



St. Xavier's Gait Lab

In Collaboration with OREC, Marquette University, Milwaukee, WI, USA.

Xavier Institute of Engineering



Motion Analysis Technology (Mat)

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What is Gait Analysis?

Gait analysis is used for measuring body movements, and muscle work during walking; also, it aids directly in the treatment of individual patients with walking difficulties. Most observations and radiographs are inadequate to assess the dynamic movements during walking. More comprehensive and detailed assessments are required to prescribe an effective treatment plan. St. Xavier's Gait Lab uses one of the advanced motion capture technology to monitor human mechanics including; motion and forces during walking. This technology lets clinicians evaluate motion from a distance without interference from retro-reflective sensors, as it is a non-invasive procedure.

How does it work?

We have 12 Miquis M3 Qualisys camera of 2 MP with 340FPS in normal mode which can go up to high speed and 2 Miquis colour video camper 85FPS in full HD. We have single AMTI Force Plates. We use a Miquis M3 cameras to capture data and qualisys PAF software to process the data. 18mm reflective markers are position with taped on specific points on the patient's body. By tracking the marker positions, we can calculate how the patient's joints bend and the body moves as the patient walks. We use force plates embedded in the floor to measure how the patient's foot supports the body weight. Custom software then calculates the torque and power generated by the patient's joints during walking. Visual 3D software we use to mark event (Right and left heel strike, right and left toe off, right and left force on and right and left force off) followed by which report is made.



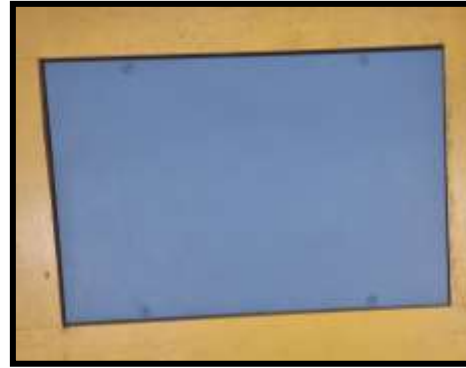
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Miqus camera



AMTI Force plate

Who can benefit from Gait analysis?

Many children with cerebral palsy (CP), spina bifida and other neuromuscular conditions have difficulty walking. Walking, stepping, or running can be unsteady or awkward resulting in falls or even injuries. As children grow, gait problems can become worse due to changes in the bone or severe muscle tightening. When left untreated, gait problems can lead to pain, fatigue, weakness, and/or loss of walking ability. Children for whom surgery is an option will be referred for a gait analysis. A detailed physical assessment will be performed followed by motion analysis. The report will be available in 3 -4 days and this will help the surgeon and therapist in planning the treatment of the individual child.

Motion analysis may benefit patients with the following medical conditions:

- Osteogenesis Imperfecta
- Cerebral Palsy
- Myelomeningocele
- Charcot-Marie-Tooth Disease (HSMN)
- Clubfoot
- Limb Deformities



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How long it takes?

The screening usually takes 45 mins- one hour. A short video and 3D view will be generated to have a sneak peek of the walking pattern. The In-depth report will include a graphical display of the angles of the foot, knee, hip, pelvis, thorax, and upper body as compared to standard values. The report will also include the forces acting on the body as compared to normal values during walking. This tool provides the doctor with quantitative data for walking related problems, and load abnormalities by simple objective examination and video recording, letting the clinician see the motion more precisely.