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Satellite conference on "Evolution and Game Theory"
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Combined Problems of Cooperation and Coordination

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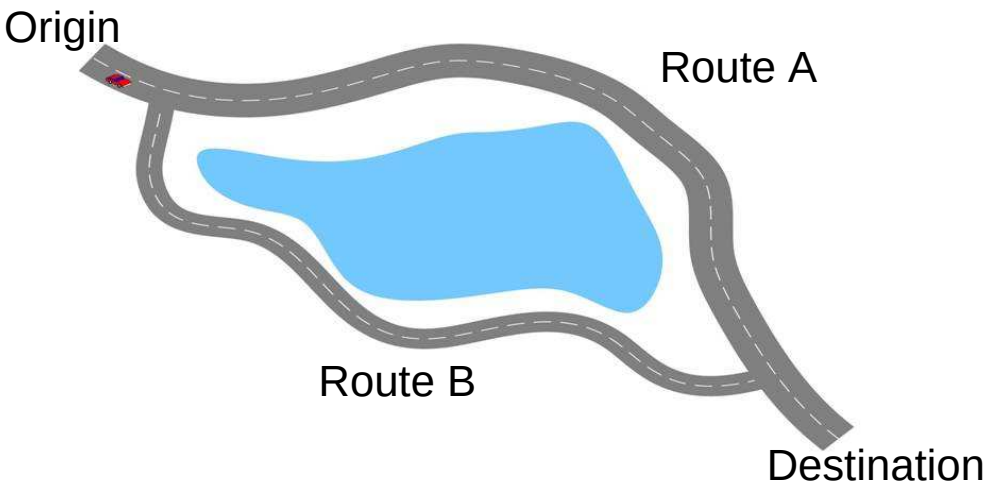
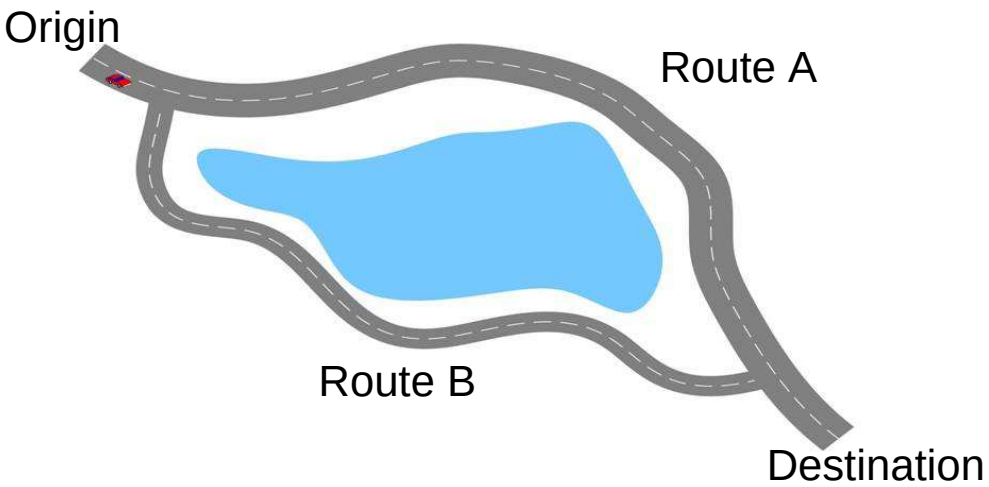
Route choice situation



Capacity restricted links
(linear velocity–density relation)
→ *Wardrop*–equilibrium:
equal travel times on all
routes of an o–d pair

Route choice situation



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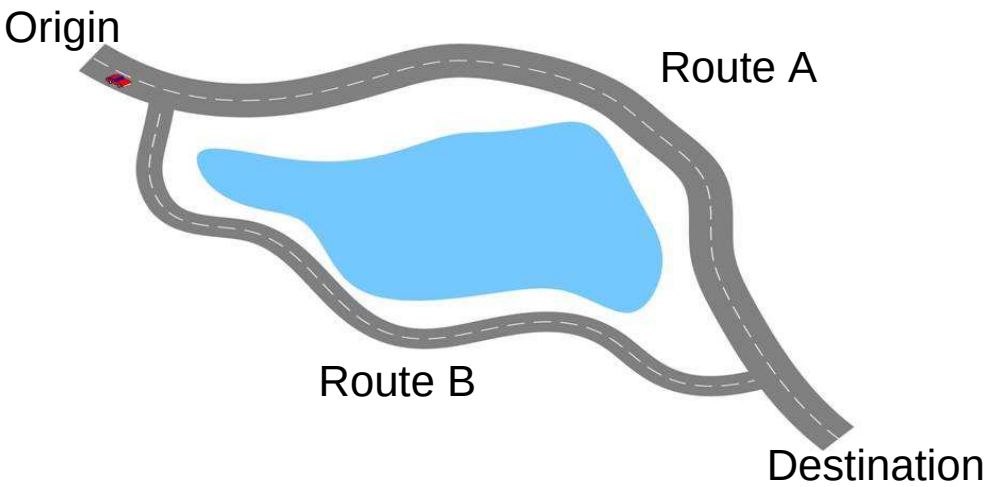

