Experiments with auctions

- Auctions are relatively simple and well-defined economic environments. They provide a valuable testing-ground for economic theory.
- Electronic implementation of auctions makes data collection and analysis easier.
- Experiments can be performed either in laboratories or in fields with either human objects, software agents or their mixture.
- A number of software system for auction experiments are available.
- A number of specific competitions were designed for experimental research on auctions.

Trading Agent Competition (TAC)

"Trading agents are autonomous software programs designed to trade in electronic markets." (http://tradingagents.org)

"The Trading Agent Competition is an international forum designed to promote and encourage high quality research into the trading agent problem." (http://www.sics.se/tac/)
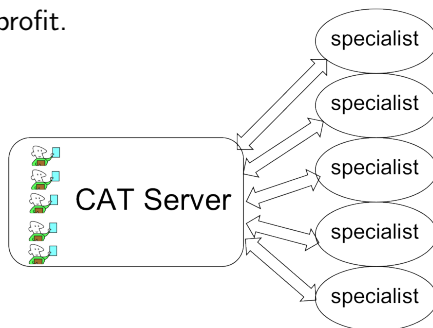
TAC Games

- TAC Classic: 2002-2006
- TAC Supply Chain Management (SCM): 2003-2012
- TAC Market Design: 2007-2011
- TAC Ad Auctions: 2009-2012

TAC Market Design Game (CAT Tournament)

The TAC Market Design Game simulates competition between financial markets in double auctions. Each participated agent, called *a specialist*, represents a market maker who runs a double auction market for traders to sell and buy goods. A specialist wins a game if

- it owns more marketshare;
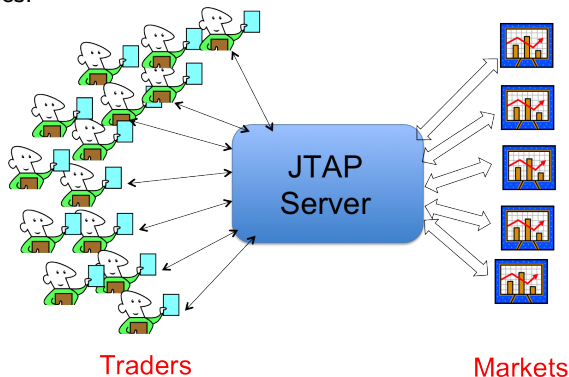- it has higher transaction rate;
- it earns more profit.
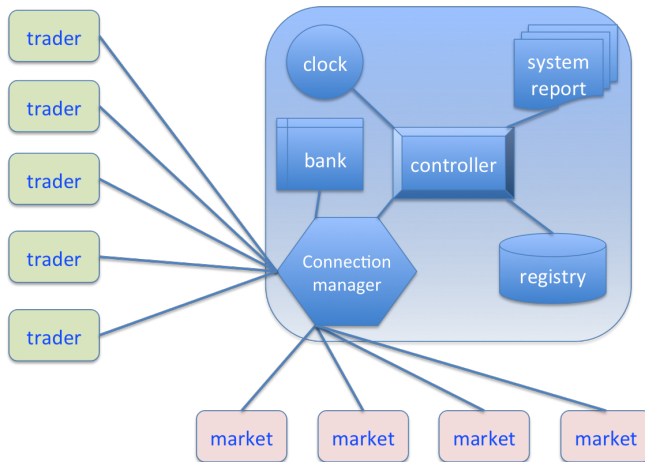
Market Design Game: Issues

- Market mechanisms are limited to double auctions.
- Competition is limited to market makers. Traders are simulated.
- Simulation results heavily rely on traders' behaviour, which is limited to a number of specific bidding and market selection strategies .
- Far from the real world.

Jackaroo Trading Agent Platform

Jackaroo Trading Agent Platform (JTAP) is a multi-agent system that allows a number of autonomous trading agents to trade with different market facilities.
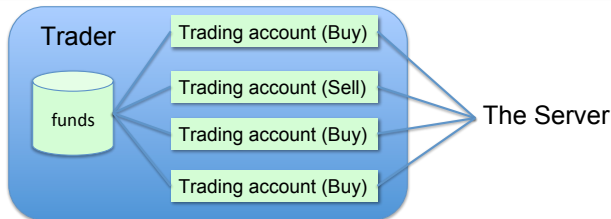

Traders   JTAP Server   Markets

JTAP Server

The platform adopted the client-server structure, socket-based communication and plain-text message language.

JTAP markets

- Each market runs under a market mechanism for single good trading (homogenous units).
- A market may
  - accept or reject shouts/bids from traders
  - match shouts or select winners
  - provide daily trading information
  - charge service fees
- Example of implemented markets: *English auction, dutch auction, combinatorial auction, double auction, labor market, simulated stock market and options market.*

JTAP Traders

- Each trader consists of a number of trading accounts.
- Each trading account can either be a selling account or buying account for a single good.
- Each trading account is endowed with a trading strategy, determining when to make a shout and its price.
- The trader determines with goods to buy or sell.

Application of JTAP: Market simulation

Use JTAP as a flexible simulation system to test variety of market mechanisms, traders' strategies and their relationship:

- Implement specific markets with given market rules.
- Implement trading agents (traders) with designed strategies.
- Observe the relationship between trading strategies and market behaviour.

Current work focuses on investment strategies in financial markets, labor markets to test market movement, and repeated English auction with budge limit.

Application of JTAP: Strategic Trader Game

Strategic Trading Game is a game designed for promoting design and analysis of trading strategies for software traders trading in financial markets.

Game Scinario

- The game simulates a number of financial products for traders to trade with. The types of products include: stock exchange, ETFs (exchange-traded fund) and options.
- Each entrant is given a fictitious budget to invest with the financial products.
- Each entrant operates a numbers of trading accounts, each of them is either a buying account or selling account, to balance investments.
- Entrants' performance is judged by their earning.
- The First Australian Open will be run in December during the 25th Australasian Joint Conference on Artificial Intelligence (AI'12).

JTAP and Strategic Trading Game

For more information about Jackaroo Trading Agent Platform and the Strategic Trading Game, please visit:

http://www.jackaroomarket.org

For more information about AI'12, please visit:

http://ai12.org