

Analytics with Strategic Users

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Computer Science
and Automation

Computer Science and Automation
Indian Institute of Science, Bangalore



Thanks to Collaborators



**Optimal Auctions for Direct
Procurement**



**Combinatorial Auctions for Indirect
Materials Procurement**



**Algorithms for
Carbon Trading**

xerox



**Incentive Compatible
Machine Learning**



**Mechanism Design
For Services**



A Mechanism Design Problem

**Mother
Social Planner
Mechanism Designer**



**Kid 1
Rational and
Intelligent**

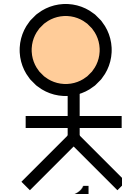


**Kid 2
Rational and
Intelligent**

A Familiar Game

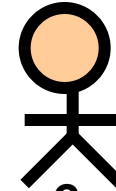


Sachin Tendulkar



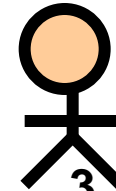
1

**Mumbai
Indians**



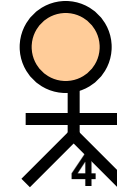
2

**Kolkata
Knight Riders**



3

**Bangalore
RoyalChallengers**



4

Punjab Lions

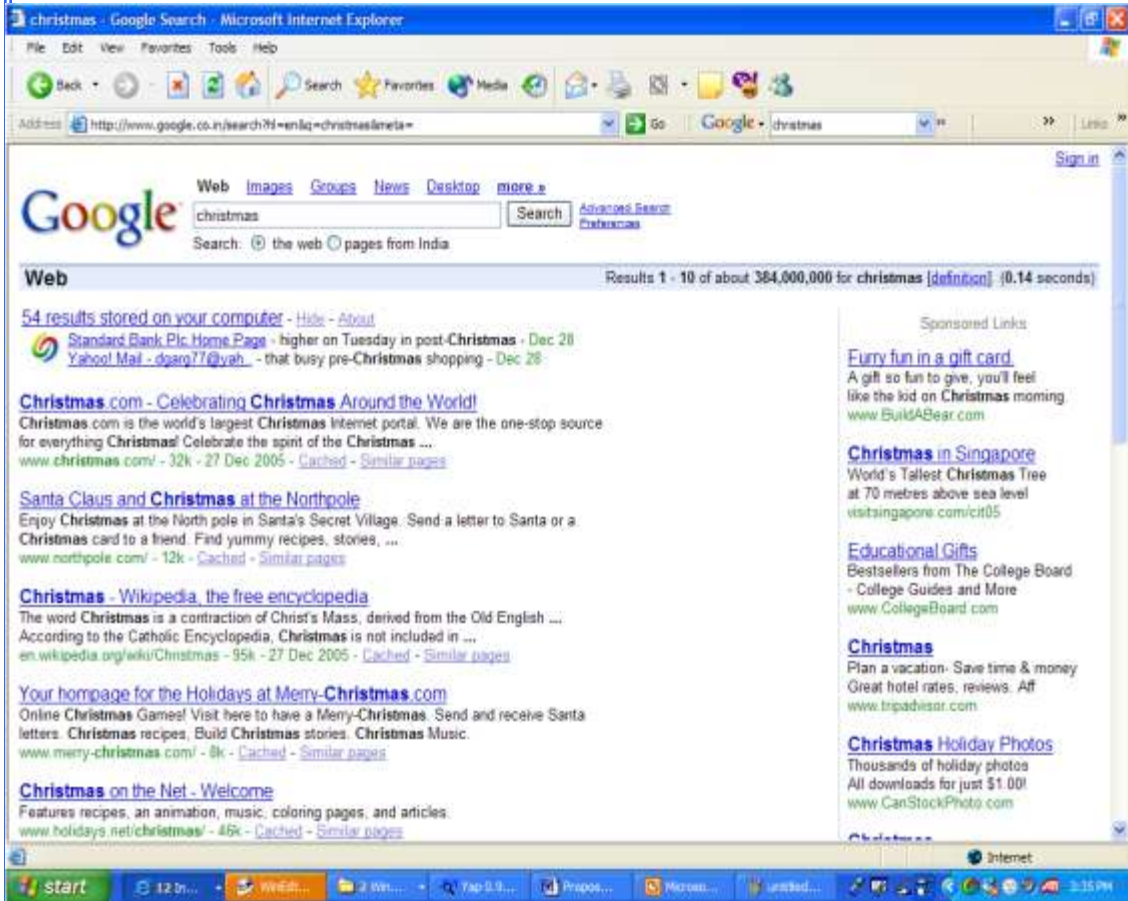
IPL Franchisees

IPL CRICKET AUCTION



Sponsored Search Auction

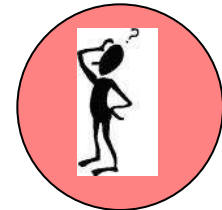
Advertisers



θ_1



θ_2



θ_n

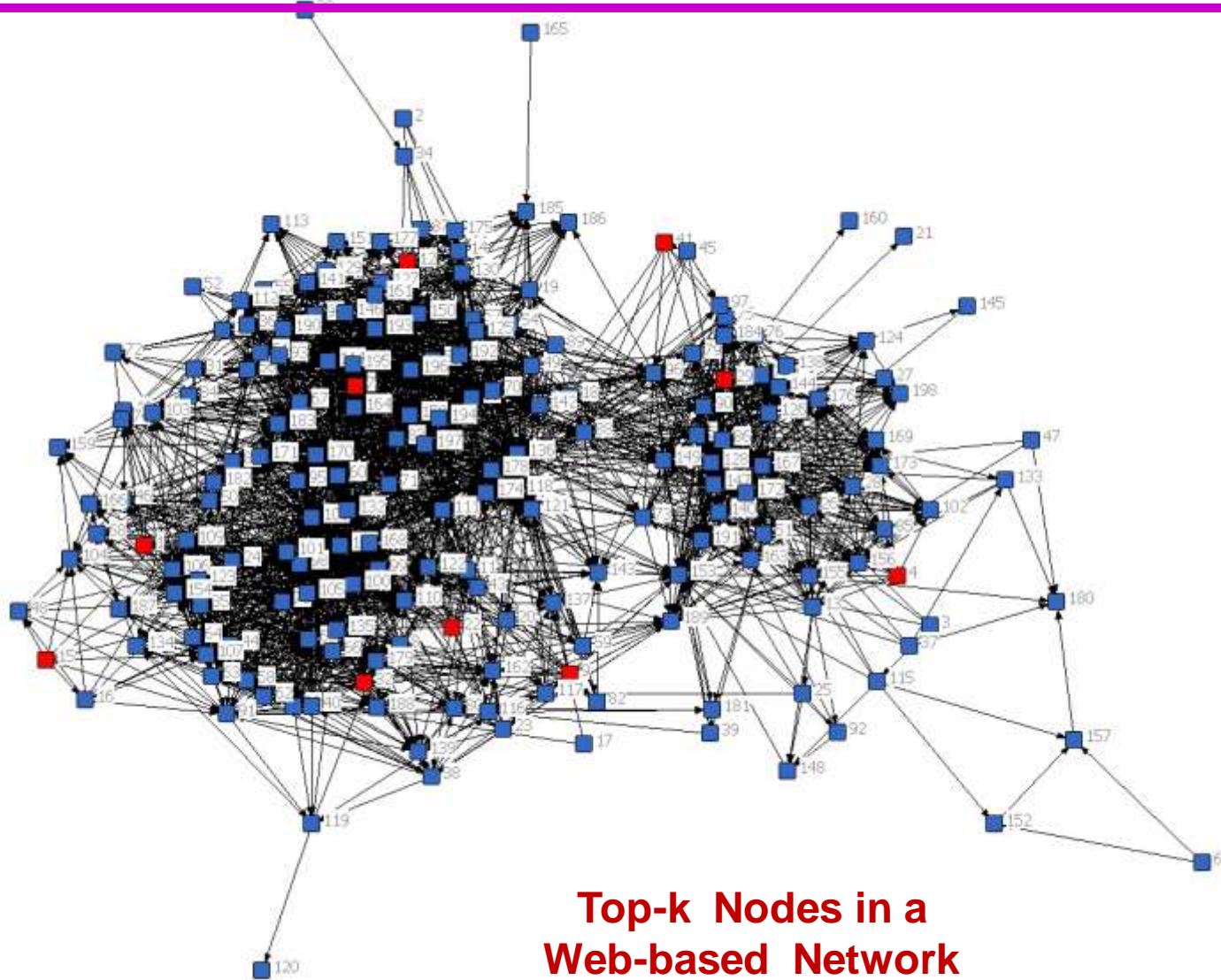


CPC

Major money spinner for all search engines and web portals

