

Prof. R. Wattenhofer

## Topics on distributed stable matching

In stable matching (also called stable marriage), one must find a matching between two sets of agents, such as men and women, or job applicants and job positions. Each agent has a preference ordering over who they want to be matched with. Moreover, a matching is said to be stable if no pair of matched agents prefer each other compared to their current matching.

Stable matching was first described and solved by Gale and Shapley. Their algorithm is inherently distributed: agents on one side proceed to make proposals to the other side. We can view it as each party starting with their own preference list, talking with each other and at the end deciding whom they want to match with. Stable matching algorithms have already been quite thoroughly studied, but there are still some open problems, even more from a distributed perspective.

Another way to approach this would be to look at what happens when something goes wrong: What if some parties decide they do not want to take part in the stable matching or have an incentive to make it fail? While [1] addresses some of these questions, a lot remains to be solved.



Requirements: We are looking for people in-

terested and with a background in distributed algorithms, communication complexity and/or cryptographic protocols. We will have weekly meetings to discuss the progress of your research.

## Interested? Please contact us for more details!

## Contact

• Marc Dufay: mdufay@ethz.ch, ETZ G93

## References

 Andrei Constantinescu, Marc Dufay, Diana Ghinea, and Roger Wattenhofer. Byzantine stable matching, 2025. URL: https://arxiv.org/abs/2502.05889, arXiv:2502. 05889.