TeknTrash Robotics and Sharp Group Launch Humanoid Robot Pilot for Smarter Recycling

LONDON, UNITED KINGDOM, May 7, 2025 /EINPresswire.com/ -- TeknTrash Robotics, a UK-based company pioneering AIpowered robotics and motion intelligence for waste management, has partnered with leading environmental services provider Sharp Group to begin real-world testing of ALPHA—an advanced humanoid robot designed to transform how we sort waste.

Worker capturing movement data at recycling plant to train humanoid robot

Through this, at Sharp Group's state-of-the-art facility in Rainham, East London, where currently they handle and process 2.800 tonnes of waste a week, which includes plastic, paper, glass, metal, general, stone and more - ideal for developing new technology to assist with waste segregation. Frontline workers are now equipped with Meta Quest 3 headsets that record their movements during daily operations. Using an app developed by TeknTrash, Sharp Group workers are capturing detailed motion data—including posture, hand and finger articulation, and synchronised video—to train next-generation AI robotic models.

This data will then be used in ALPHA (Automated Litter Processing Humanoid Assistant), a new class of humanoid robot capable of taking over waste selection tasks that are repetitive, unsanitary, and hazardous.

In fact, the waste and recycling sector is among the most hazardous industries in the UK: in the 2018/19 period, 4.5% of workers in this sector suffered from work-related ill health, a figure notably higher than the all-industry average of 3.1%. Additionally, the rate of non-fatal workplace injuries stood at 3.4%, surpassing the 1.8% average across all industries.

Alarmingly, the sector's fatal injury rate is 17 times higher than the all-industry average, with

seven fatal injuries reported in 2018/19

Also, humans sort waste at an average rate of 30 to 40 picks per minute, but fatigue and decision fatigue lead to errors. Contamination items mixed with recyclables remains a persistent issue, with single-stream recycling (where all recyclables are collected in one bin) resulting in about 25% of material being contaminated, rendering it unsellable. In 2022, England dry recycling declined by 7.1% (0.4 million tonnes), partly due to quality issues affecting resale value.

Robots, by contrast, achieve higher purity rates, reducing bale rejection rates and boosting profitability. And this is where ALPHA plays a role, by working anywhere where waste is being handled: initially picking it up from the conveyor belts in recycling plants, and later carrying garbage cans to the truck, lifting up weights in processing plants, etc. As such, at this stage, ALPHA is being trained to identify waste from conveyor belts at recycling plants, selecting them by material (paper, plastic, etc) and by brand. And, unlike traditional solutions that use robotic arms that are stationary, ALPHA is built for mobility, dexterity, and perception—trained to mirror human hands and precision.

"Our goal is to build a smarter, more sustainable future where waste isn't just managed—it's understood," said Al Costa, CEO at TeknTrash. "We plan to deploy the same solution in 1000 plants all across europe, all connected to the cloud, in order to build a huge dataset of actions related to recycling so we can deploy in ALPHA. Through partnerships like this, we're turning advanced robotics into real-world sustainability impact."

A Smarter, Safer, Scalable Solution

ALPHA is trained using real-time motion data collected from recycling operatives via VR headsets and the data is sent in real time to cloud servers. The data is then processed through IsaacLab and deployed to NVIDIA's GR00T framework for real-time inference. And, by shifting computationally intensive tasks like image recognition and movement planning to a centralised cloud server, the robot can run on lightweight, energy-efficient hardware—extending battery life and improving runtime reliability. Equipped with hyperspectral vision placed at the start of the conveyor belt, ALPHA tracks waste items earlier and more accurately than solutions which use regular RBGD cameras. Finally, unlike suction-based systems, ALPHA's grippers, trained through VR to mirror human hand dexterity, are able to grab more waste and, thus, increase recycling rates.

The humanoid system moves autonomously along rails, coordinates with multiple units, and adapts dynamically to operational conditions. This design solves common problems in traditional waste sorting robotics—lack of flexibility, poor accuracy, and high maintenance—while setting a new standard for industrial humanoid applications.

Real-World Impact, Right Now

"We're thrilled to be working with TeknTrash on such an innovative and forward-thinking project,"

said Chelsea Sharp, Director at Sharp Group. "The integration of AI and robotics into waste management has the potential to completely transform the industry. Not only will this technology
make recycling faster and safer, but it also opens up incredible possibilities for improving transparency and accountability through detailed waste data. We're proud to be part of something that could truly reshape how the world thinks about waste."

A Leading Site for Innovation and Sustainability
Sharp Group operates one of the most technologically advanced recycling facilities in Greater London. The Rainham site offers full-service waste collection, sorting, and recycling operations and is equipped with smart weighing systems, automated handlers, and environmental monitoring tools. Its commitment to innovation and environmental responsibility makes it the ideal testing ground for TeknTrash's robotics.

Through this partnership, data will be captured during the next 6 months, and then, after passing quality metrics, fed into NVIDIA Isaac Lab, a leading robot training platform, to generate a model which will then fed back into an ATLAS humanoid mimicking the same movements.

And this partnership is more than a pilot. The Rainham site serves as a co-development hub where robotic training, AI validation, and system iteration occur in parallel with daily operations. Once testing concludes, Sharp Group will act as the launchpad for ALPHA's broader rollout across the UK and in 1000 plants in Europe in the next 24 months.

The project is also a blueprint for how humanoid robotics and AI can seamlessly integrate into traditional waste workflows to create tangible environmental and operational improvements.

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