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Techniques to Enable and Communicate Robot Intended Expressions

Researchers at the University of South Florida have developed systems that easily communicate robot short and long term intentions (e.g., planned movements) to people within close proximity.

There has been tremendous advancements in the field of robotics. Robots are now commonly employed to carry out complex tasks that may be tedious, difficult and/or dangerous for humans to perform. Recent research and design efforts have focused on leveraging robot strengths, such as precision and efficiency, with human strengths, such as cognition and intelligence, and integrating robots in to human living and working environments. The ultimate goal is to enable robots to perform tasks safely and reliably in close proximity to humans.

Inventors at USF have developed a novel framework that enables robots to communicate a set of short and long term future intentions in a quick, simple, and human-digestible manner. The framework provides users with real-time information regarding a robot's planned actions and enables people and robots to make collaborative decisions and act synergistically. The invention includes an intention generator that derives a set of possible intentions for a robot based on a task and the robot's kinetic and dynamic models associated with the task. In addition, an intention interaction component enables humans to influence the robot's intentions before the robot executes a planned action. This invention can be used in any area where it will be beneficial for people and robots to work side-by-side including manufacturing, agriculture, healthcare, military and service industries.

ADVANTAGES:

- **Increases efficiency of people and robots operating in shared space**
- **Reduces risk of damage to robots**
- **Increases safety for humans**
- **Provides real-time adjustment of planned robot actions**

Simple & Efficient Communication of Robot Intentions

Mobile Robot With Intention Displayed on Monitor (Left) and Intention Displayed on Floor (Right)

Tech ID # 11B180 **Patent #: 9,744,672**

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