Market Design of Evaluation

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Outline

- Summary of the paper
- Clarification questions
- Questions about the model and its assumptions
- new ideas

Properties of Evaluation

- public good
  - free rider
- opportunity cost
  - free rider
  - under provision
- production plans are contingent
  - inefficiency

Summary of Contributions

- Base Model
  - given r_j and s_j, broker calculates the efficient allocation, offers payments for evaluation
  - batch-mode game; one-at-a-time game
- Efficient Payment Schemas
  - SASP
  - Budget Balance
  - Voluntary Participation
- Expanded Model
  - different expertise, different informativeness and correlated tastes.
  - using Type-SASP

Clarification Questions

- opportunity cost
- statistical herding
- $g > 1-b$?
- $\rho = pg + (1-p)*(1-b)$
- Coase theorem
- shoot-them-all
- asymmetric inefficiency in evaluation acquisition

model & its assumptions

- players report evaluations honestly?
- how to deal with g, b, s, and r which are highly subjective and difficult to estimate
- Metrics of evaluation, which is best
  - Binary (eBay)
  - multi-level (Amazon)
  - domain-specific (PC Magazine)
- computational burden on central broker

Evaluation Quality

- How to differentiate the liar and the misjudged evaluator? Can we punish those liar? If yes, how?
- Would you prefer 100,000 evaluations of unknown quality to 10 evaluations of high-quality?
- How many evaluations will lead to the consensus?
- One-time consuming and continued consuming
- voluntary vs. coerce

Conclusion

- some work has been done, much to do
- subjective arguments make it difficult
- voluntary vs. coerce
- any other mechanism to achieve global optimum?

Bayes' Rule

The essence of the Bayesian approach is to provide a mathematical **rule** explaining how you should change your existing beliefs in the light of new evidence.

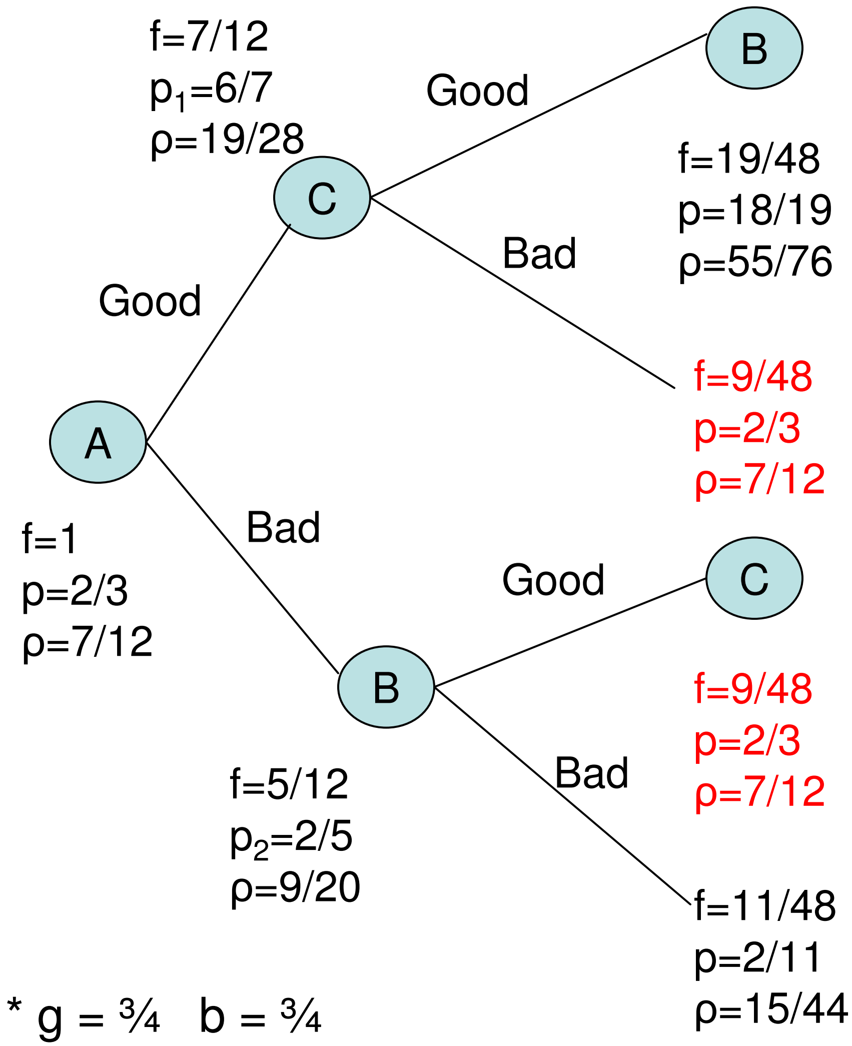
$$\text{posterior} = \frac{\text{conditional likelihood} * \text{prior}}{\text{likelihood}}$$

$$P(R=r \mid e) = \frac{P(e \mid R=r) \; * \; P(R=r)}{P(e)}$$

$P(R=r|e)$: probability that random variable R has value r given evidence e
$P(e \mid R=r)$: probability that e is true when R has value r
$P(R=r)$: prior probability that R has value r

