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A COMMUNICATIVE ROBOT TO LEARN ABOUT US AND THE WORLD

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We describe a model for a robot that learns about the world and her companions through natural language communication. The model supports open-domain learning, where the robot has a drive to learn about new concepts, new friends, and new properties of friends and concept instances. The robot tries to fill gaps, resolve uncertainties and resolve conflicts. The absorbed knowledge consists of everything people tell her, the situations and objects she perceives and whatever she finds on the web. The results of her interactions and perceptions are kept in an RDF triple store to enable reasoning over her knowledge and experiences. The robot uses a theory of mind to keep track of who said what, when and where. Accumulating knowledge results in complex states to which the robot needs to respond. In this paper, we look into two specific aspects of such complex knowledge states: 1) reflecting on the status of the knowledge acquired through a new notion of thoughts and 2) defining the context during which knowledge is acquired. Thoughts form the basis for drives on which the robot communicates. We capture episodic contexts to keep instances of objects apart across different locations, which results in differentiating the acquired knowledge over specific encounters. Both aspects make the communication more dynamic and result in more initiatives by the robot.

Keywords: multimodal communication, social robots, knowledge acquisition and modeling