

# The Museum of Social Choice

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## Abstract

We present a project to build a museum of social choice, in which computational aspects will play an important role.

## Introduction

With the tremendous importance of Internet nowadays, millions of software agents are interacting and have to make collective decisions. Collective decisions are also made by humans in political elections as well as in their everyday life: family members have to choose the brand of the toothpaste and the name of the cat, agents with multiple selves invoke voting rules to make difficult decisions, agents match with each other, others cut cakes, and so on.

It is paradoxical that activities such as painting, sculpture or architecture have so many dedicated museums while social choice has none. A museum of social choice will attract not only crowds of human visitors, but also millions of software agents. It will have a tremendous impact on democracy as well as in art.

The rest of the paper presents some of the highlights of the future museum. Some decisions have still to be made by the museum board; some are on the edge of being taken, but we are awaiting the outcome of the vote.<sup>1</sup>

## Entrance Fees

There was an active discussion among the board members, about whether we should have money in the system or not. The final decision was to have *ordinal entrance fees* (we are still looking for a well-trained ordinal accountant):

adult non-member  $\succ$  adult member  $\succ$  child  $\succ$  dog  $\succ$  robot  $\succ$  software agent

It is still under discussion whether visitors will be allowed to bribe the museum cashiers. To maintain a budget balance, some visitors will be assigned to chores such as cleaning the toilets or preparing the sushis.<sup>2</sup>

## The permanent collections

**The beautiful election room** Some of the best pieces of the museum will be exhibited there, such as beautiful voting rules or beautiful election instances. What is the *Mona Lisa* of election systems? You will discover it when visiting the museum.

**The Eurovision song contest room** Open on specific days only. European Visitors will represent their country and vote! These days, visitors from Liechtenstein, Monaco, Andorra, San Marino and the Vatican City will have a reduced entrance fee.

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<sup>1</sup>The museum rules stipulate that the board decisions should be made by the third-order Dodgson rule, a rule invented specifically for the museum.

<sup>2</sup>Never both simultaneously.

**The manipulation room** A collection of famous manipulations by well-known artists. Destructive manipulations on specific days only.

**The TEQ room** For adults only.

**The hedonic game room** Same thing.

**The Shapley room** For dummy visitors.

**The children's room** Children will not be allowed to leave until they arrive at an envy-free allocation of the toys. The visitors will receive an NP-hard manipulation problem instance to solve. Those who manage to get it right will receive a toy from a visitor who did not get it right.<sup>3</sup>

**The complexity room** For children too. They will have lot of fun, and will quickly become experts of parallel access to NP, as they will have to solve a  $P_{||}^{NP}$ -complete problem to get out of the room (it will also be very convenient for parents). The room will be permanently closed in the eventuality where  $P = NP$  is proven to be true.

**The knockout tournament room** Only one visitor will leave it!

## Temporary exhibitions

Leonardo and elections (the *Da Vinci rule*), judgment aggregation in the middle ages, and more.

## The cafeteria

The museum cafeteria will serve Preflib sushis as well as cakes to be cut by visitors (moving knives will be available).<sup>4</sup>

## Restrooms

There will be  $n$  restrooms located optimally in different points of the museum. In case of affluence, a randomized strategyproof mechanism assigning visitors to toilets will be applied, with visitors reporting their maximum waiting time.

## The museum shop

Handled by our three wonderful staff members Vickrey, Clarke and Groves.

## Further work

Finding the funds for setting up the museum is left for further study. We suspect this might be infeasible, although we did not manage to prove an impossibility theorem.

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<sup>3</sup>Suggested by an anonymous referee.

<sup>4</sup>Kondor VII, specialist of inverted social choice [1], suggested to us that we could have an inverted cafeteria where cakes would be cutting agents. We have decided against it.

## Acknowledgements

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## References

- [1] Marky D. Kondor VII. When Alternatives Vote over Voters. *Proceedings of the Third International Workshop on Computational Social Choice (COMSOC-2010)*, V. Conitzer and J. Rothe (eds), 493.

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