APPLIED MECHANISM DESIGN FOR SOCIAL GOOD

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CMSC828M
Tuesdays & Thursdays
2:00pm – 3:15pm

COMPUTER SCIENCE
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Markets come in many forms …

… some of which don't conform to conventional notions of markets …

… and some in which money may play little or no role.

– excerpt from *Who Gets What – and Why*

EXAMPLE: MATCHING MARKETS

In matching problems, prices do not do all – or any – of the work

Agents are paired with other (groups of) agents, transactions, or contracts

- Workers to firms

- Children to schools

- Residents to hospitals

- Patients to deceased donors

- Advertisements to viewers

- Riders to rideshare drivers

EXAMPLE: FOOD BANK ALLOCATION

Food banks supply nutrition to the needy for free or at a reduced cost

- Much of that food comes from donors (e.g. supermarkets, manufacturers)

Distribution is overseen by a large non-profit organization, Feeding America

- Previously: **centralized allocation** based on perceived need of food banks

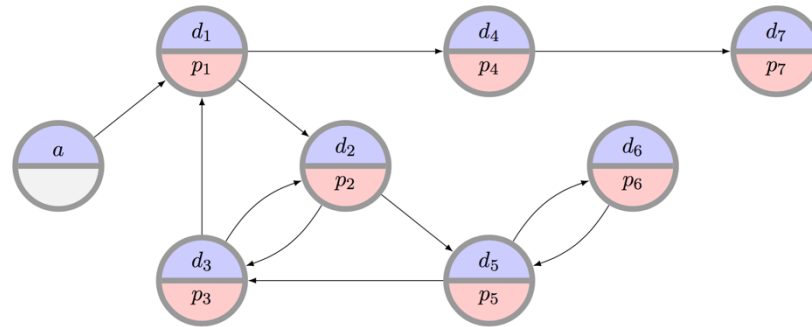- Currently: food banks bid in an **online auction** using a fake currency for loads of donated food.

EXAMPLE: KIDNEY EXCHANGE
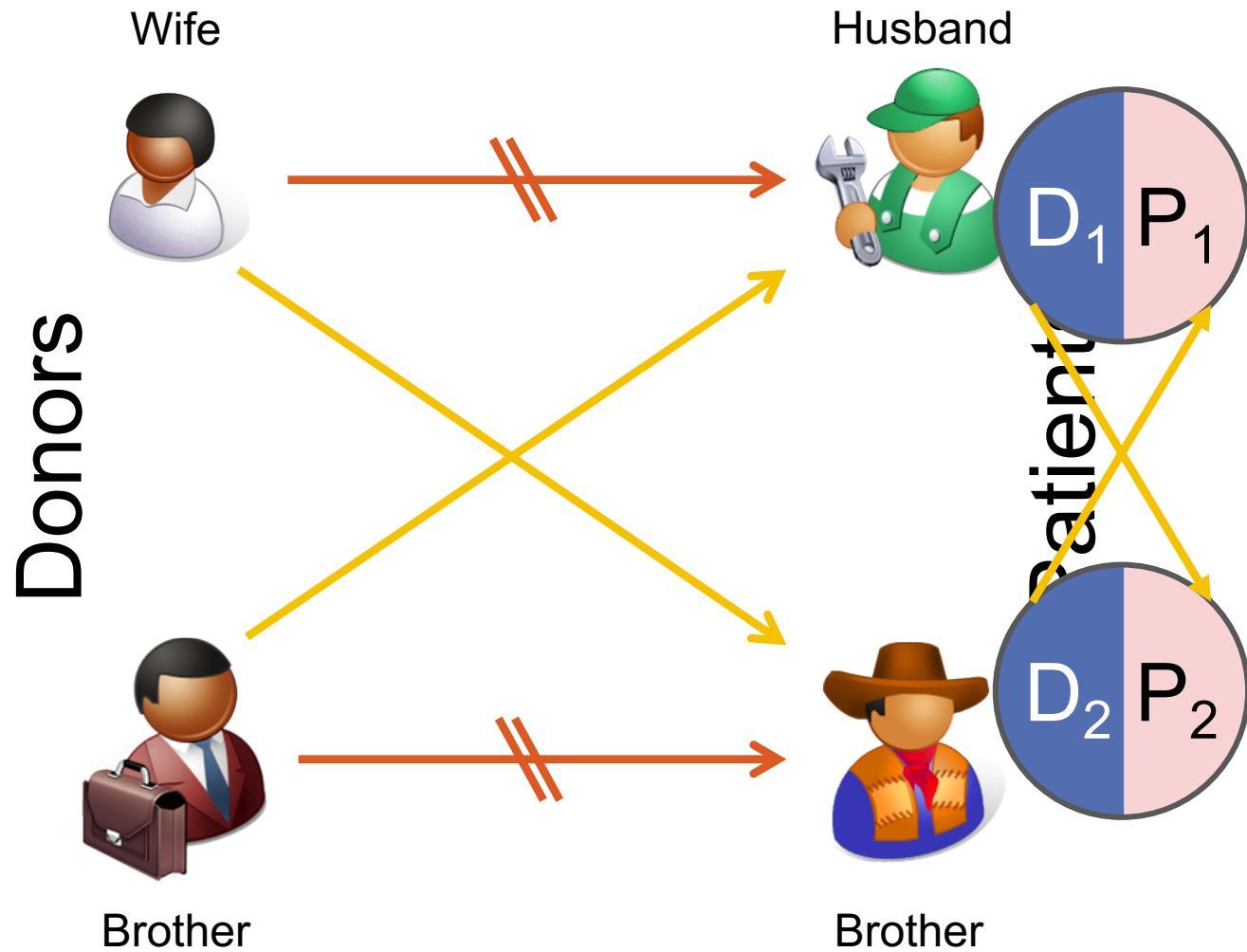
(2- and 3-cycles, all surgeries performed simultaneously)

EXAMPLE: KIDNEY EXCHANGE
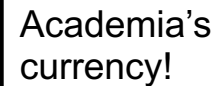

What is the "best" matching objective?

- Maximize matches right now or over time?

- Maximize transplants or matches?

- Prioritization schemes (i.e. fairness)?

- Modeling choices?

- Incentives? Ethics? Legality?

Can we design a mechanism that **performs well in practice**, is **computationally tractable**, and is **understandable by humans**?

ADMINISTRATIVE DETAILS

Meet twice per week, discuss 1-2 papers per class

Course project: semester-long, can be applied, can be theoretical – the goal is to create a publishable paper!

Academia's currency!

We'll have a few guest lecturers "from the real world"

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