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4-person exp.:

N_A	4	3	2	1	0
N_B	0	1	2	3	4
P_A	-300	0	300	600	-
P_B	-	0	-100	-200	-300
$\overline{P}_{user}$	-300	0	100	0	-300

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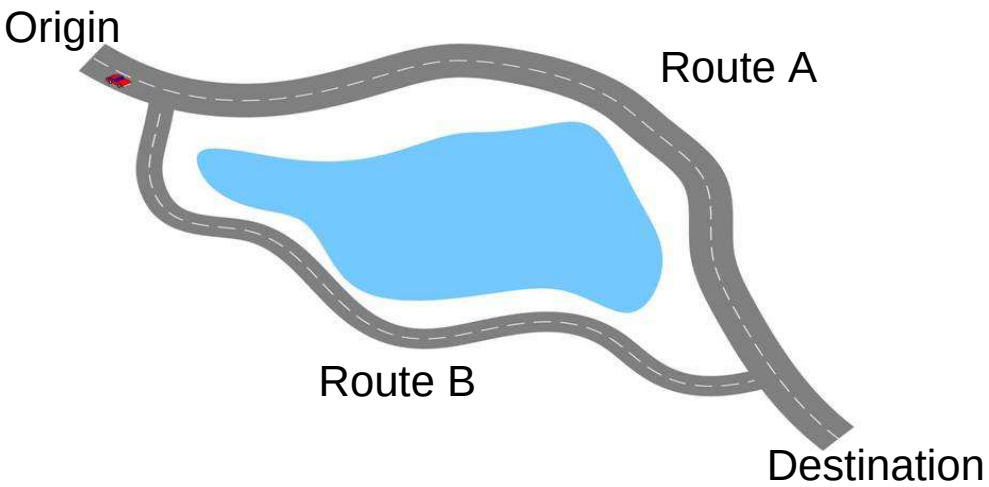

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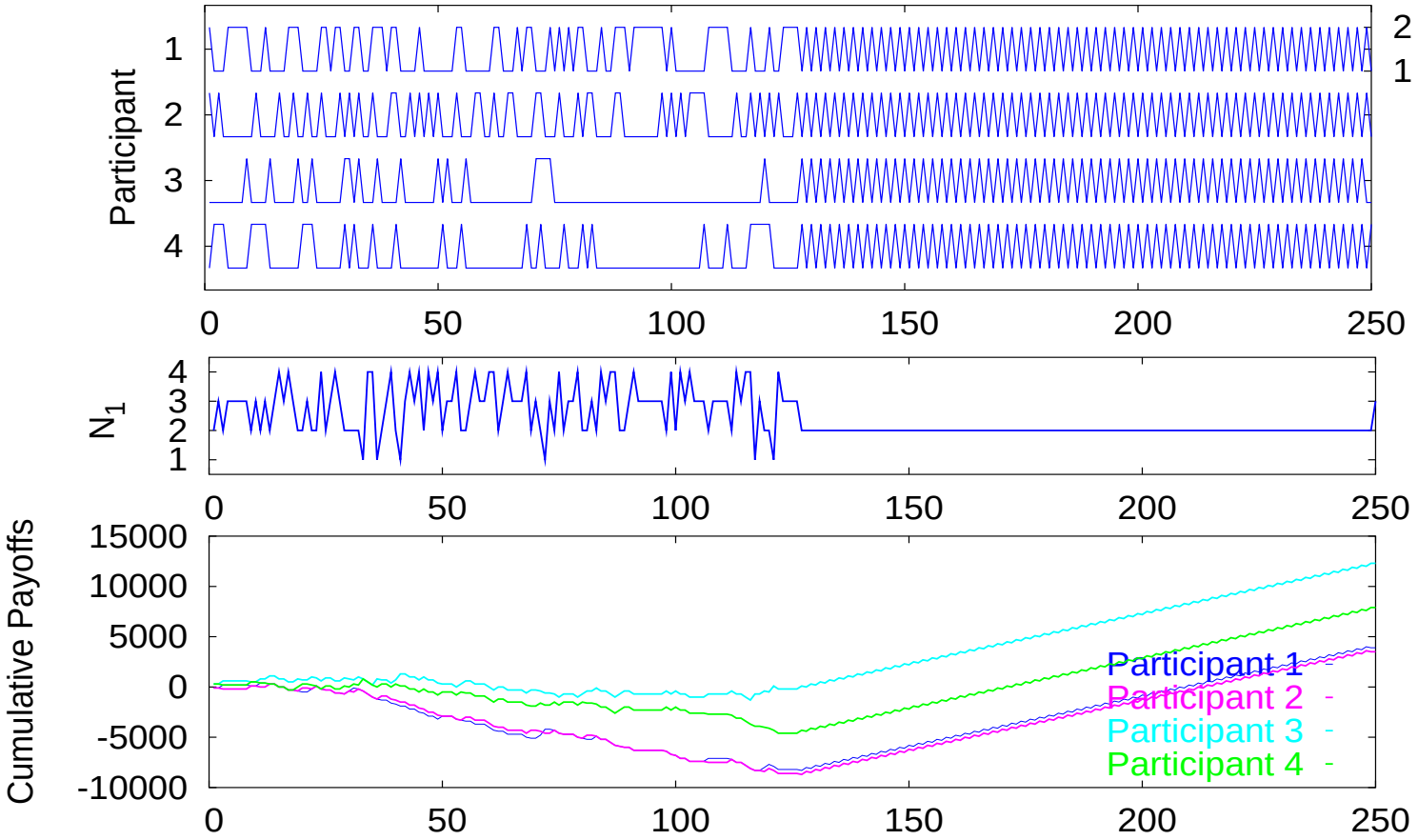
2-person exp.:

