

# Preface

Many undergraduate educators have embraced autonomous robots over the past decade. In tandem, the number and popularity of robot-themed exhibitions and competitions has surged. These venues spark interest in AI, motivate class or research projects, and invite students into communities that extend beyond the walls of their particular institution. Yet obstacles to participation can be substantial: they include robots' time-and-money costs, curricular constraints, and the competitiveness underlying some robotic venues. This set of symposium papers investigates the undergraduate educational space involving autonomous robots, with an eye toward optimizing robots' and robot venues' effectiveness under the constraints all educators face.

This technical report features work by hardware designers, software- and curriculum-writers, interested educators, and robot contest or exhibition organizers. From the broad set of contributions four themes have emerged:

*Robots in the AI Curriculum: Examples and Issues:* These papers provide classroom-tested curricula and curricular themes that illustrate how educators have maximized the motivation and impact of robots and robot venues for their students while minimizing or mitigating costs in time, organization, money, and overhead. The contributions span undergraduate education from first-year CS and liberal arts courses to advanced electives in AI or robotics per se.

*Emerging Robotic Platforms for Education:* Though it is still January as of this writing, the year 2007 has already seen some remarkable innovations in the robotics resources available to educators. This set of papers introduces several new platforms, as well as new looks at some traditional educational robots. As a whole, this body of work demonstrates the promising extent to which the barriers to using robots in AI and CS have diminished in the recent past.

*Leveraging Robot Competitions and Exhibitions:* These authors are considering the question, "What makes robot competitions and exhibitions inviting, worthwhile, and feasible?" With the publicity of the DARPA grand challenge and the growing popularity of high-school robotics competitions like FIRST and Botball, undergraduate educators are finding their students increasingly enthusiastic for opportunities to jump into the fray. These papers explore the gamut from successful and sanity-preserving local contests to larger venues that can inspire students to venture outside their school's walls to exhibit and publish their work.

*Building Community via Robotics:* Within CS, across disciplines, and broader outreach these contributions provide exemplars of collaborative uses of robotics that push beyond its usual position as an advanced engineering or computational course offering. Approaches include introducing robotics early in the curriculum, using robotics as a resource for educational outreach, developing programs in regions where access to support technology is less certain, and reaching across disciplinary boundaries such as, for example, to art and philosophy.

In a sense, this fourth theme recaps the symposium’s overarching goal: building community through robotics. By lowering barriers to robot use via hardware, software, curriculum, and a spectrum of accessible venues for students’ work, we hope that this symposium helps make robotics an accessible, community-building, and energizing facet of many students’ undergraduate experiences.

*Douglas Blank, Zachary Dodds, Paul Rybski,  
Jerry Weinberg, and Holly Yanco*