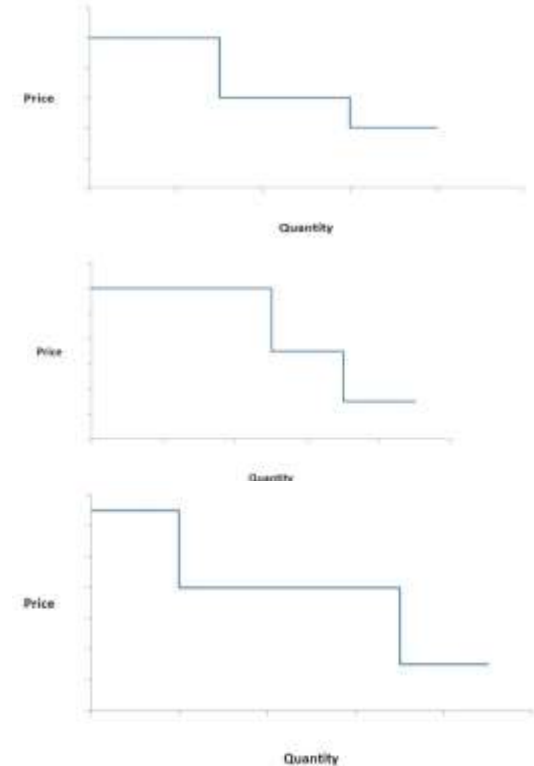
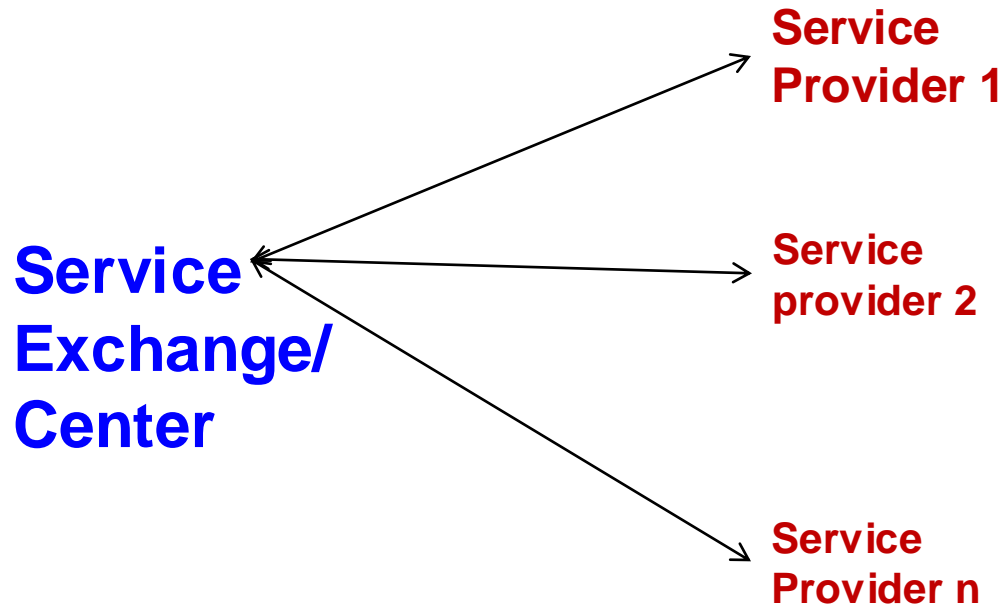


Influence Maximization/Minimization



**Top-k Nodes in a
Web-based Network**

Outsourcing/Crowdsourcing of Services



Cost Curves

**Strategic Service Providers, Budget Constraints,
Lead Time Constraints,
Cost Minimization, Multiple Attributes**



Location Based Crowdsourcing



Mechanism Design Meets Computer Science, Communications of the ACM, August 2010

A Challenging Current Problem: Incentive Compatible Learning

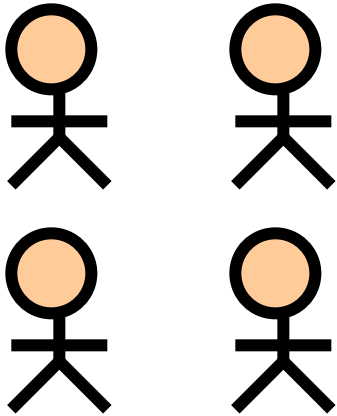
How do we ensure that the data provided by the users is **accurate and truthful**?

