Funded PhD position on computational social choice: Possibilities in classification aggregation

We are currently looking for candidates to a PhD position at LAMSADE, Université Paris-Dauphine, on the subject of *Possibilities in classification aggregation*.

Subject

Classification Aggregation (CA) has emerged recently as a new area of interest in social choice (Dokow and Holzman, 2010). In this setting, we are interested in studying functions that aggregate classifications, which are assignments of objects to categories. The set of objects and categories are pre-determined and multiple individuals classify a set of objects, and a CA function produces a societal classification. Interestingly, this setting is related to, but different than, one of the classical settings studied in multiple criteria decision aiding, which aim at sorting objects into preferentially ordered categories on the basis of evaluations of these objects on multiple points of view (Bouyssou and Marchant, 2007).

Recent works have shown the interest of this setting, and impossibility theorems have been proposed (Maniquet and Mongin, 2016; Cailloux et al, 2024).

In this proposal we suggest investigating possibilities of constructing reasonable classifiers, by weakening or relaxing axioms in impossibility theorems so as to allow for functions that satisfy them to exist. Our goal will be, following the approach proposed in axiomatic social choice, to characterize such functions and argue that the resulting function is reasonable in the sense of being a minimal necessary relaxation of axioms that would otherwise conduct to an impossibility.

References

- Awad, Edmond, et al. "Experimental assessment of aggregation principles in argumentation-enabled collective intelligence." ACM Transactions on Internet Technology (TOIT) 17.3 (2017): 1-21.
- Bouyssou, Denis, and Thierry Marchant. "An axiomatic approach to noncompensatory sorting methods in MCDM, I: The case of two categories." European Journal of Operational Research 178.1 (2007): 217-245.
- Ganzer-Ripoll, Jordi, et al. "Combining social choice theory and argumentation: Enabling collective decision making." Group Decision and Negotiation 28.1 (2019)
- Dokow, Elad, and Ron Holzman. "Aggregation of non-binary evaluations." Advances in Applied Mathematics 45.4 (2010): 487-504.
- Maniquet, François, and Philippe Mongin. "A theorem on aggregating classifications." Mathematical Social Sciences 79 (2016): 6-10.
- Cailloux, O.; Hervouin, M.; Ozkes, A. I.; and Sanver, M. R. Classification aggregation without unanimity. Mathematical Social Sciences, 128: 6-9. 2024.

Targeted candidates

Students with a master degree who have received formal education in quantitative subjects such as Mathematics, Computer Science, and Economics with an interest in career in applied or theoretical research are welcome to apply.

Applicants must send their CV, coordinates of a referent person, a letter of motivation and a listing of the courses they took in masters, together with their marks, to the three contact persons indicated here below, until 10 April 2025.

The successful student will be hosted at LAMSADE, Université Paris-Dauphine, a part of Université Paris Sciences et Lettres. The position is to start on 1 October 2025.

She or he will benefit from a "contrat doctoral" (a scholarship ruled by the French Ministry of Higher Education and Research), with corresponding salary.

Research team

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