Ground and Field Robotics

(rapporteur: Brian Randell)

- Three talks
  1. Ashley Tews (Australia), Towards Long-term Reliable Field Robot Operations
  2. Larry Jackel (USA), Autonomous Navigation of Ground Robots
  3. Xavier Défago (Japan), A Look at Dependability and Synchrony in Distributed Mobile Robotic Systems: Adding Some Pragmatism to Theory
- Provided very different perspectives
  1. Safety engineering applied to practical industrial robots
  2. Competitions aimed at encouraging progress in AI-style approaches to navigation in unstructured environments
  3. Distributed system theory meets robotics

Ashley Tew's talk

- Illustrated by numerous videos, e.g.
  - autonomous mine transports (à la Indiana Jones)
  - explosive placement (in pre-drilled holes)
  - use of cable array robot to simulate flight
  - UAV monitoring of Great Barrier Reef
  - etc.
- For each robot, summarized the very varied dependability requirements and approaches

Larry Jackel's talk

- Autonomous navigation of ground robot in unstructured environments (such environments being the principal cause of failures)
- Problems:
  - near-sighted sensors
  - lack of commonsense
  - inaccurate location determination
  - scene understanding
- Described & showed videos of a series of competitive challenges, entered by a number of robot-building teams
- The competition stimulated considerable progress, e.g., in design of machine learning navigation, planning software…

  (underlying theory develop-ments were involved)

Xavier Défago's talk

- The challenge: build a system from multiple robots
- The aim: a deterministic solution, with little or no infrastructure, and very weak assumptions
- The hope: to move from theory to practice
- Summarized past results, described solutions, and some impossibility results
- The talk's subtitle was "adding some pragmatism to theory
- This pragmatism was deferred to a research report!

Summary

- 3 individually interesting presentations
- even more interesting as a heterogeneous set
- nice comment (by DP):
  - goal seeking and (forward) error recovery are essentially the same topic