



Master's thesis topics 2023-2024 at CWI DIS

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

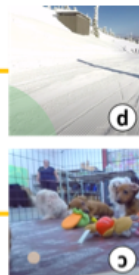
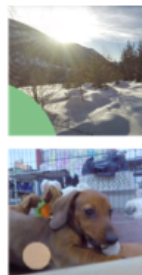
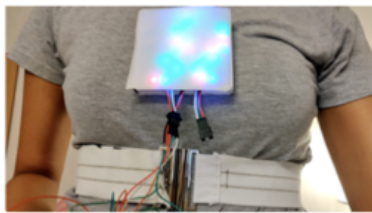
CWI website: <https://www.cwi.nl/>

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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 physical and virtual reality
4. User perceptions of Human and AI news
5. Remote audience engagement with news using behavioral and physiological sensors

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. Immersion and presence in 360° Videos
2. Wearable affective thermal displays
3. Haptic interfaces for biosignal visualization

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

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