

## Study of Gait Stability Evaluation Technique Based on Linear Inverted Pendulum Model

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**Abstract :** This research proposes a gait stability evaluation technique based on the linear inverted pendulum model and moving support foot Zero Moment Point. With this, an improvement towards the gait analysis of the orthosis walk is validated. The application of Lagrangian mechanics approximation to the solutions of the dynamics equations for the linear inverted pendulum does not only simplify the solution, but it provides a smooth Zero Moment Point for the double feet support phase. The Zero Moment Point gait analysis techniques mentioned above validates reference trajectories for the center of mass of the gait orthosis, the timing of the steps and landing position references for the swing feet. The stability evaluation technique are tested with a 6 DOF powered gait orthosis. The results obtained are promising for implementations.

**Keywords :** locomotion, center of mass, gait stability, linear inverted pendulum model

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