# Altering a robot's gender and social roles may be a screen change away 

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Robots can keep their parts and still change their gender, according to Penn State researchers, who noted that the arrival of robots with screens has made it easier to assign distinct personalities.

In a study, people found that feminine cues on the robot's screen were
enough to convince them that a robot was female, said Eun Hwa Jung, a doctoral student in mass communications. The findings may help robot developers economically customize robots for certain roles and to serve certain populations.
"We changed the gender cues-male or female-on two different locations: the robot body and the robot's screen," said Jung. "The screen, by itself, helped participants perceive whether the robot was male or female."

Robot makers may not need to alter the robot's shape or features to meet users' expectations and preferences, said S. Shyam Sundar, Distinguished Professor of Communications and co-director of the Media Effects Research Laboratory, who worked with Jung.
"There is research in our field that suggests we treat computers as other human beings, and with robots being more anthropomorphic, we have a tendency to treat them in more human-like ways, but having this fixed morphology curtails us from giving the robot much of a personality," said Sundar. "Screen-based changes give us the ability to constantly change the robot's personality."

The researchers, who present their findings at the ACM Conference on Human Factors in Computing Systems today (May 11), found that participants assumed a robot without any gender cues was male. Participants also found male robots were more human-like, more animated and less anxious.
"The default assumption, at least based on our results, is that robots are typically perceived as male," said T. Franklin Waddell, who recently earned his doctorate in mass communications and worked with Jung and Sundar. "One of the big challenges, then, is, how can we change the perceived gender of robots for people who prefer to interact with a
female robot without changing the actual body of the machine? Our results show that changes to the screen of the robot are one promising possibility."

The screen could also convey other attributes.
"Gender is just one example that we tested here, but we see implications for other role definitions that we can potentially outfit a robot with by just manipulating a screen," said Sundar.

For example, the screen could be used to customize occupational and social roles, such as bank teller, judge, or a psychiatrist.
"You could also modify race, ethnicity and age, as well as other demographic characteristics," said Jung.

The researchers tested six different robot conditions on 144 participants.
Two robots had external gender cues-a men's hat on the male robot and a pink earmuff on the female robot. To test the effect of the screens, the researchers showed participants a robot with a screen face including a men's hat for one condition and a face with pink earmuffs for the other. Another robot had female cues on both its body and screen. A robot with no gender cues served as the control.

Jung said the robot with female cues on both body and screen elicited the strongest perception of robot femininity among the participants.

Participants used a smartphone application to interact with the robot. The robot first moved toward and greeted the participant. After the greeting was returned, the robot asked the participants if they would like to hear music, and played two 30 -second song clips. Participants gave their opinion of the song and the robot returned to its regular location.

# Because voices are another gender cue, the researchers used the same gender-neutral voice for all conditions. 

## Provided by Pennsylvania State University

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