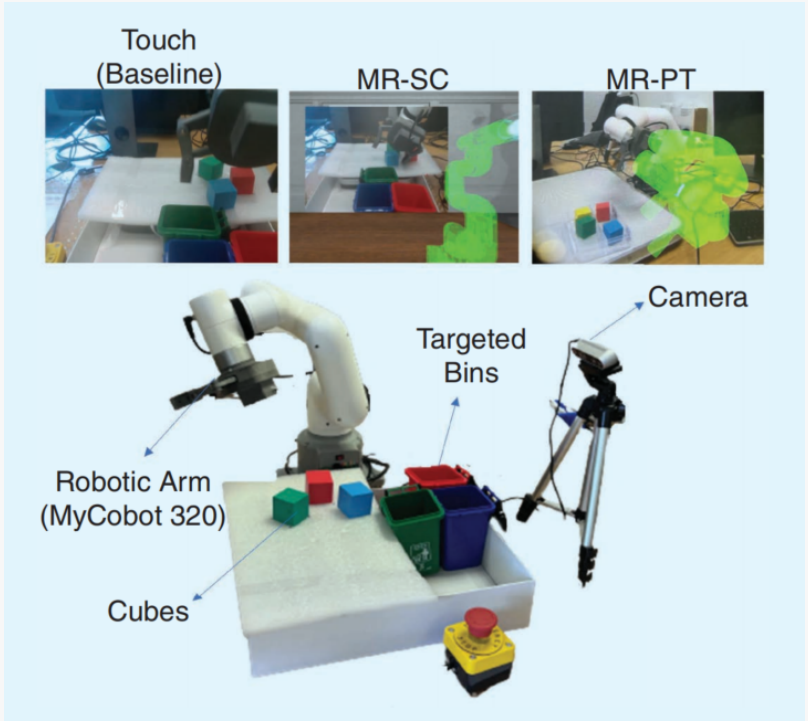
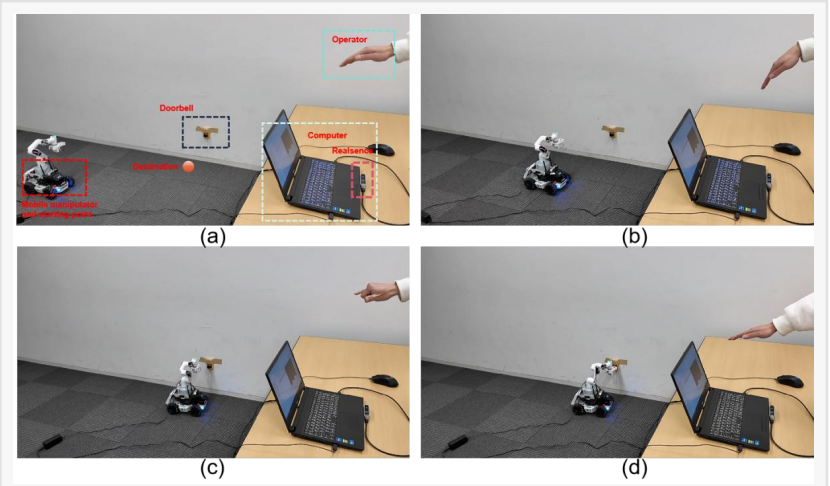
Elephant Robotics Unveils Academic Research Collection on Cobots, AGVs and Mobile Robots from Top Universities

Elephant Robotics launches academic research collection on Cobots, AGVs, and Mobile Robots from prestigious global universities.



SHENZHEN, GUANGDONG, CHINA, January 6, 2025 /EINPresswire.com/ -- In the ever-evolving landscape of robotics, the symbiosis between humans and machines takes center stage, marking the advent of a new era of innovation. With the development of robotics technology, the application fields of collaborative robots and compound mobile robots are becoming more and more abundant. Today, Elephant Robotics is thrilled to introduce a pioneering collection of academic papers focusing on Collaborative Robots (Cobots), Automated Guided Vehicles (AGVs) and compound mobile robots sourced from prestigious global universities, such as Carnegie Mellon University, University of California, Berkeley, Imperial College London, University of Bristol, The Hong Kong University of Science and Technology and Waseda University. This compilation delves into the transformative capabilities of Elephant Robotics' 6 DOF collaborative robots, myCobot series, mobile robot, myAGV and autonomous compound mobile robot, LIMO Cobot, highlighting the innovative applications of robotics technology in different fields.

From over 100 pioneering academic papers focusing on Elephant Robotics' robotic products from top global institutions, the company has meticulously selected 15 notable studies. This comprehensive collection illustrates how robotics technology is driving advancements across various sectors, including industry, healthcare, agriculture, construction, and manufacturing. It serves as a valuable knowledge repository, showcasing significant theoretical breakthroughs alongside significant practical applications, and providing a holistic perspective on the future of human-robot interaction and collaboration. Tailored for enthusiasts, professionals, and researchers alike, this collection is an essential resource for anyone looking to stay informed about the latest developments and innovations in the robotics field and industries.



