

## **State Estimation for a Hexapod Robot**

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### **Abstract:**

This paper introduces a state estimation methodology for a hexapod robot that makes use of proprioceptive sensors and a kinematic model of the robot. The methodology focuses on providing reliable full pose state estimation for a commercially-available hexapod robot platform with the use of only commonly-available sensors. The presented methodology provides the derivation of the kinematic model and implements an Extended Kalman Filter (EKF) state estimation framework similar to that recently validated on a quadruped. The EKF fuses the kinematic model with on-board IMU measurements to estimate the pose of the robot. The methodology was tested with experiments using a physical hexapod robot and validated with independent ground truth measurements.