Getting Computer Systems to Function as Team Players (Abstract)

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As a result of the ubiquity of computer networks, computer systems are increasingly acting as elements in a complex, distributed community of people and systems, rather than operating as solitary devices employed by a single person. Individuals in such communities may interact in various ways—competing, coordinating, collaborating. This talk will focus on those multi-agent scenarios and applications in which groups of agents work together to accomplish a joint activity or to achieve a common goal, that is, on situations in which agents collaborate. Many applications require such collaborative endeavors, and a major challenge for computer science is to determine ways to construct computer systems that are able to act effectively as collaborative team members.

Teams may consist solely of computer agents, but often include both systems and people. Teams may persist over long periods of time (as do orchestras, sports teams, and systems administration groups), form spontaneously for a single group activity (as when a group forms for a programming project or to provide aid after a natural disaster), or come together repeatedly (as do surgical teams and airline crews). Team members must form commitments not only to the group action itself, but also to the activities of other participants that are in service of this group activity. Group decision-making processes are required to expand partial plans to more complete ones.

In this talk, I will briefly review the major features of one model of collaborative planning, SharedPlans [GroszKra96,GroszKra99] and will describe efforts to develop collaborative planning agents and systems for human-computer communication based on this model. The model provides a framework in which to raise and address fundamental questions about collaboration and the construction of collaboration-capable agents. I will discuss recent approaches to three plan management processes—assessment of alternatives, commitment management, and group decision-making for recipe selection and task allocation—and will raise several challenges for future research.

References

GroszKra96. Barbara J. Grosz and Sarit Kraus: Collaborative Plans for Complex Group Action. Artificial Intelligence. **86:2** (1996), 269–357.
GroszKra99. Barbara J. Grosz and Sarit Kraus: The Evolution of Shared Plans. Foundations of Rational Agency, eds. A. Rao and M. Wooldridge, Kluwer Academic Press. (1999) 227-262.