Measure transport approaches to uncertainty quantification

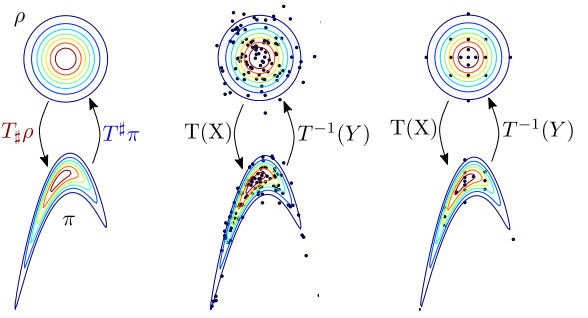
D. Bigoni*, A. Spantini, Y. Marzouk
Massachusetts Institute of Technology

Inference model

$$\tilde{\pi}(\boldsymbol{x}|\mathbf{d}) \propto \mathscr{L}_{\mathbf{d}}(\boldsymbol{x})\pi_{\text{pr}}(\boldsymbol{x})$$

Measure transport

$$\int f(\boldsymbol{x})\nu_{\pi}(d\boldsymbol{x})$$
$$||$$
$$\int f \circ T(\boldsymbol{x})\nu_{\rho}(d\boldsymbol{x})$$



Densities | Monte Carlo | Sparse grid

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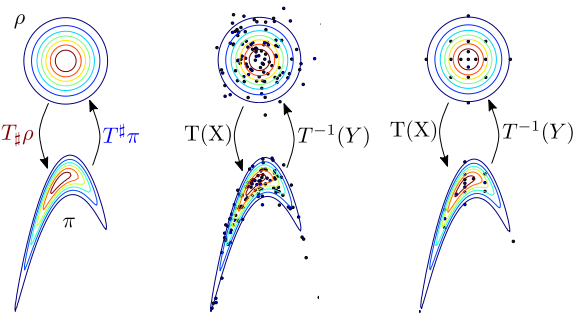

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- Gradient-based optimization
- Parallel learning/generation
- Convergence assessment
- Low-dimensional structures

`https://transportmaps.mit.edu`