

# A gait analysis data collection and reduction technique \*

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## Abstract

Davis, R.B., III, S. Öunpuu, D. Tyburski and J.R. Gage, 1991. A gait analysis data collection and reduction technique. *Human Movement Science* 10, 575–587.

The clinical objective of the gait analysis laboratory, developed by United Technologies Corporation (Hartford, CT, USA) in 1980, at the Newington Children's Hospital is to provide quantified assessments of human locomotion which assist in the orthopaedic management of various pediatric gait pathologies. The motion measurement system utilizes a video-based data collection strategy similar to commercially available systems for motion data collection. Anatomically aligned, passive, retroreflective markers placed on the subject are illuminated, detected, and stored in dedicated camera hardware while data are acquired from force platforms and EMG transducers. Three-dimensional marker position information is used to determine: (i) the orientation of segmentally-embedded coordinate systems, (ii) instantaneous joint center locations, and (iii) joint angles. Joint kinetics, i.e., moments and powers, may also be computed if valid force plate data are collected.

## Introduction

Gait analysis is the systematic measurement, description, and assessment of those quantities thought to characterize human locomotion. Through gait analysis, kinematic and kinetic data are acquired and analyzed to provide information which describes fundamental gait characteristics and which is ultimately interpreted by the clinician(s) to form an assessment. The clinical application of gait analysis allows the clinician to evaluate quantitatively the degree to which an individual's

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In general, the technically oriented research activities in the laboratory are focussed on the refinement of the data collection and reduction to improve the effectiveness of the information that is provided to the clinician for decision making.

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