Dynamic Inversion for Wheeled Inverted Pendulum with Extra Joint using Singular Perturbation Technique

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- Proposed trajectory planning method for a wheeled inverted pendulum (WIP) that incorporates a linear joint atop the WIP body yields a stable joint trajectory that kinematic and dynamic constraints of the WIP.

- An asymptotically converging solution is obtained through the utilization of the singular perturbation technique in dynamic inversion.

- A simulation example is provided to verify the validity of the dynamic inversion based trajectory planning method.