Master's thesis topics 2022 at CWI DIS

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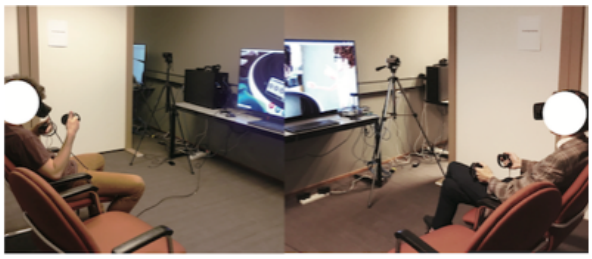
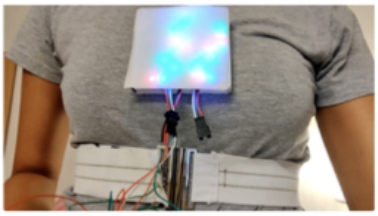

- Master's students in Human Computer Interaction, Artificial Intelligence, Cognitive (Neuro-)science and/or Interaction Design across any Dutch university / institute are welcome to apply
- You will be doing a scientific internship with us here in Amsterdam as part of your master's thesis project
- We strongly encourage publishing at top-tier conference venues (e.g., CHI, UbiComp, …), 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 **Artificial Intelligence**

Area:
Ubiquitous Computing; Human-Computer Interaction; Machine Learning

Topics:
1. Biosignals in wearable / extended reality (XR) environments
2. Classifying human breathing in virtual reality
3. Inter-personal synchrony in virtual reality
4. Multimodal mood smartphone input

Skills:
- Required: biosensors (ECG, EDA, RSP, ...), camera sensing, image and signal processing; quantitative analysis, HCI research methods
- Topic-specific: Unity/C# (if focus is on VR settings); machine learning + deep learning (if ML focused project); computer vision; mobile development (e.g., Android)

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Area:
Artificial Intelligence; Machine Learning

Topics:
1. Generative models for physiological signals
2. Self-supervised learning for physiological signals

Skills:
- Required: Machine learning, generative models (e.g. GAN, VAE, Attention), deep learning networks (e.g. CNN, LSTM, DBN), classical machine learning models (e.g. SVM, KNN, Bayesian networks), Python
- Topic-specific: Physiological signal processing (ECG, GSR, EEG, RSP, etc.), self-supervised representation learning, basic knowledge about computational study of human emotion

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Area:
Design Engineering; Human-Computer Interaction

Topics:
1. Affective, multimodal journalism
2. Emotion self-reports across the senses
3. Wearable affective thermal displays
4. Multimodal breathing displays
5. Cross-reality emotion displays

Skills:
- Required: Electronics & hardware prototyping (e.g., Arduino), controlled user studies, statistics
- Topic-specific: Unity/C# (if focus is on VR settings), GUI development (mobile or desktop), qualitative analysis

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Area:
Interaction Design; Human-Computer Interaction

Topics:
1. Designing biofeedback experiences
2. Biosignal acceptability
3. Emotion self-report techniques in virtual reality
4. Emotion and social presence in virtual reality

Skills:
- Required: information visualization (sketching + prototyping); HCI / design research methods
- Topic-specific: C#/Unity (if focus is on VR environments), C/C++/Arduino (if focus is on tangible prototypes), biosensors (ECG, EDA, RSP, ...); quantitative + qualitative analysis