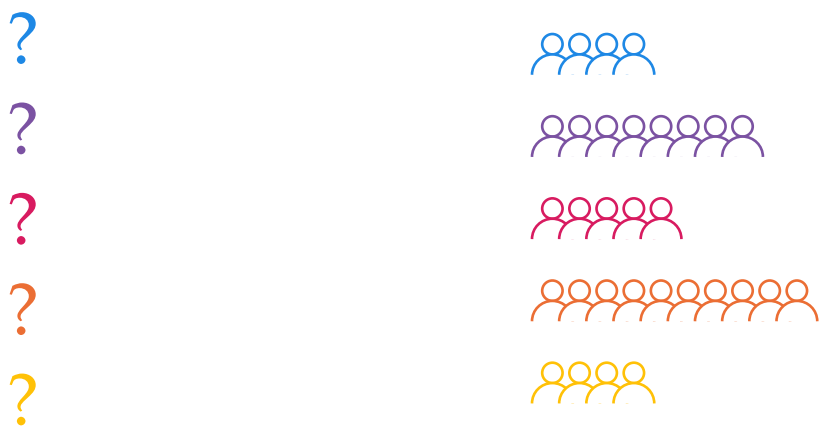
Mechanism Design for Participatory Budgeting

Simon Rey

Institute for Logic, Language and Computation (ILLC)
University of Amsterdam

EUMAS 2022 — Doctoral Consortium

Computational Social Choice



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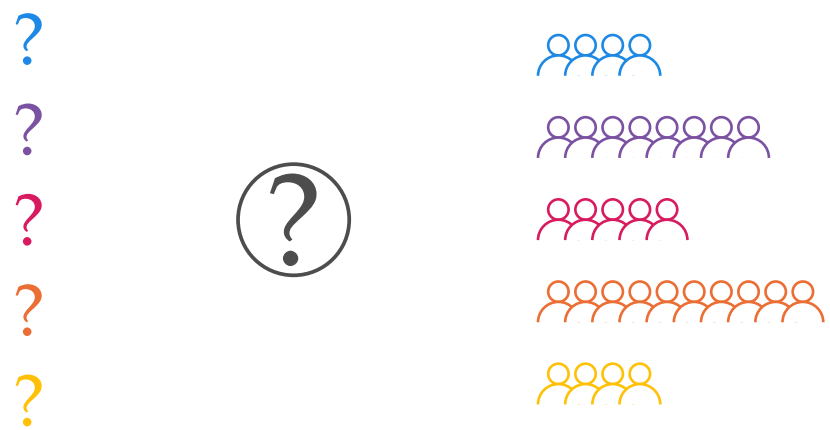

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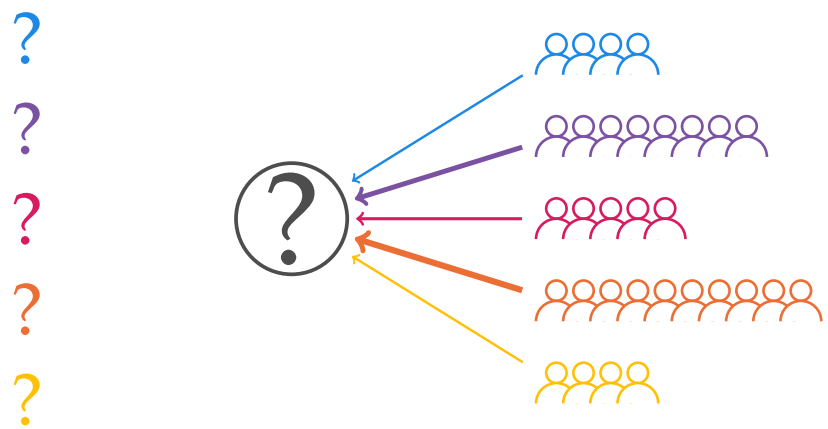

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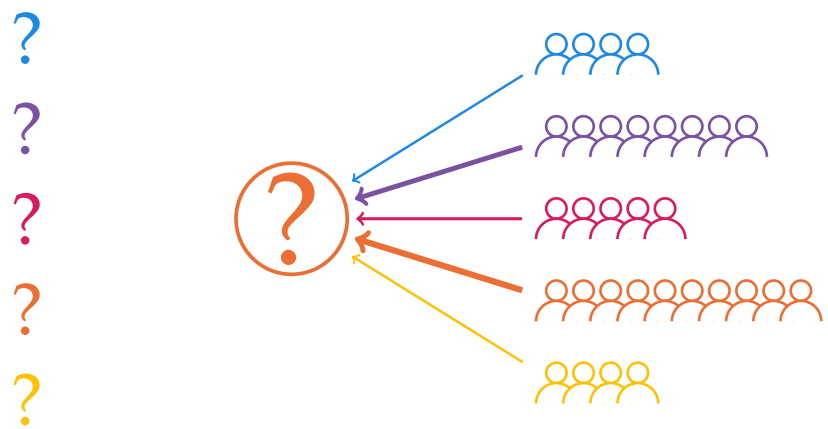

