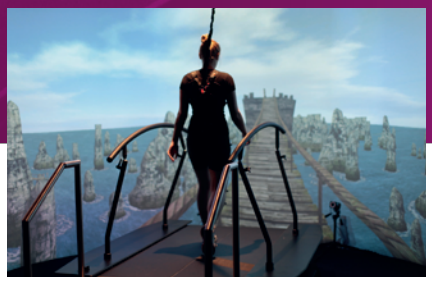
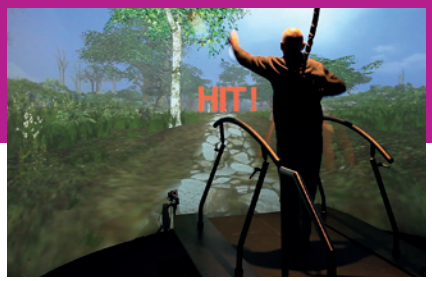
Virtual Reality and Sound Add-On for M-Gait

Extend the M-Gait's research options by intergrating an interactive and dynamic Virtual Reality (VR) system, including a surround sound system. The design of the M-Gait allows an upgrade to integrate VR with the instrumented treadmill. Create real-time interactions between any parameter measured by the system and the VR environment. The surround sound system adds to the immersive experience.





Generate One Integral Image

The VR set-up can consist of a 180 degree semi-cylindrical or a flat screen projection. Additional vertical projection on the belt is also possible. Depending upon the configuration, the D-Flow software uses up to four projectors to generate one integral image of the VR environment.

Use Real-Time Feedback

Use the force data from the treadmill, or other data streams, to respond to, or influence the VR interactions. Real-time feedback on performance measures can be used to develop effective rehabilitation protocols, applied games or advanced research protocols.

Encourage Interaction

Various default VR scenes are available, but D-Flow can also be used to create your own environment. Create auditory cues, or visual cues on the screen in front of the treadmill to encourage interaction by the subject. Allow VR objects, or even complete scenes, to interact with any data stream in the system to challenge specific movement or actions. Vertical projection on the walking surface enables Augmented Reality application development.

Key Features

- Flat (all sizes possible) or 180 degree semi-cylindrical projection. Vertical projection on the belt is possible as well.
- Surround sound system.
- Real-time rendering of the interactive VR environment.
- Modular system, allowing for enhancements and integration with, for example, 3D motion capture and treadmill pitch / sway.
- D-Flow system control and application development software.

