

Optimizing Hexapod Robot Reconfiguration using Hexa-Quad Transformation

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Abstract

This paper presents a leg reconfigurable technique to optimize the hexapod robot reconfiguration flexibility. A hexapod-to-quadruped (Hexa-Quad) transformation technique is proposed to optimize hexapod legs on certain situation that need some legs to be disabled as a leg to do other tasks and operations. This proposed method used the factor of center of body (CoB) stability in the support polygon and its body shape. The reinitialized leg's shoulder method is proposed to ensure the support polygon is balanced and confirmed the CoM nearly or at the center. This method is modeled and simulated in a real-time based model of hexapod robot with 4-DOF/leg control architecture. The model is verified in numerical model and presented using separated 3D simulators.

Keyword: Center of Mass, Support Polygon, Traverse-trot gait, Tripod gait

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