

## **A Multi-Agent System for Predicting Future Event Outcomes.**

Janyl Jumadinova  
College of Information Science & Technology  
University of Nebraska at Omaha  
6001 Dodge Street, Omaha NE 68182  
[jjumadinova@unomaha.edu](mailto:jjumadinova@unomaha.edu)  
(402) 554 - 6043

Prithviraj Dasgupta  
Computer Science Department  
College of Information Science & Technology  
University of Nebraska at Omaha  
6001 Dodge Street, Omaha NE 68182  
[pdasgupta@unomaha.edu](mailto:pdasgupta@unomaha.edu)  
(402) 554 - 4966

### **Abstract (200 words)**

Our research focuses on understanding and analyzing prediction markets using multi-agent system and game theory-based tools. Our research attempts to address some of the shortcomings in the state-of-the-art techniques used in prediction markets. First, we develop a multi-agent system that relaxes some of the limiting assumptions made by the existing models on the behavior of the market's participants and uses new parameters to capture pragmatic and important market features such as the availability and impact of information about events in the market. To verify the correct performance of our agent-based prediction market, we have performed rigorous experiments and compared it with other prediction market models and trading strategies. Our results show that our agent-based prediction market provides a better understanding and novel insights into the behavior of prediction markets and its participants. Secondly, we develop a game-theory based system that formalizes the strategic behavior and decision making by the prediction market's participants. Our system can concisely describe the behavior of the prediction market's participants and the impact of that behavior on the market's prediction outcome. We have compared five existing trading strategies with our equilibrium strategy and found that the market's participants following our suggested equilibrium strategy achieve higher profit.