



Master's thesis topics 2025-2026

DIS website: <https://www.dis.cwi.nl/>

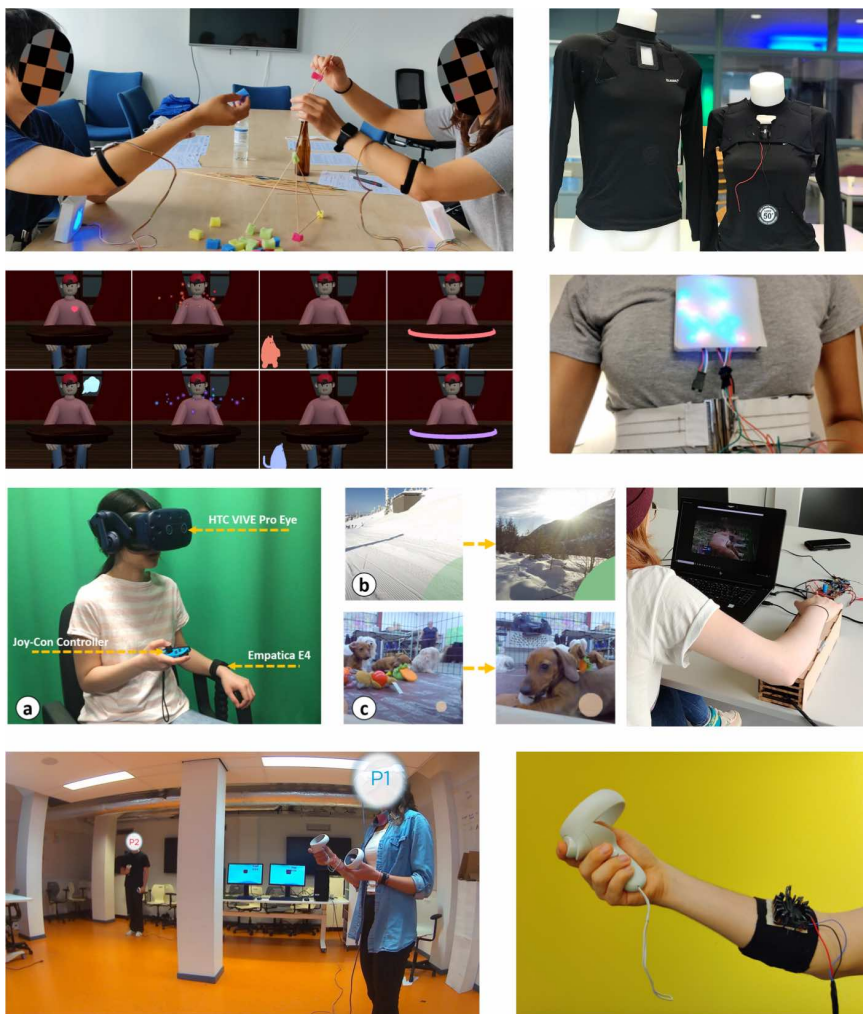
CWI website: <https://www.cwi.nl/>

Contact:

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- Master's students in Human Computer Interaction, Artificial Intelligence, Cognitive (Neuro-)science and/or Industrial Design across any (Dutch) university / institute are welcome to apply.
- You will be doing a scientific internship with us here in Amsterdam as part of your master's thesis project and/or I will act as external advisor.
- I strongly encourage publishing your work at top-tier conferences (e.g., CHI, UbiComp, CSCW, ...), and will mentor you as such.

- If the topics below interest you, get in touch by email, and will share more detailed information.
- You are welcome to propose your own topic, so long as it's within the broad areas of **Human Computer Interaction, Affective Computing, eXtended Reality (AR/VR/MR), or Human-AI Interaction.**

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Topic: Affective Haptics for (Social) Virtual Reality

Contact: Abdallah El Ali (aea@cwi.nl)

Description:

Haptic stimulation is an intrinsic aspect of sensory and perceptual experience, and is tied with several experience facets, including cognitive, emotional, and social phenomena. The capability of haptic stimuli to evoke emotions has been demonstrated in isolation, or to augment media. This project will build on our prior work on visualizing biosignals [1,2,3,4], and exploring virtual agent biosignals through haptic displays, to create new forms of social experiences in social VR that leverage physiological signals and body-based actuation.

[1] Abdallah El Ali, Xingyu Yang, Swamy Ananthanarayan, Thomas Rögglä, Jack Jansen, Jess Hartcher-O'Brien, Kaspar Jansen, and Pablo Cesar. 2020. ThermalWear: Exploring Wearable On-chest Thermal Displays to Augment Voice Messages with Affect. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–14.

<https://doi.org/10.1145/3313831.3376682>

[2] Sueyoon Lee, Abdallah El Ali, Maarten Wijntjes, and Pablo Cesar. 2022. Understanding and Designing Avatar Biosignal Visualizations for Social Virtual Reality Entertainment. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 425, 1–15.

