

Researchers are teaching robots to respond to touch

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PRESS RELEASE FOR IMMEDIATE RELEASE

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By teaching robots how to show personality and emotion through touch and other senses, a group of researchers from Université Paris-Saclay (<https://www.universite-paris-saclay.fr/en>) are being recognized pioneers in robotics.

Research conducted by Professor Adriana Tapus from ENSTA ParisTech, Université Paris-Saclay, aims to develop a humanoid robot sensitive to tactile stimulation. The Heroes Project – in collaboration with Dr. Moustapha Hafez from CEA Paris-Saclay, Prof. Mehdi Ammi from LIMSI, and PhD student Pierre-Henri Orefice – addresses interaction via touch.

First results show that a robot is capable of inferring someone's gender and personality in 75% of cases simply by shaking hands.

"Giving robots a personality is the only way our relationship with artificial intelligence will survive. If we can simulate a human like emotional response from a robot we can ensure a two-way relationship, benefiting the most vulnerable and isolated members of our society. Our research will help the next generation of social robots to be polite, empathetic, and maybe have their own sense of humour", says Prof. Adriana Tapus.

In addition to an anthropomorphic appearance, robots must also develop social interaction strategies to be better integrated in human centred environments. The ENSTA research team have developed robots to elicit different emotions and dominance depending on the situation and context. This includes, for example, adapting the arm stiffness and amplitude in a hand shaking interaction.

Prof. Tapus' research group at ENSTA have also studied emotion recognition. This was mainly part of a project designed for people suffering with Autistic Syndrome Disorder (ASD).

It is well-known that individuals suffering ASD have difficulty in recognizing and understanding social stimuli. However, past research shows they have affinity in interacting with robots. So Prof. Tapus' research group, with Prof. Jean-Claude Martin from LIMSI and Prof. Brice Isableu from CIAMS, investigated the recognition of emotions by those suffering ASD with various embodiments, from real humans to robots and human avatars. This work was done in collaboration with three centres working with individuals with ASD; MAIA Autisme and IME Notre Ecole – two associations for children and adolescents with ASD – and FAM-La Lendemain, a residence for young adults with ASD.

These potential new therapies could help autism sufferers become more social. This work on autism and robots was part of Pauline Chevalier's PhD thesis.

This work also means that robots have the potential to become carers for our ageing population, work with humans to complete complex tasks and intervene in situations where human contact is welcome. This was

only previously seen possible in Science Fiction.

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