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Brown / Hasbro team to design smart robotic companions to assist seniors

A \$1 million grant from the National Science Foundation will fund a three-year partnership that seeks to enhance Hasbro's Joy for All Companion Pets into smart robots that can help older adults with everyday tasks.

PROVIDENCE, R.I. [Brown University] — A group of academic researchers, led by cognitive and computer scientists from Brown University, is teaming up with a cross-functional team from global play and entertainment leader Hasbro to design a smart robotic companion capable of assisting older people with simple but sometimes challenging tasks of everyday living.

The project, dubbed ARIES (Affordable Robotic Intelligence for Elderly Support), will add artificial intelligence capabilities to Hasbro's current Joy for All Companion Pets — animatronic dogs and cats designed to provide interactive companionship, comfort and joy for older adults. The research team's goal is to develop additional capabilities for the ARIES companions to help older adults with simple tasks that could include help in finding lost objects, medication reminders or other tasks that sometimes become challenging, especially those who may have mild dementia.

The work is supported by a \$1 million grant from the National Science Foundation and will be led by Brown's Humanity-Centered Robotics Initiative (HCRI), a group of computer and social science researchers who explore the societal opportunities and challenges presented by robotics. The academic project team also includes researchers from Brown's Warren Alpert Medical School, Butler and Bradley hospitals in Providence, R.I., and the University of Cincinnati.

"Hasbro did a great job developing a product that can provide comfort and joy for older people," said Bertram Malle, a professor in Brown's Department of Cognitive, Linguistic and Psychological Sciences, co-director of HCRI and the principal investigator on the grant. "What we want to do now is leverage our expertise in cognitive and computer science to add capabilities to this robotic pet. Neither of us could do this on our own, but together we have the expertise to potentially develop something truly beneficial."

Over the next three years, the group plans to perform a variety of user studies to understand how ARIES might best assist older adults. Then they'll work on developing and integrating a variety of artificial intelligence technologies that will meet the needs identified in the user studies. These could include sensor systems that allow the ARIES companion to identify and keep track of important objects around the house, such as keys or eyeglasses, help the person remember important tasks and events, and enhance safety.

The team will also study means of effective communication between the ARIES companion and users.

"The Joy for All Companion Pets currently make some realistic pet sounds and gestures," Malle said. "We may want to expand those capacities and add intelligence to them, so the companions give meaningful clues —

gestures, nudges, purrs — that help to guide users toward misplaced objects or let them know that it's time to do something.”

The early user studies will play a key role in how the project unfolds, Malle says.

“There are some things — like locating objects and taking medications — that we know from the literature people find useful,” he said. “But in our first year we want to find out what other challenges people face that we don't know about, and then see if we can develop technologies to address them.”

One critical factor the researchers will keep in mind is cost.

“The ‘A’ in ARIES stands for ‘affordable,’ and that's something we're taking very seriously,” said Michael Littman, a professor of computer science at Brown and co-principal investigator on the grant. “This is one of the important reasons Hasbro is a great industry partner for this project. The current Joy for All pets cost roughly \$100 while similar robotic products can cost \$5,000 to \$6,000. We want the ARIES robot to be available to anyone who needs it.”

Ultimately, the team hopes to complete a prototype and test it with target users by the end of the three project years. The researchers stress that they don't intend this to be a technology that can take the place of human caregivers. They hope instead that it can complement the work of caregivers and help in a small way to meet the challenge presented by an aging population.

“To us, this project really represents what we do at HCRI, which is to let societal needs drive technology development,” Malle said. “We know that caring for an aging population will be a tremendous challenge in the coming years, and we think technologies like ARIES could play a small but potentially important role in helping people meet that challenge.”

Ted Fischer, vice president for business development at Hasbro, says the company has been excited by the response to its Joy for All line.

“Social isolation and loneliness are growing issues for older adults and our companion pets make people smile, Fischer said. “Hasbro's expertise in play and engaging experiences in collaboration with leading scientists from Brown's HCRI is a powerful combination to explore additional impactful uses for ARIES companions.”

The research team will include Peter Haas, associate director of HCRI; HCRI postdoctoral researchers Maartje de Graaf and Elizabeth Philips; Michael Armey from Butler Hospital and Brown's Warren Alpert Medical School; Gary Epstein-Lubow from Butler, Brown and Hebrew Senior Life; Claudia Rébola, an industrial design professor at the University of Cincinnati; Ron Seifer of Bradley Hospital; and a multidisciplinary team from Hasbro including designers, engineers and marketing professionals.