Initial Post

◀ Initial post

Display replies in nested form

Settings

Initial Post

by Lauren Pechey - Friday, 24 October 2025, 2:12 PM

OOP Design for IoT

Object-oriented (OO) metamodels provide a structured and modular framework for developing Internet of Things (IoT) systems. They allow designers to model complex interactions between devices through abstraction, encapsulation, and inheritance. Baskara et al. (2024) illustrated this in their T-UFF warehouse tracking system, where sensors, microcontrollers, and communication modules were organised into reusable classes. This structure enhanced traceability and maintainability while improving operational efficiency.

However, traditional OO metamodels can become rigid when applied to large-scale or adaptive IoT environments. Their dependence on specific technologies and static communication flows limits scalability and real-time performance (Dang et al., 2023). Furthermore, they often neglect energy-efficient and intelligent edge processing essential for modern robotics applications (Gómez et al., 2022).

A humanoid robot metamodel could extend Baskara's design by integrating perception (sensors), cognition (AI modules), and actuation (motors) within an OO structure. Communication between these components via 5G or Wi-Fi supports distributed intelligence and adaptability. Overall, OO metamodels remain valuable for IoT but must evolve to embrace dynamic, intelligent, and low-latency systems to meet the needs of humanoid robotics.

References:

Baskara, W.P. *et al.* (2024) 'T-UFF (Tracker stuff): Application development for warehouse tracking', *IOP Conference Series: Earth and Environmental Science*, 1294(1), p. 012025.

Dang, L.M. *et al.* (2023) 'Internet of robotic things for mobile robots', *Digital Communications and Networks*, 9(6), pp. 1443–1459.

Gómez, C. *et al.* (2022) 'Reducing operational expenses of LoRaWAN-based Internet of remote things applications', *Sensors*, 22(20), p. 7778.

Maximum rating: -

Permalink Edit Delete Reply

◀ Initial post