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GhostAR: A Time-space Editor for Embodied Authoring of Human-Robot Collaborative Task with Augmented Reality

GhostAR uses motion capture of human movement to program precise task sequences for robots, enhancing manufacturing and human-robot collaboration through a self-contained, real-time visual simulation interface.

Engineers at Purdue University have developed an algorithm known as GhostAR that utilizes motion capture from human movement to create precise task sequencing for robots. The program enhances robotic manufacturing as well as development of human-robot collaboration. Programming a robot through augmented reality (AR) to perform tasks often leads to slow human-robot collaboration, issues with input inaccuracy from imaging to mimic tasks in situ, and creates reliance on editing offline. Human-computer interactions are made more natural through GhostAR's self-contained interface, which allows a machine to learn by robust motional mapping. The system allows for authoring work flows by using motion capture images as input to guide tasks and to ensure constant human-robot awareness. An interactive visual simulation is displayed to the user, which makes it easier to program robots as well as gives better feedback to robots without having to operate offline.

Advantages:

-Robust mimicking capabilities

-Enhanced authoring interfaces

-Heightened robotic awareness

-Realistic simulation and visualization

-Real-time iterative feedback loop

-User-friendly

-Efficient workflow

Technology ID

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Category

Artificial Intelligence & Machine Learning/Reinforcement & Federated Learning

Robotics & Automation/Simulation, Digital Twins, & Industrial Automation

Robotics & Automation/Perception & Sensing

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Potential Applications:

-Manufacturing

-Robotics

-Training

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Provisional-Patent, 2019-09-18, United States

Utility-Gov. Funding, 2020-09-16, United States

CON-Patent, 2024-11-05, United States

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