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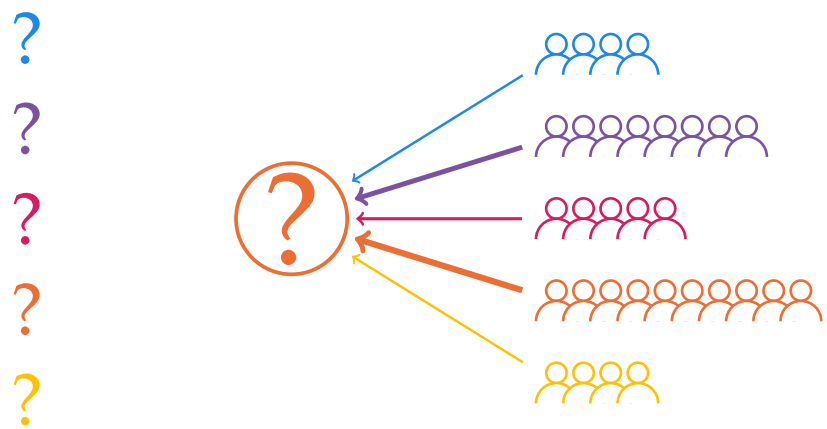

Computational Social Choice: The study of how to efficiently aggregate preferences into suitable collective choices.

Participatory Budgeting

© Marianne de Heer Kloots

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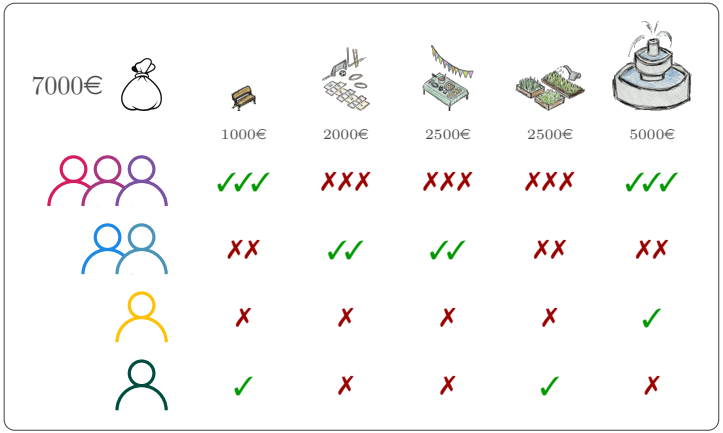
Mechanisms for Participatory Budgeting



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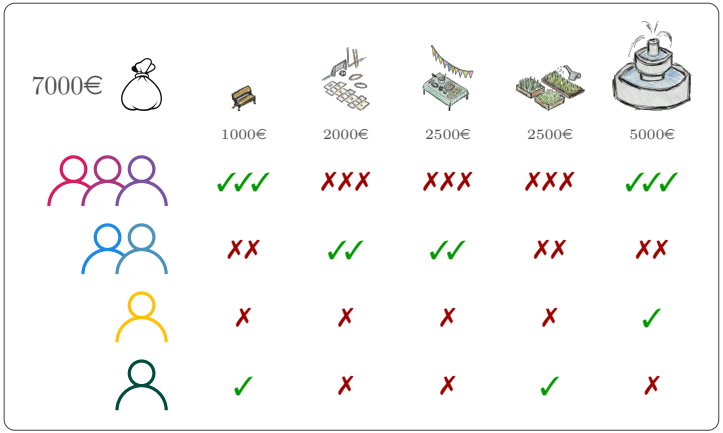

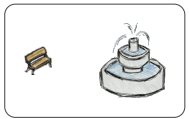

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↳ All these properties cannot be achieved simultaneously, but we can study them independently and try to identify the overlap!

