



## Multi-Agent Contracting for Tasks with Temporal and Precedence Constraints

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402 Digital Technology Center in the Walter Library starting at 3:30 p.m. with an informal discussion to follow

### **Abstract:**

Many business-to-business transactions require contracts for delivering or manufacturing goods over different periods of time and with different deadlines. Current electronic marketplaces are mostly limited to auctions and do not have any notion of time and scheduling constraints. We introduce the University of Minnesota MAGNET (Multi-Agent Negotiation testbed) system. MAGNET makes effective use of a distributed community of self-interested agents with limited rationality, each representing a business entity or a decision-maker. MAGNET agents participate in first-price, sealed-bid combinatorial auctions over collections of tasks with precedence relations and time constraints. In any negotiation session, one agent plays the role of a customer, which, in order to fulfill its goals, must contract with other supplier agents for all or part of the necessary tasks. Supplier agents providing resources or services attempt to gain the greatest possible benefit, and customer agents requesting resources or services will attempt to pay the lowest price. We will describe how an agent can maximize its profits while predicting and managing its financial risk exposure when requesting quotations for bids and when awarding bids. We show how this can be done by specifying appropriate time windows for tasks when soliciting bids, and by selecting effectively the winning bids.

### **Biography:**

Maria Gini is a Professor in the Department of Computer Science and Engineering at the University of Minnesota. Before joining the University of Minnesota she has been a Research Associate at the Politecnico of Milan, Italy, and a Visiting Research Associate at Stanford University. Her research interests are in using Artificial Intelligence to create autonomous entities, such as robots and intelligent software agents. Her major contributions include negotiation for software agents, planning with incomplete information, robot motion planning, and coordination of multiple robots. She has co-authored over 100 technical papers. She is on the editorial board of the journals "Autonomous Robots" and "Integrated Computer-Aided Engineering." She was the General Chair for the 1st International Conference on Autonomous Agents and Multi-Agent Systems 2002 and for the 7th International Conference on Intelligent Autonomous Systems 2002.

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