

# Robot vacuum cleaner conveys seven dwarf personalities by movement alone

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Oregon State University College of Engineering researchers used a vacuum cleaner and the personalities of three of the Seven Dwarfs from Snow White to demonstrate that people can correctly infer a robot's personality solely by how it moves.



Unexpectedly, study participants also discerned intelligence from robot motion behaviors, suggesting people might trust an autonomous system more or less depending on their observations of its movements.

The findings are noteworthy because, much like the importance of personality in people's interactions, robot personality can influence engagement and trust.

The study was published by the Association for Computing Machinery/Institute of Electrical and Electronics Engineering's International Conference on Human-Robot Interaction.

Researchers in the lab of OSU assistant professor of computer science Heather Knight equipped a Neato Botvac vacuum cleaning robot with movement patterns inspired by the personalities of Happy, Sleepy and Grumpy.

Human participants rated the politeness, friendliness and intelligence of each robot motion demonstration after a series of trials that illustrated each of the motion personalities, without being informed of the robot's intended personalities.

"We implemented an expressive autonomous motion generation system that mapped each personality the robots motion features, such as path shape, acceleration and velocity characteristics, and whether they moved toward or away from the participant," Knight said. "The Happy robot sought people out with smooth motions at moderate speed. The Sleepy robot also sought people out, but with delays and slower accelerations. The Grumpy robot avoided people while using erratic motions and a range of velocities. Those simple variations told the people a lot."

True to form, study participants rated Grumpy as the least polite and least friendly, whereas Happy upheld reputation by being rated the



friendliest and smartest. Happy and Sleepy were together deemed most polite, though their rating was just above neutral.

"Participants were able to distinguish the motion-based personas, which bodes well for the integration of robot personality into simple robots" Knight said. "In future work, we hope to extend this work to the other four Dwarfs and study how [personality](#) could positively impact the specific tasks a [robot](#) is taking on around people."

Provided by Oregon State University

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