

Yale leads \$10 million effort to build social robots

Yale UniversityYale University

A Yale-led research team will spend the next five years developing a new breed of sophisticated socially assistive robots for helping young children learn to read, appreciate physical fitness, overcome cognitive disabilities, and perform physical exercises.

The purpose of the \$10 million, federally funded effort, announced April 3, is to create self-adapting machines capable of cultivating long-term interpersonal relationships and assisting pre-school-age children with educational and therapeutic goals.

The big idea is that we're building robots to help kids, said Brian Scassellati, the Yale computer scientist who is leading the intensive, multi-university project. At the end of five years we'd like to have robots that can guide a child toward long-term educational goals, be customized for the particular needs of that child, and basically grow and develop with the child. We want the robot to be the equivalent of a good personal trainer.

The robots would supplement, not replace, human teachers and caregivers, Scassellati said, and would work both with regularly developing children and those with social or cognitive deficits. What many children really need is individualized attention every day for periods of weeks, months, or years, he said.

The interrelated technical, social and pedagogical challenges are daunting. The scientists will attempt to model the dynamic nature of social interaction and develop novel algorithms that endow the robots with a vast array of behavioral options.

Currently there are many robots that learn single skills under controlled laboratory settings. But Scassellati and his team will attempt to create complex robots that readily adapt to the changing needs, abilities, interests and idiosyncrasies of individual children. We want to build a healthy relationship of trust and respect between the child and the robot so that the child will work hard to achieve the goals set by a teacher or clinician.

Ideally, the robots will be able to successfully engage children for up to a year, Scassellati said. You stop listening to the guy that tells the same joke every day, he said. A child does the same thing with a robot that never changes.

In all, the team involves 17 principal investigators from four universities Yale, Stanford, MIT and the University of Southern California. The researchers represent a diverse group of intellectual disciplines, including computer science, robotics, educational theory, and developmental psychology.

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The foundation for this unusual and important project was laid by the Scassellati groups remarkable research demonstrating the effectiveness of using robots to help autistic children develop social skills, said Steven Girvin, Yales deputy provost for science and technology.

Other Yale researchers on the team include John Morrell and Aaron Dollar of mechanical engineering, and Fred Volkmar and Rhea Paul of the Yale Child Study Center.

The National Science Foundation is supporting the research though its Expeditions in Computing program. The \$10 million grant is one of the largest awards that the agency makes.

Eric Gershon

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