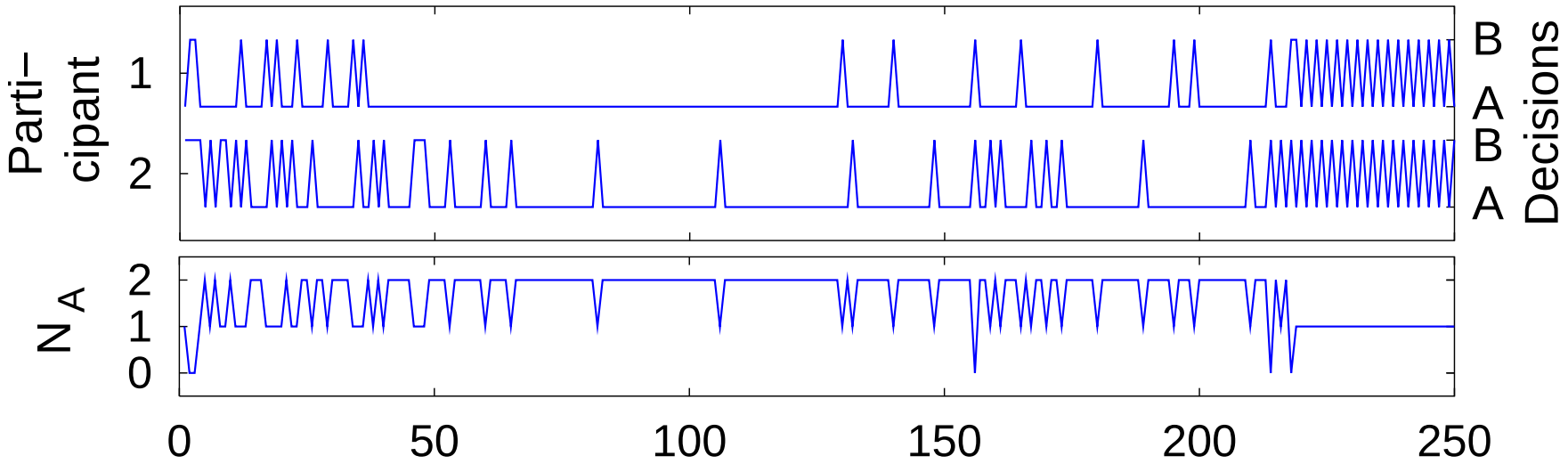
N_A	2	1	0
N_B	0	1	2
P_A	0	300	-
P_B	-	-100	-200
$\overline{P}_{user}$	0	100	-200

Timeseries example – 4 participants



cooperation occurred sometimes, but very rarely

Timeseries example – 2 participants



cooperation in 17 out of 24 groups

Helbing, Schönhof, Stark, Hołyst (2005), *Adv. Compl. Syst.* **8**.
Stark, Helbing, Schönhof, Hołyst (2007), *In: Games and Economic Behaviour*, Palgrave, MacMillan (in press).

