

## Multibody models for gait analysis

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*Abstract:* The aim of this study was to create multibody biomechanical models for normal gait analysis. Proposed models can be used to identify joint moments of the lower limbs during normal gait in the single support and the double support phase. Applying Newton-Euler formulation, six planar models were developed: 1) a mathematical 6DOF model describing a gait in the sagittal plane of the body for single support phase; 2) a mathematical 6DOF model describing a gait in the sagittal plane of the body for double support phase; 3) a mathematical 7DOF model describing a gait in the sagittal plane of the body for single support phase; 4) a mathematical 7DOF model describing a gait in the sagittal plane of the body for double support; 5) a mathematical 7DOF model describing a gait in the frontal plane of the body for single support phase; 6) a mathematical 7DOF model describing a gait in the frontal plane of the body for double support phase. Proposed mathematical models can be applied to solve a forward dynamic task or an inverse dynamic task. A validation of these models had been performed by comparing results measured over examination of normal human gait and results calculated by solving an inverse dynamic task.

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