Preface

Five years ago, the symposium entitled "Reasoning with Diagrammatic Representations" was presented as one of the AAAI 1992 Spring Symposium Series. This symposium met with great success, generating over a hundred high quality submissions from a wide spectrum of disciplines including psychology, philosophy, cognitive science, and artificial intelligence. In its wake, a number of books and articles concerned with diagrammatic representations and reasoning have been published (e.g. *Diagrammatic Reasoning: Cognitive and Computational Perspectives*, Glasgow, Narayanan, & Chandrasekaran. MIT Press), a diagrams mailing list (diagrams@csli.stanford.edu) and web site (http://uhavax.hartford.edu/diagrams) have been initiated, and many research sites have turned their attention toward diagrammatic reasoning issues.

This should come as no surprise given the pervasiveness of diagrammatic representations and reasoning (DR) in all human endeavor. DR is at least as important today as it was when investigated by the first symposium. Understanding and modeling the facility that human beings have in the domain of DR could be of great benefit, for instance, in terms of computational efficiency through explicit representation, improved human-machine interfacing, and the development of an artificially intelligent agent that interacts with its environment as fluently as a naturally intelligent agent now does.

The explosion of graphical and visual information has made research in DR even more important five years after its first symposium. The complete dominance of graphical user interfaces, the burgeoning of visual languages, the rapid growth of geographic and molecular structure databases, and the massive graphical content of the World Wide Web exemplify the urgency of this research. Herbert Simon, in the forward to "Diagrammatic Reasoning: Cognitive and Computational Perspectives", states "In a society that is preoccupied with 'Information Superhighways', a deep understanding of diagrammatic reasoning will be essential to keep the traffic moving on those highways, and even more, to give us tools to help cope with, and even make constructive use of, the mass of information that we now know how to generate." We intend the current symposium to be a step towards that deep understanding.

We define diagrammatic representations as those that analogically model the semantics of a problem domain and diagrammatic reasoning as the process by which we make inferences from such representations. We believe the following broad issues are central to DR:
* Cognitive theories of imagery and imaginal reasoning
* Formal theories of DR
* Computational models of DR
* Synergy between cognitive theories, formal theories, and computational models of DR
* Application of DR in AI, logic, human-machine interfacing, visual languages, etc.

It is our hope that those in attendance of the current symposium will refine these issues and identify others, broadening the base of research concerned with DR while simultaneously sharpening the focus of such research.

Michael Anderson