Fall 2015 Student Projects
Autonomous Systems Lab
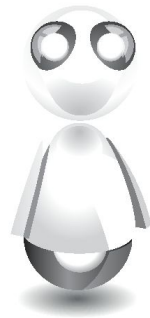

The Verifiable Robotics Research Group (www.verifiablerobotics.com) is part of Cornell's Autonomous Systems Lab (www.cornell-asl.org) and is lead by Prof. Hadas Kress-Gazit. This Fall, we are looking for one student for each of the three projects below. If you are interested, please apply as follows:

- Send an email with the subject line "[ASL Fall 2015 Project] Your First and Last Name" to the corresponding PhD student (see info after each project)
  - If you are interested in more than one project, please send a single email, but with multiple recipients.
  - In any case, please CC Prof. Kress-Gazit (hadaskg@cornell.edu)
  - In the email, include your résumé, your up-to-date transcript (unofficial is OK), and a short cover letter.
- We will then contact you to set up a short informal interview.

User Interface for High-Level Tasks
Carried out with Dynamic Robots
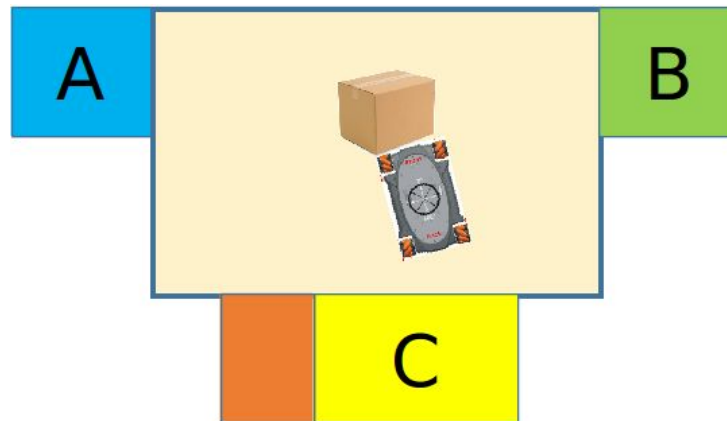
Consider a task of automatically assembling (or organizing) a set of items placed in front of a robot, where the user is allowed to direct exactly where to place the items and the robot takes care of the rest. We have developed techniques to automatically generate controllers from high-level specifications of tasks, with the ability to inform the user as to the conditions (rules) that he/she must adhere to when interacting with the robot. For example, the user can't unfairly direct the robot to turn back the way it came once it is already approaching a corner while pushing a box. We want to explain such "rules" to the user in the clearest possible way.

The goal of this project is to devise a *user interface* for interacting with humans at runtime. This involves: (a) a means for **inputting** the user's intent (i.e. where to place any given item) at runtime and (b) a means for **explaining** to the user any limitations on his/her behaviors (where the user can no longer change their mind), both offline and at runtime. We have use of a KUKA youBot for this task, and intend to integrate the user interface into a complete demo by semester's end.

Credits: 4   Contact: Jon DeCastro (jad455)