Incentive design for social computing: Interdisciplinarity time!

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- What do **you** view as the most important/interesting/exciting aspect of social computing?
- What’s **your** vision of how theory can help social computing?”
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- Design $\implies$ Theory
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Answer: Give-&-take
- Design ⇔ Theory: HCI ⇔ Theory ⇔ Behavioral economics

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Incentive design for social computing: New theoretical directions

- Information elicitation with *endogenous* proficiency (Peer-grading)
  - [Dasgupta-Ghosh, WWW 2013]

- *Cardinal contests* (Crowdsourcing innovation)
  - [Ghosh-Hummel, WWW 2015]

- Multi-armed bandits with *endogenous* arms
  (Learning quality of user-generated content)
  - [Ghosh-Hummel, ITCS 2013]
Social-psychological rewards: Attention, status, virtual points, ...

- **Modeling attention rewards**: *Attention allocation as mechanism design*
  - [Ghosh-McAfee, WWW 2011; Ghosh-Hummel, EC 2011, ...]
  - Number of contributions to display, page breaks, ...

- **Virtual point rewards**
  - Best-answer mechanisms [Ghosh-Hummel, WWW 2012]

- **Gamification**: A game-theoretic approach
  - Badge design (absolute vs relative, information about winners); badges vs leaderboards
Incentives in crowdsourcing: ‘Behavioral’ design

- Effective incentive design: Accurate model of agents
- ‘Real’ users may not behave like ‘standard’ economic agents
  - Empirical, experimental studies on online platforms
  - Behavioral economics
- What does this mean for analytical design?
Incentives in crowdsourcing: ‘Behavioral’ design

What agents choose amongst: Optimal contest design for ‘simple’ agents
- [Ghosh-R. Kleinberg, EC 2014]
- Design: Badges or leaderboards, quantity vs quality, . . .
- Theory: LP techniques for contest design, subequilibria, . . .

How agents choose: Optimal contract structure in crowdsourcing markets
- [Easley-Ghosh, EC 2015]
- Expected utility: Fixed-payment contracts are optimal
- Prospect theory: Contests can dominate, for real populations!
Incentives in crowdsourcing: ‘Behavioral’ design

Takeaways:

What agents choose amongst: Optimal contest design for ‘simple’ agents
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- Design: Badges or leaderboards, quantity vs quality, ...
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Theory ⇔ Qualitative design implications
Behavioral design: Deviations from classical models ‘matter’!
Interdisciplinarity: Theory, behavioral experiments, HCI

- Theory ⇔ Behavioral research
Interdisciplinarity: Theory, behavioral experiments, HCI

- Theory ⇔ Behavioral research
- Game theory ⇔ Interface design: **Interface defines game!**
  - Available rewards (Attention on YouTube: Number of views)
  - Information as design choice (What do agents know?)

Going forward: Interdisciplinarity time!
Interdisciplinarity: Theory, behavioral experiments, HCI

- Theory ⇔ Behavioral research
- Game theory ⇔ Interface design: Interface defines game!
  - Available rewards (Attention on YouTube: Number of views)
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- Interface design ⇔ Behavioral economics: Framing effects
Interdisciplinarity: Theory, behavioral experiments, HCI

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Theory ⇔ Design of social computing environments:

Behavioral science ⇔ Theory ⇔ HCI

Thank you!