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Evaluating battery charging and swapping strategies in a robotic mobile fulfillment system

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Highlights

- We build performance estimation models to explicitly investigate battery recovery.
- We develop a decomposition method to analyze models with two synchronization nodes.
- Ignoring battery recovery underestimates the number of robots and the system costs.
- Inductive charging performs the best in terms of retrieval throughput time.
- Battery swapping is cheaper than plug-in charging when battery costs are low.

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