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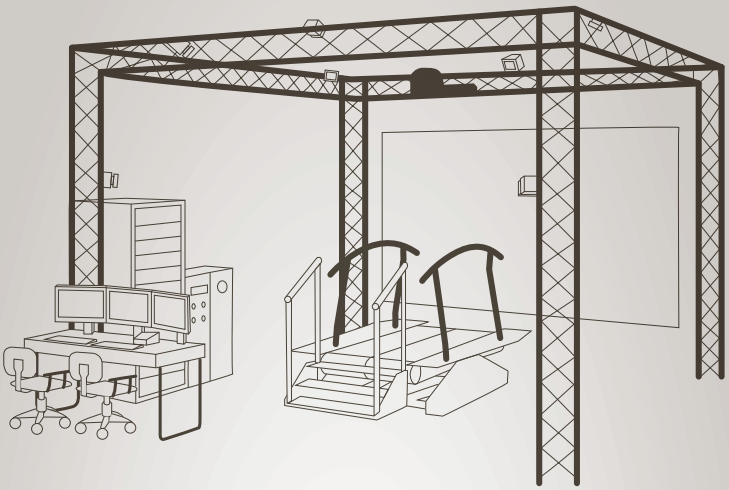
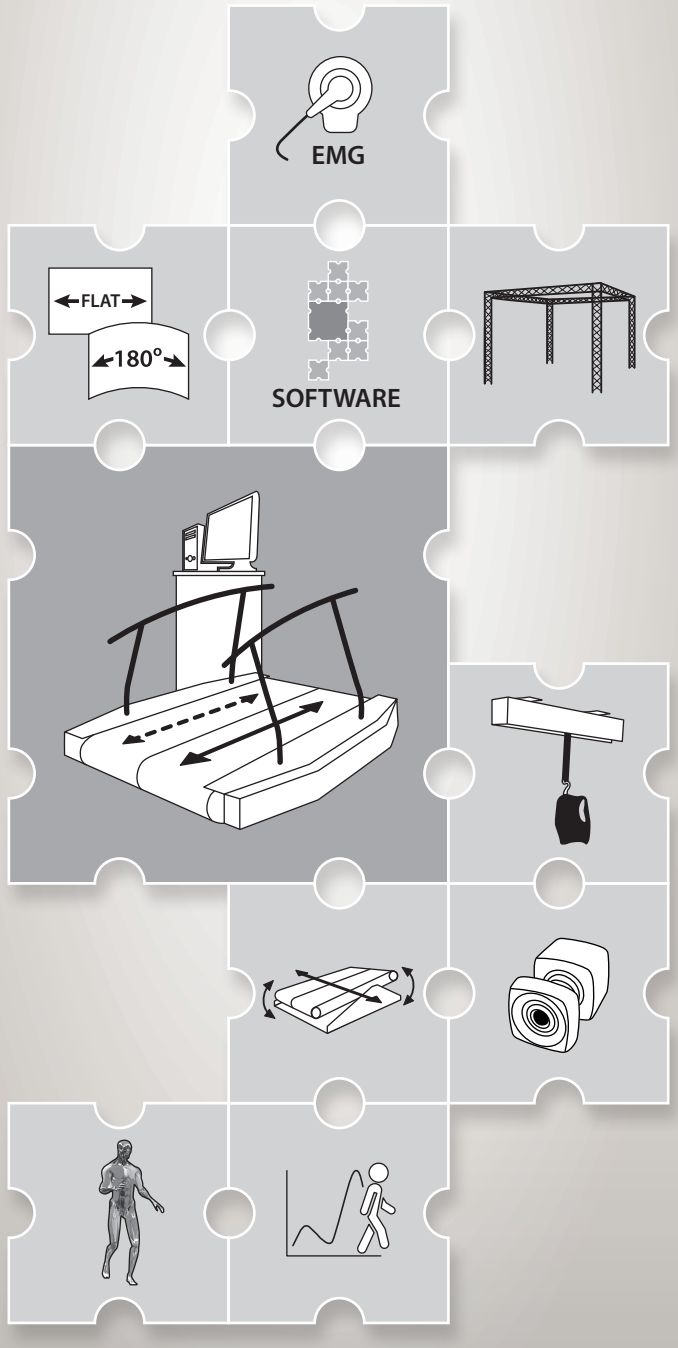
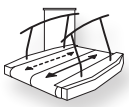
Modular system





Various system enhancements are possible to increase both the clinical and research possibilities of the M-Gait.

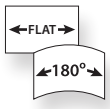


Treadmill
An instrumented dual-belt treadmill with individually controllable belts measuring 3D ground reaction forces of each leg independently.

Pitch and/or sway
A pitch and/or sway unit can be added to the treadmill for walking uphill & downhill or to apply medial-lateral perturbations of the walking surface.

Software
The D-Flow software provides real-time system control and an application development environment using visual programming. Add different modules to the D-Flow software to extend the functionality.

Motion Capture
Integrate a 3D motion capture system to collect motion data for movement analysis or to control real-time feedback applications for training.



Virtual Reality Environment
Create a high-end Virtual Reality environment with a large flat screen or a truly immersive experience with the 180° projection screen and the surround sound audio system. Enhance even further with a 3D stereoscopic projection.

Truss
A custom build truss facilitates optimal flexibility for motion capture camera mounting and provides a fully integrated solution for the other system components and cabling.

Body Weight Support
Facilitate functional gait training by providing partial body weight support. The amount of support can easily be adjusted to meet the needs of the subject.

Electromyography
Add low latency wireless electromyography (EMG) to measure muscle activation for movement analysis or use it to control a real-time biofeedback application for training.

Human Body Model
Use the full body musculoskeletal Human Body Model for advanced real-time biomechanical analysis and to visualize joint rotations, joint moments and muscle forces for training.

Gait Package
Add clinical gait analysis to the setup including a set of gait assessment and training applications, three reference video cameras and an offline analysis tool for intuitive data analysis.

Miscellaneous
Various other hardware sensors and systems can be integrated, for example video cameras, accelerometers, electroencephalography (EEG) or functional electro stimulation (FES).

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