

NUMERICAL METHODS FOR HIGH-DIMENSIONAL MULTI-MARGINAL OPTIMAL TRANSPORT
PROBLEMS

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Multi-marginal OT problems arise naturally in application fields such as electronic structure, fluid dynamics, and data science, but pose a huge challenge for computation. This is because the number N of marginals corresponds, respectively, to the number of particles, timesteps, and datasets, hence one is interested in large N , but the number of unknowns after discretization scales exponentially in N . I will survey some promising recent avenues for tackling the curse of dimension in these problems, with particular emphasis on the Genetic Column Generation algorithm developed jointly with Daniela Voegler, Andreas S. Schulz and Maximilian Penka (SIAM JSC 2022; arXiv:2209.09081 2022) and its applications.