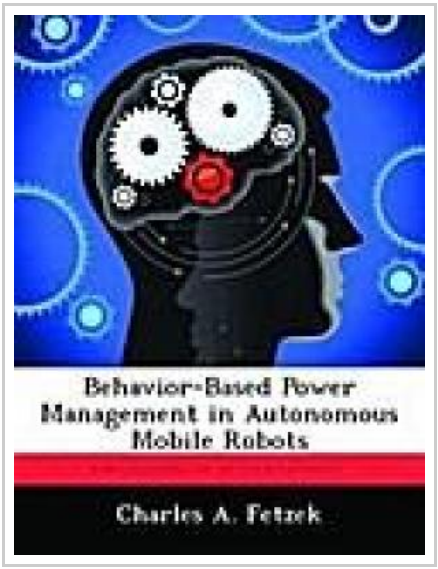

Behavior-Based Power Management in Autonomous Mobile Robots

By Charles A. Fetzek

Bibliioscholar Okt 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x6 mm. This item is printed on demand - Print on Demand Neuware - Current attempts to prolong a robot's battery life focus on outdated techniques that have high overhead and are not built in to the underlying robotic architecture. In this thesis, battery life is extended through development of a behavior-based power management system, including a Markov decision process (MDP) power planner. This system examines sensors needed by the currently active behavior set and powers down those not required. Predictive power planning models the domain as an MDP problem in the Deliberator. The planner creates a power policy that accounts for current and future power requirements in stochastic domains. This provides a power plan that uses lower-power consuming devices at the start of a goal sequence in order to save power for the areas where higher-power consuming sensors are needed. Power savings are observed in two case studies: Low and high sensor intensity environments. Testing reveals that in a real life scenario involving multiple goals and multiple sensors, the robot's battery charge can be extended up to 96% longer when using this system over robots that rely on traditional power management....

Reviews

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