$P(e) = P(R=0, e) + P(R=1, e) + ...$

A		B		C	
Good	Bad	Good	Bad	Good	Bad
12	-24	12	-24	1000	-1000



Computation of binary tree

f=1

p=2/3

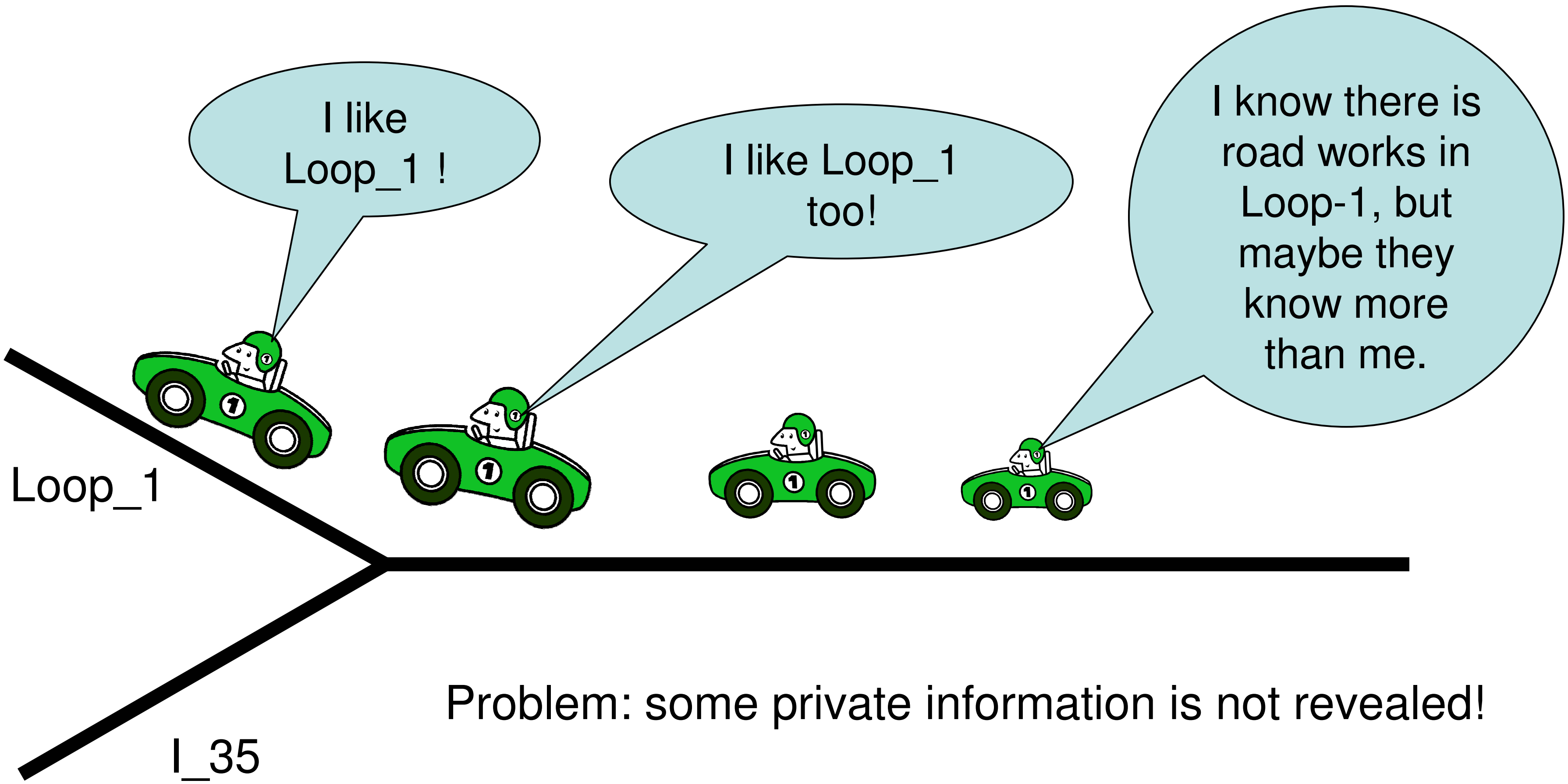
$\rho = pg+(1-b)(1-p)$
$= 2/3 * 3/4 + 1/4 * 1/3 = 7/12$

p_1 = pr(is Good & evaluates Good) / pr (evaluates Good)
$= (2/3 * 3/4) / 7/12$
$= 6/7$

p_2 = pr (is Good & evaluates Bad) / pr (evaluates Bad)
$= (2/3 * 1/4) / 5/12$
$= 2/5$

…

Statistical Herding



Problem: some private information is not revealed!

Interesting points: asymmetric inefficiency in evaluation acquisition.