How do we do inference
in **dynamic settings** when the parameters
of the problem are held by **strategic agents**?

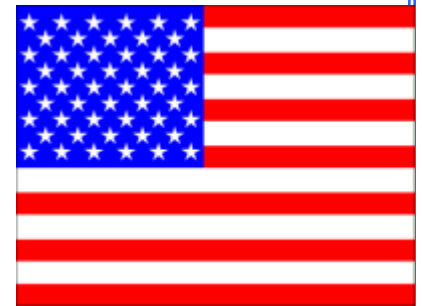
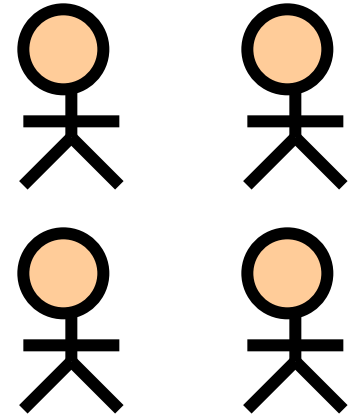
This calls for a marriage between
game theory, mechanism design
and **machine learning** and offers an exciting
collaboration opportunity



Another Challenging Immediate Problem



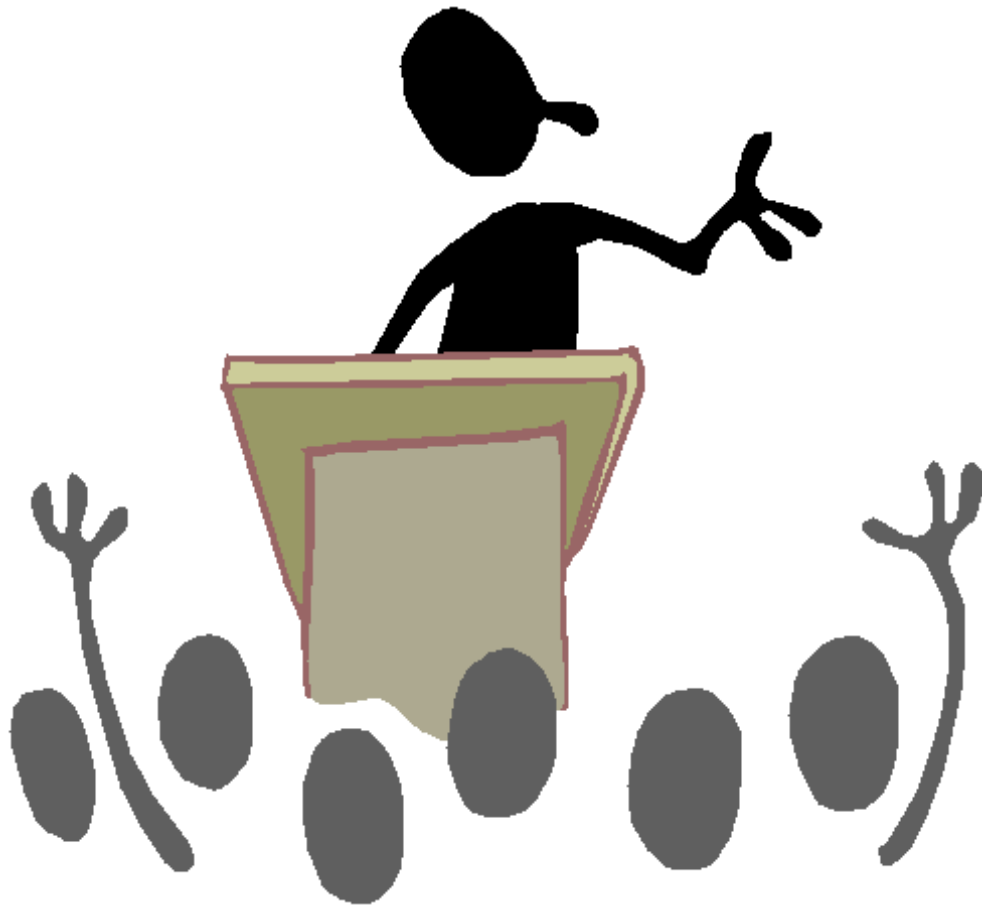
Researchers
from academia,
labs, industry



Researchers
from academia,
labs, industry



Questions and Answers ...



Thank You ...