Fast and Flexible Inference of Joint Distributions from their Marginals

Charlie Frogner and Tomaso Poggio

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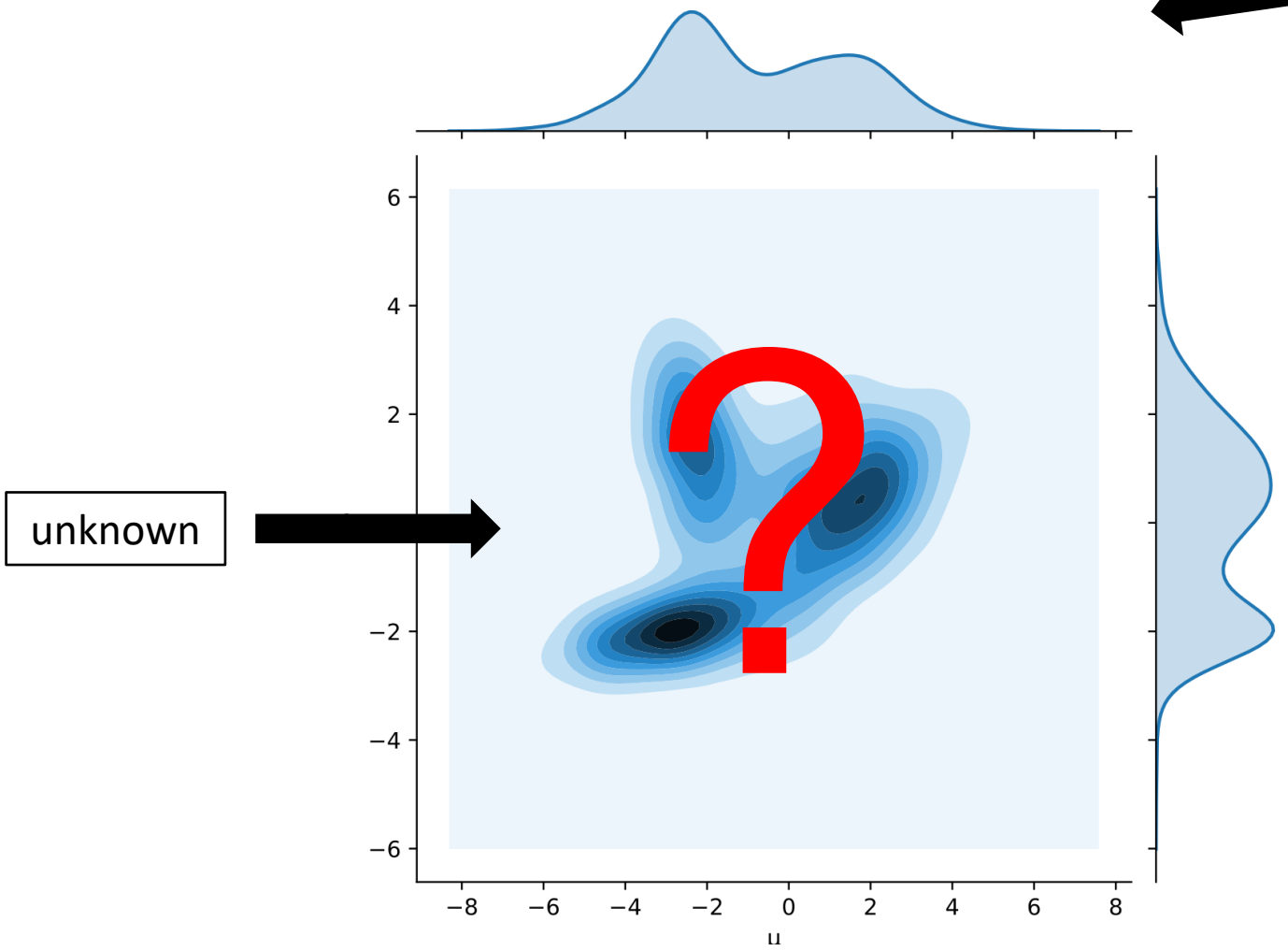

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Existing work:

- Limited to **Bernoulli** marginals, or
- **relaxes** the problem, or
- relies on **approximate inference** by MCMC, or
- solves an **optimal transport** problem.

This work:

- **Unified framework** that includes **wide variety of priors** and some existing methods as special cases.
- Single **exact inference** algorithm.
- **Computationally efficient**.

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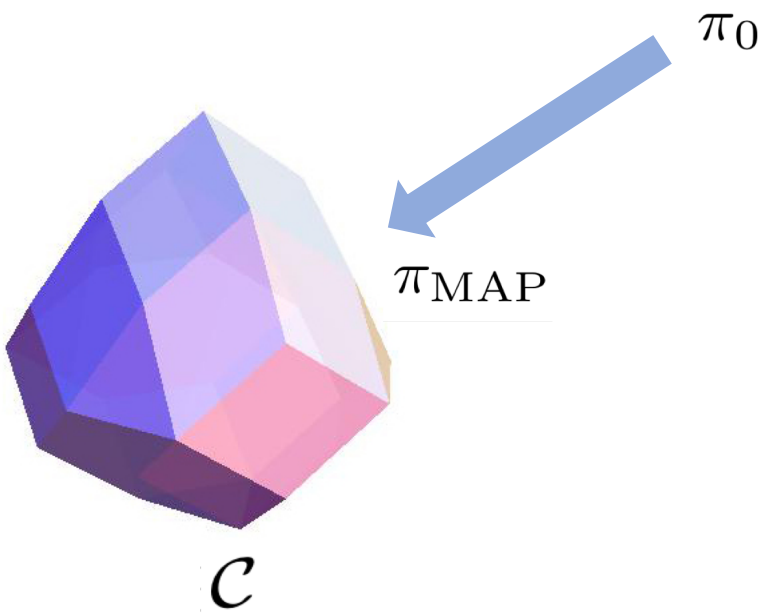
MAP inference = Bregman projection



$$\pi_{\mathrm{MAP}} = \mathrm{arginf}_{\pi \in \mathcal{C}} D(\pi, \pi_0)$$

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