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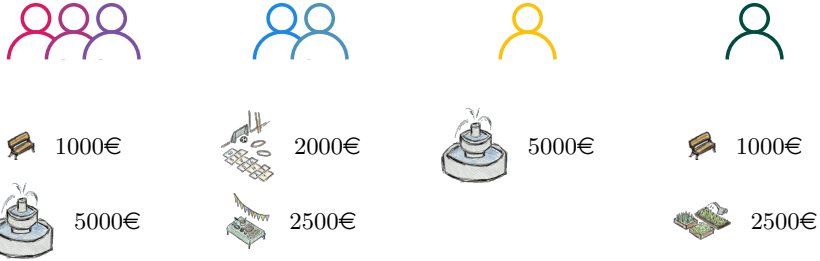

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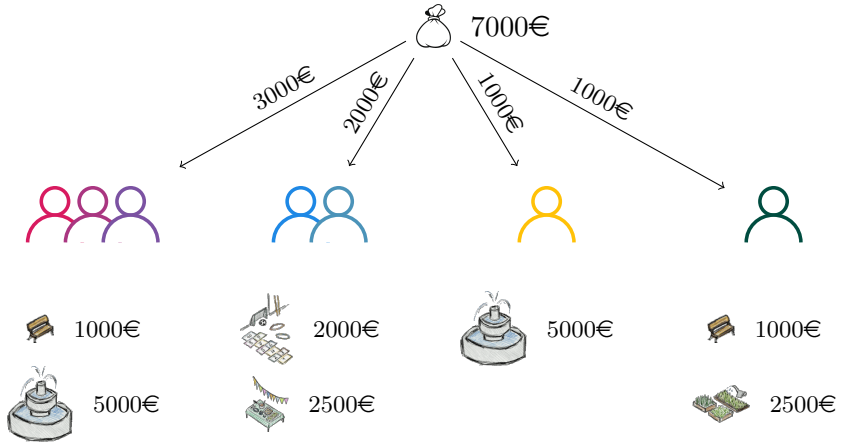

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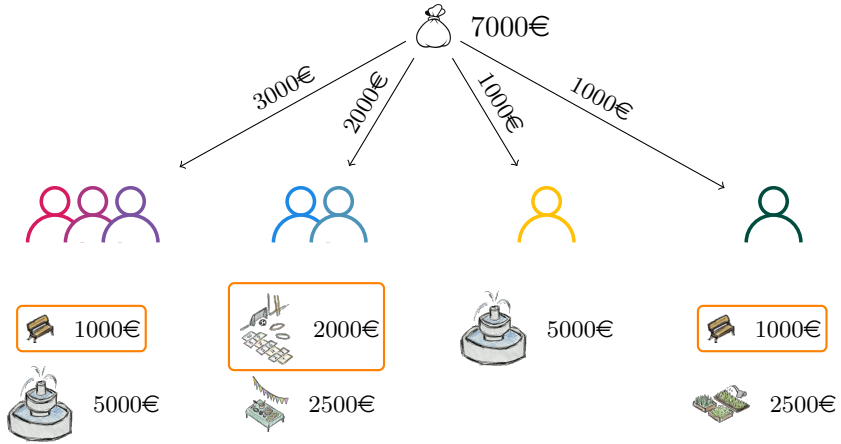

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I have studied related problems in:

- Lacker, Maly, Rey (IJCAI 2021): looking at fairness in a long-term approach to particiaptory budgeting;
- Maly, Rey, Endriss, Lackner (Working paper): defining fairness in terms of effort for approval-based participatory budgeting.

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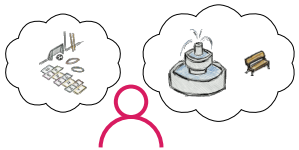

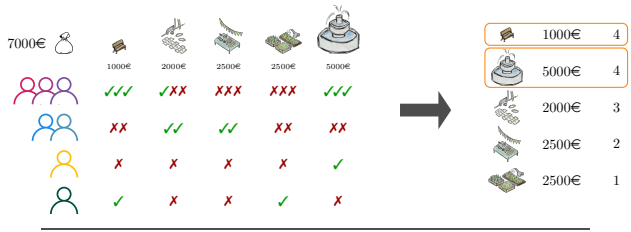

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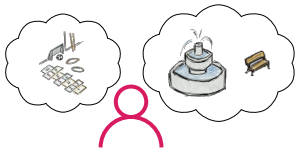

