Topics

University of Toronto Presents Research Results Based on Joint Research with Konica Minolta at ICRA, an International Robotics Conference

Using Generative AI to Predict Human Motion to Contribute to Safe Robot Control

Tokyo (July 29, 2026) - Konica Minolta, Inc. (Konica Minolta) today announced that a paper incorporating part of research results on human motion prediction technology, which the Company developed with the University of Toronto, Canada, was presented at ICRA 2026, an international robotics conference.

ICRA (International Conference on Robotics and Automation) is a prestigious international conference on robotics. This year, 1,882 papers were chosen out of 4,947 submitted papers. The research results were included in IEEE Robotics and Automation Letters in 2025; subsequently, a program to assist the presentation of papers at relevant international academic conferences was used.

Research Details

Based on its Corporate Plan 2026–2028, Konica Minolta has been working to enhance customer value and improve business productivity by using AI and data. The Company has also been conducting R&D on technologies for increasing business efficiency at manufacturing sites by integrating sensing and AI technologies refined over many years.

For use at plants and logistics facilities, self-driving robots (AMRs and AGVs) need to predict people's moving direction and motion when navigating through crowds and must avoid collisions. However, it is difficult to ensure safety and efficiency based on simple predictions because human–human and human–robot motions affect each other.

In this research, Konica Minolta and University of Toronto developed a technology to predict human trajectories by using a diffusion model, a type of generative AI model. Previously, individual trajectories were predicted separately. The Company's method jointly predicts the trajectory information of multiple individuals at the same time, enabling actual motions to be predicted by factoring in human-human interactions.

In this research, a method to integrate this prediction technology with robot control and optimize human motion predictions and robot path planning simultaneously (SICNav-Diffusion) was also proposed. This helps to create robots

that can move efficiently while ensuring safety by taking human–human and human–robot motions into account.

Adopted Theme

Title	SICNav-Diffusion: Safe and Interactive Crowd Navigation with Diffusion Trajectory Predictions
Researchers	Sepehr Samavi*, Anthony Lem*, Fumiaki Sato** (affiliations at the time of adoption), Sirui Chen*, Qiao Gu*, Keijiro Yano**, Angela P. Schoellig*, Florian Shkurti* *University of Toronto **Konica Minolta, Inc.

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