Topic: FogROS2-LS: A Location-Independent Fog Robotics Framework for Latency Sensitive ROS2 Applications
Authors: Kaiyuan Chen, Michael Wang, Marcus Gualtieri, Nan Tian, Christian Juette, Liu Ren, Jeffrey Ichnowski, John Kubiatowicz and Ken Goldberg
Universities: University of California, Berkeley, Carnegie Mellon University
Abstract: This study presents FogROS2-LS, a framework designed for Fog Robotics in ROS2 applications needing low latency. It addresses latency issues in cloud robotics caused by network fluctuations by creating secure, fast connections between robots and cloud servers. FogROS2-LS enables robots to utilize cloud and edge devices for state estimators and controllers without altering their existing ROS2 applications. It automatically selects the best service deployment to meet latency requirements, allowing resource-limited robots to navigate safely in complex environments. The framework was tested with Elephant Robotics' mobile robot, myAGV, in collision avoidance and target tracking scenarios, showing strong performance in network recovery and continuous tracking. These results demonstrate FogROS2-LS's potential to enhance latency-sensitive robotic operations.

Topic: Toward Internet of Human and Intelligent Robotic Things With a Digital Twin-Based Mixed Reality Framework
Authors: Dandan Zhang, Ziniu Wu, Jin Zheng, Yifan Li, Zheng Dong, and Jialin Lin
Universities: Imperial College London, University of Bristol
Abstract: This article presents the HuBotVerse framework, designed to integrate humans with Intelligent Robot Things (IoHIRT). It emphasizes security, user-friendliness, manageability, and open-source accessibility, enabling various human-machine interaction interfaces for better collaboration. HuBotVerse includes multiple Human-Robot Interaction (HRI) interfaces to improve teamwork between humans and robots. It utilizes a digital twin (DT) mixed reality (MR)

interface for intuitive and immersive interactions, enhancing remote operation efficiency. Research using the 6 DOF collaborative robot arm, myCobot 320, supports the IoHIRT concept and HuBotVerse framework. By combining digital twin technology with mixed reality, HuBotVerse offers a strong solution for human-robot collaboration, particularly in homecare and healthcare applications.

Topic: A Novel Teleoperation Approach Based on MediaPipe and LSTM
Authors: Jianan Xie, Zhen Xu, Jiayu Zeng, Xiaohan Du, Yilin Zhang, Shanshan Wang, Hongming Chen, and Kenji Hashimoto
University: Waseda University
Abstract: This article introduces a new remote control method for mobile robots that allows operators to control compound mobile robots with one hand. The research team uses MediaPipe Hands technology and RGB-D cameras to accurately track 3D hand movements. By analyzing various hand features, they generate control commands. A gesture recognition model based on Long Short-Term Memory (LSTM) architecture achieves 100% accuracy in recognizing three gestures for switching control objects. The autonomous compound mobile robot, LIMO Cobot, serves as a testbed, using a custom inverse kinematics (IK) solver to translate hand positions into movements for the 6 DOF robotic arm, myCobot 280 M5. The IK solver calculates the necessary joint angles to reach a target position and activate a doorbell, confirming the effectiveness of the gesture-based remote control method.

Topic: AR-enhanced digital twin for human–robot interaction in manufacturing systems
Authors: Zhongyuan Liao, Yi Cai
University: The Hong Kong University of Science and Technology
Abstract: This paper introduces a system that combines Augmented Reality (AR) technology with Digital Twin (DT) capabilities to improve human-robot interaction (HRI) in manufacturing. The system operates at 3 levels of DT functionality: virtual twin for monitoring, hybrid twin for intuitive interaction, and cognitive twin for optimized operation. Using the 6 DOF robot arm, myCobot 280 Pi, as the test platform, user studies confirmed that the AR-enhanced DT system reduces operation time, lowers error rates, and improves user experience. This innovative system offers a promising solution for smart manufacturing by enhancing the intuitiveness and efficiency of robotic operations.

This curated collection of academic papers delves into groundbreaking research focused on innovative design tools for close-proximity human-robot collaboration. Analyzing these cutting-edge studies reveals the immense potential of robotics technology to enhance efficiency, reduce costs, improve safety, and elevate user experience. The applications of robotics are rapidly expanding, from homecare to precision agriculture, and from construction to medical surgery, making them an indispensable part in daily life. This collection offers robot enthusiasts, professionals, and researchers deeper insights into the applications of cobots, AGVs, and compound mobile robots. It also enables students, scholars, and professors to explore robotics, AI, and algorithms in greater depth, thereby advancing academic and research initiatives. By

providing these insights and research, the company actively fosters collaboration and drives innovation within this industry.

For a complete collection of academic papers, please click on the following link: https://shop.elephantrobotics.com/blogs/news/global-academic-insights-elephant-robotics-unveils-groundbreaking-research-collection-on-cobots-agvs-and-compound-mobile-robots-from-top-universities.

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