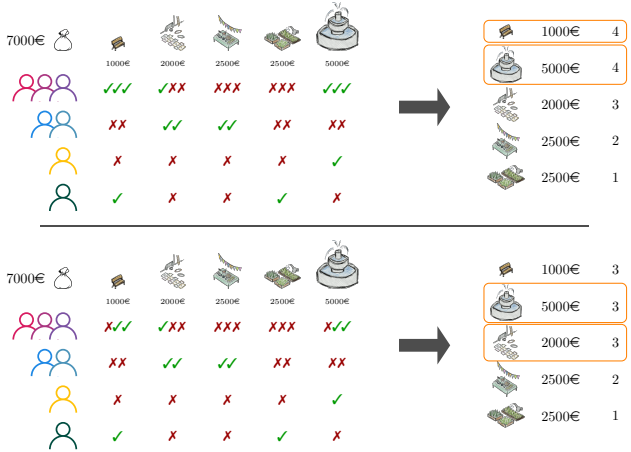

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I have studied related problems in:

- Rey, de Haan, Endriss (IJCAI 2021): incorporating the first stage of participatory budgeting into the model to look for mechanisms incentivizing agents to submit truthful proposals.

Truth-Tracking

Assuming that voters are noisy estimate of a ground truth, are mechanisms good at recovering that ground truth?

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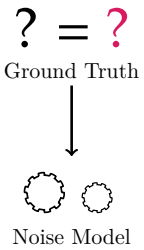

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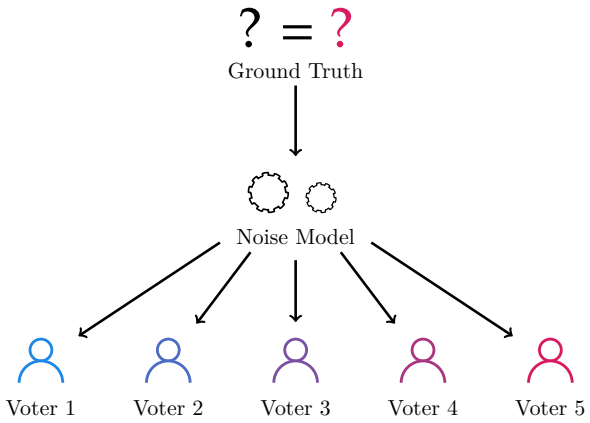

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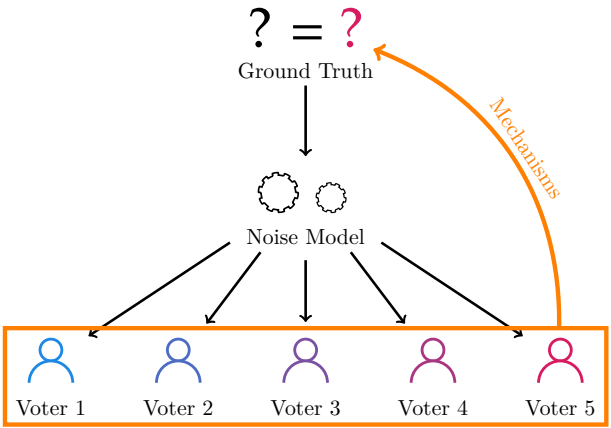

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- Can we find use-cases of the truth-tracking approach to participatory budgeting?
- How to define noise models when it comes to particiaptory budgeting?
- What sorts of mechanisms would be good at recovering the truth?

Are mechanisms and their properties robust to small variations in the model?

Qu'est-ce que la bonification des projets « quartiers populaires » ?

Certains projets sont estampillés « quartiers populaires ».

Ceci signifie qu'ils sont localisés dans ces quartiers ou bénéficient largement à leurs habitantes et habitants. Pour les arrondissements concernés par ces projets, un nombre minimum de projets lauréats estampillés « quartiers populaires » est garanti. Ce nombre est fixé en fonction de la population habitant dans ces quartiers.

Concrètement, certains projets « quartiers populaires » pourront être lauréats grâce au bénéfice de cette bonification, et quand bien même ils auraient initialement un moins bon profil de mérite que d'autres projets non « quartiers populaires ». Dans l'exemple ci-dessous, et dans le cas où l'arrondissement a 2 projets lauréats dont au moins 1 projet « quartiers populaires », la bonification permet de faire passer le projet 3 en seconde position sur le classe final, et donc d'être lauréat !

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I have studied related problems in:

- Rey, de Haan, Endriss (KR 2020): encoding participatory budgeting as an instance of judgment aggregation to have a more general approach to it.

Algorithmic Efficiency

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- What kind of proportional criteria can be enforced in polynomial time?
- What would be the computational complexity of tracking the truth in participatory budgeting?
- Can adaptable mechanisms be computationally efficient?