rather than relying on a fixed path, the coach selects from a broad repertoire of exercises, choosing the one most likely beneficial at that moment and in the long term. I will illustrate this approach through studies in the domain of smoking cessation, where we explored how RL can improve user engagement. These findings offer a glimpse into how intelligent digital coaches can help people change their behaviour.

**Bio:** Willem-Paul Brinkman is an associate professor at Delft University of Technology, The Netherlands. His primary research interests are human-computer interaction, human-centred artificial intelligence, behaviour change support systems, specifically eHealth. He is fascinated by eHealth systems that include artificial social agents (conversational agents) that offer psychological assessment, support, therapy, or training. His ultimate objective is to establish an (semi)autonomous eHealth system with a digital psychologist that can assist individuals in achieving a broad set of behaviour change goals ranging from overcoming mental illness to lifestyle modification for coping with a chronic illness. He is, therefore, determined to build these systems and establish an empirically grounded understanding of them. For this, he works on several research grants that focus on these types of eHealth systems such as a home-based virtual reality therapy system for patients with social anxiety, an autonomous e-mental health application for posttraumatic stress disorder patients, and also artificial social agents for people with sleeping problems, depression, nicotine addiction.

## **Speaker 2: Adrian Aguilera**

### **Title: Developing digital innovations to improve mental health among communities with limited access to high quality care**

Dr. Aguilera will discuss the need for developing digital innovations to improve mental health among communities with limited access to high quality care. He will provide examples of interventions leveraging machine learning and community partnerships to improve effectiveness and reach.

**Bio:** Adrian Aguilera, Ph.D., is an Associate Professor in the School of Social Welfare at UC Berkeley and the Department of Psychiatry and Behavioral Sciences at UC San Francisco. At UC Berkeley, Dr. Aguilera directs the Digital Health Equity and Access Lab (dHEAL). Dr. Aguilera is trained as a clinical psychologist and is an expert in cognitive and behavioral approaches to treating depression and anxiety. His research is focused on utilizing mobile phone technologies and data science to implement mental health interventions to address health disparities in low-income and marginalized populations. He is passionate about leveraging digital health for equity. He leads work in innovative digital health interventions that are designed with and for underserved communities and conducts pragmatic, real-world implementations in public sector and community-based settings. He partners with community organizations to leverage capacity and conduct research that is relevant to their needs. He has extensive formal training in implementation science for equity, community-based research

methods and integrating cultural sensitivity all while developing innovative digital technology-based interventions.

### **Speaker 3: Emilia Barakova**

#### **Title: Stress and pain regulation in mental healthcare through connected systems of Social Robots and Wearables**

Addressing pain and stress as interconnected factors is crucial in providing comprehensive care and improving the well-being of different users. Individuals with intellectual disabilities, older adults with dementia, and children with Autism Spectrum Disorder (ASD), face challenges in accurately expressing their discomfort, pain, and worries. To address these issues, our research leveraged interaction design methods that combine robots, wearables, and mobile apps, to transform social robots into effective tools for promoting positive affect, and distraction from pain and loneliness during assistive tasks. In our robot-assisted therapies, we integrated contextual aspects such as a hospital or care home settings, individual patient/client journeys, and personal needs, along with the active involvement of caregivers and parents. Through this multidimensional approach, we aimed to enhance the overall efficacy and impact of assistive robots, providing tailored support to diverse user populations, and facilitating their well-being and quality of life.

**Bio:** Bio: Emilia Barakova is an Associate Professor in Social Robots and Embodied Intelligent Agents. She received her Ph.D. in Mathematics and Natural Sciences from the University of Groningen in 1999, and her master's degree in Electronics and Automation engineering from the Technical University of Sofia in Bulgaria. She is presently affiliated with the Industrial Design department and serves as the Head of the Social Robotics Lab at the Eindhoven University of Technology and leads the Transdisciplinary Research & Design research cluster. She formerly worked at Riken Brain Science Institute, Wako-shi, Japan, the German-Japanese Robotics Research Lab, Kitakyushu, Japan, the University of Groningen in the Netherlands, and the Bulgarian Academy of Sciences.

Barakova specializes in embodied social interaction with and through technology and social and cognitive robotics. Her present research focuses on the use of social robots for enhancing the mental well-being of people with intellectual disabilities, dementia, visual impairments and education and special education (i.e. children with autism spectrum disorders). Barakova has served as the program and general chair for several conferences (including IJSR, IEEE RO-

MAN, and IEEE Hybrid Intelligent Systems), and she is an Associate Editor of the International Journal of Social Robotics, Personal and Ubiquitous Computing, Interaction Studies, and Transactions of Human-Machine Systems.