Route Choice Game

Route Choice Game

	A	B
route A	0	300
route B	−100	−200

Route Choice Game

Route Choice Game

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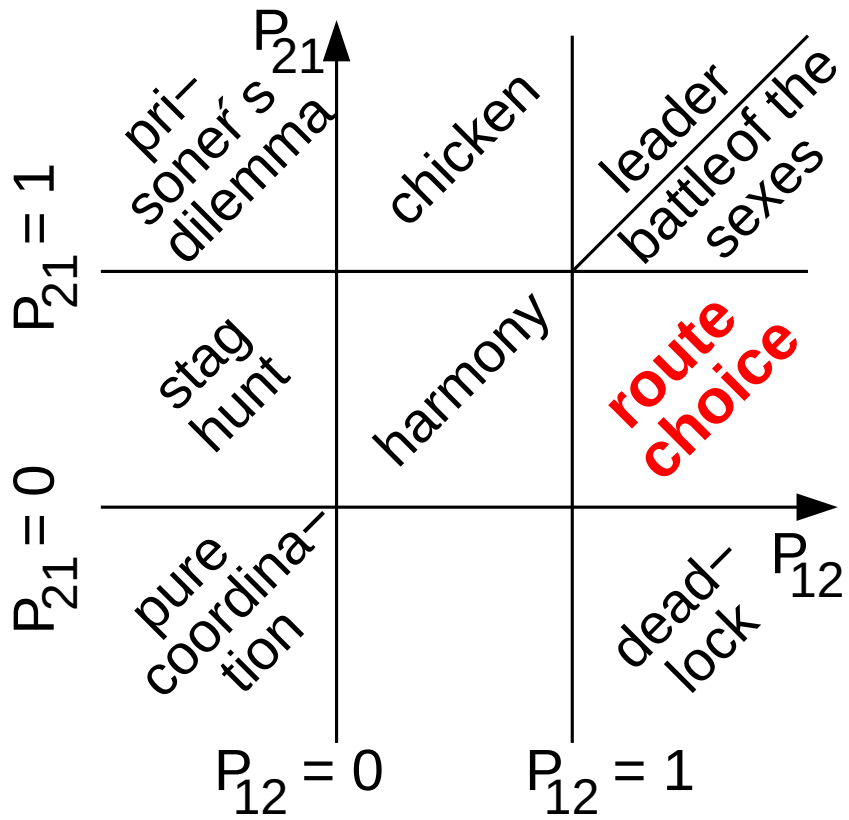
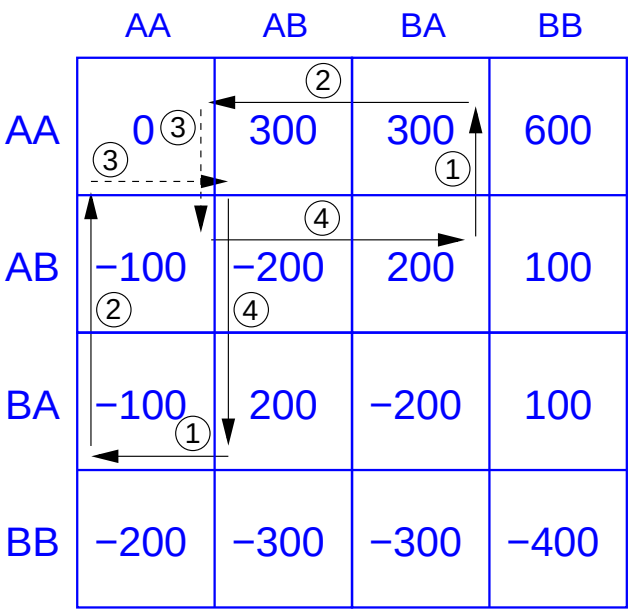
ordinal generalization

	1	2
strategy 1	1	P_{12}
strategy 2	P_{21}	0



Eriksson & Lindgren (2002) (extended)

2nd-order RCG



- 1 decision regarding 2 timesteps
- illustrates the participants' challenge in the experiments
- AA still strictly dominant
- equilibrium not Pareto-efficient
- contains both:
  - a coordination problem, and
  - a Prisoners' Dilemma

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- There is empirical evidence of individuals learning to take turns (Helbing, Schönhof, Stark, Hołyst (2005))

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→ we find combined problems of cooperation and coordination

- There is empirical evidence of individuals learning to take turns (Helbing, Schönhof, Stark, Hołyst (2005))
- Questions:
  - What are the theoretical implications of these combined problems of cooperation and coordination?
  - To what extent are they different to previous results?
  - ...?