<https://doi.org/10.1145/3491102.3517451>

[3] A. El Ali, R. Ney, Z. M. C. van Berlo and P. Cesar, "Is that My Heartbeat? Measuring and Understanding Modality-Dependent Cardiac Interoception in Virtual Reality," in IEEE Transactions on Visualization and Computer Graphics, vol. 29, no. 11, pp. 4805-4815, Nov. 2023, doi: 10.1109/TVCG.2023.3320228.

Skills:

- Required: Information visualization (sketching + prototyping); biosensors (e.g., HR, EDA, EMG); HCI research methods; quantitative and qualitative analysis; statistics
- Recommended: Hardware prototyping (e.g., Arduino), fabrication, thermal, vibrotactile, and/or multimodal output

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Topic: Exploring Embodiment and Agency for Human Augmentation in Extended Reality

Contact: Abdallah El Ali (aea@cwi.nl)

Description:

This topic pertains research on enhancing human abilities (human augmentation), and how it can manifest through different scenarios e.g., virtual avatar co-embodiment, or systems that can enable social breath awareness.

In this topic, you have the opportunity to imagine a new sky in HCI, and work with physical or digital computational systems to enable / unlock new ways of interaction. I also encourage topics related to accessibility, and new way of interaction for individuals with sensory and/or motor impairments.

[1] Karthikeya Puttur Venkatraj, Wo Meijer, Monica Perusquía-Hernández, Gijs Huisman, and Abdallah El Ali (2024). ShareYourReality: Investigating Haptic Feedback and Agency in Virtual Avatar Co-embodiment. In Proc. CHI '24, ACM, NY, USA, 1–14.

<https://doi.org/10.1145/3613904.3642425>

[2] Abdallah El Ali, Ekaterina R. Stepanova, Shalvi Palande, Angelika Mader, Pablo Cesar, and Kaspar Jansen. 2023. BreatheWithMe: Exploring Visual and Vibrotactile Displays for Social Breath Awareness during Colocated, Collaborative Tasks. In Proc. CHI EA '23, ACM, NY, USA, 1–8. <https://doi.org/10.1145/3544549.3585589>

Skills:

- Required: Electronics (e.g., Arduino), programming (e.g., Android, C#), user evaluation, quantitative analysis
- Recommended: interest in sensors, actuators and design, AR/VR, quantitative and qualitative analysis

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Topic: Transparent and Trustworthy Human-AI Interaction

Contact: Abdallah El Ali (aea@cwi.nl)

Description:

When dealing with AI-generated or AI-edited content, AI system disclosures (such as AI labels) can influence users' perceptions of media content [1]. For example, effective AI labels can enable viewers to immediately recognize AI's involvement, allowing them to quickly evaluate source credibility, verify the accuracy of the content, acquire contextual knowledge, and make informed decisions around the trust and authenticity of such content.

This topic includes several sub-topics:

(1) Remote audience engagement with news using behavioral and physiological sensors: This project explores remote or in-situ sensing of audience engagement using a range of behavioral and physiological sensors. The research will focus primarily on objective measures of human engagement (e.g., using computer vision for head tracking) to infer engagement with the news. This topic is a collaboration with the AI, Media, Democracy lab (<https://www.aim4dem.nl/>). More details per request.

(2) User perceptions of human and AI news using voice assistants: This topic explores user perceptions of human and AI-generated news delivered using a range of voice assistants (see e.g., [2]).

(3) Intelligent disclosure-aware user interfaces

(4) Intelligent visualization techniques for disclosures

These topics are in collaboration with the AI, Media, Democracy lab (<https://www.aim4dem.nl/>), where the master's student is expected to be part of. More details per request.

Skills (can differ by topic):

- Sensors; computer vision; signal processing; visualization; HCI research methods; quantitative and qualitative analysis
- Recommended: Interest in physiological and behavioral sensing; interest in journalism and news media

[1] Abdallah El Ali, Karthikeya Puttur Venkatraj, Sophie Morosoli, Laurens Naudts, Natali Helberger, and Pablo Cesar. 2024. Transparent AI Disclosure Obligations: Who, What, When, Where, Why, How. In Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems (CHI EA '24). Association for Computing Machinery, New York, NY, USA, Article 342, 1–11. <https://doi.org/10.1145/3613905.3650750>

[2] Shruti Rao, Valeria Resendez, Abdallah El Ali, and Pablo Cesar. 2022. Ethical Self-Disclosing Voice User Interfaces for Delivery of News. In Proceedings of the 4th Conference on Conversational User Interfaces (CUI '22). Association for Computing Machinery, New York, NY, USA, Article 9, 1–4. <https://doi.org/10.1145/3543829.3544532>