[redacted]

in Machine Learning

Optimal Transport

16

- OT has found multiple applications in machine learning

- Comparing distributions/samples is at the heart of ML

- OT provides a principled, theoretically sound approach to do it

- Recently: fast algorithms [Cuturi, 2013; Altschuler et al. 2017; ...], and accompanying theory [Geneveay et al ., 2019,...]

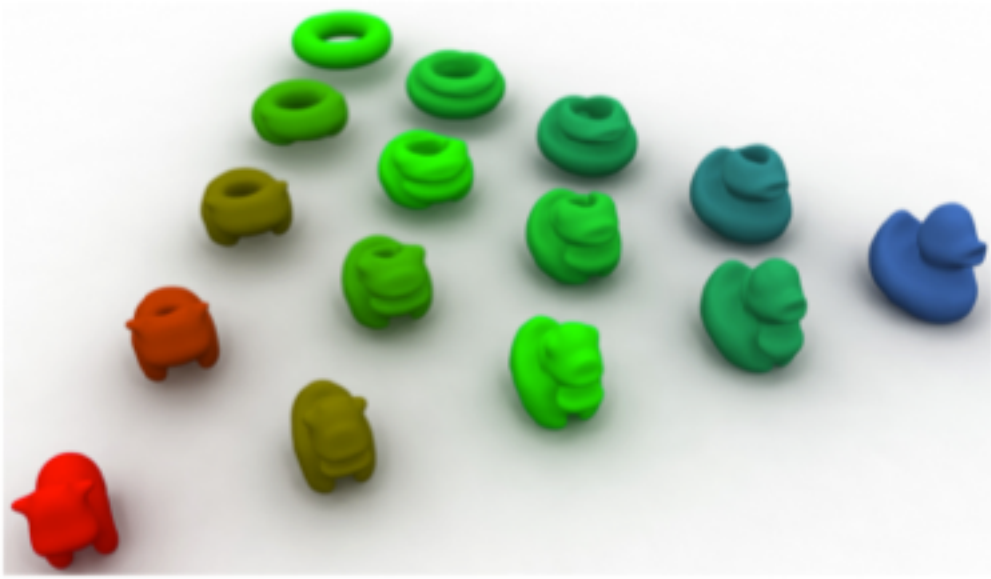
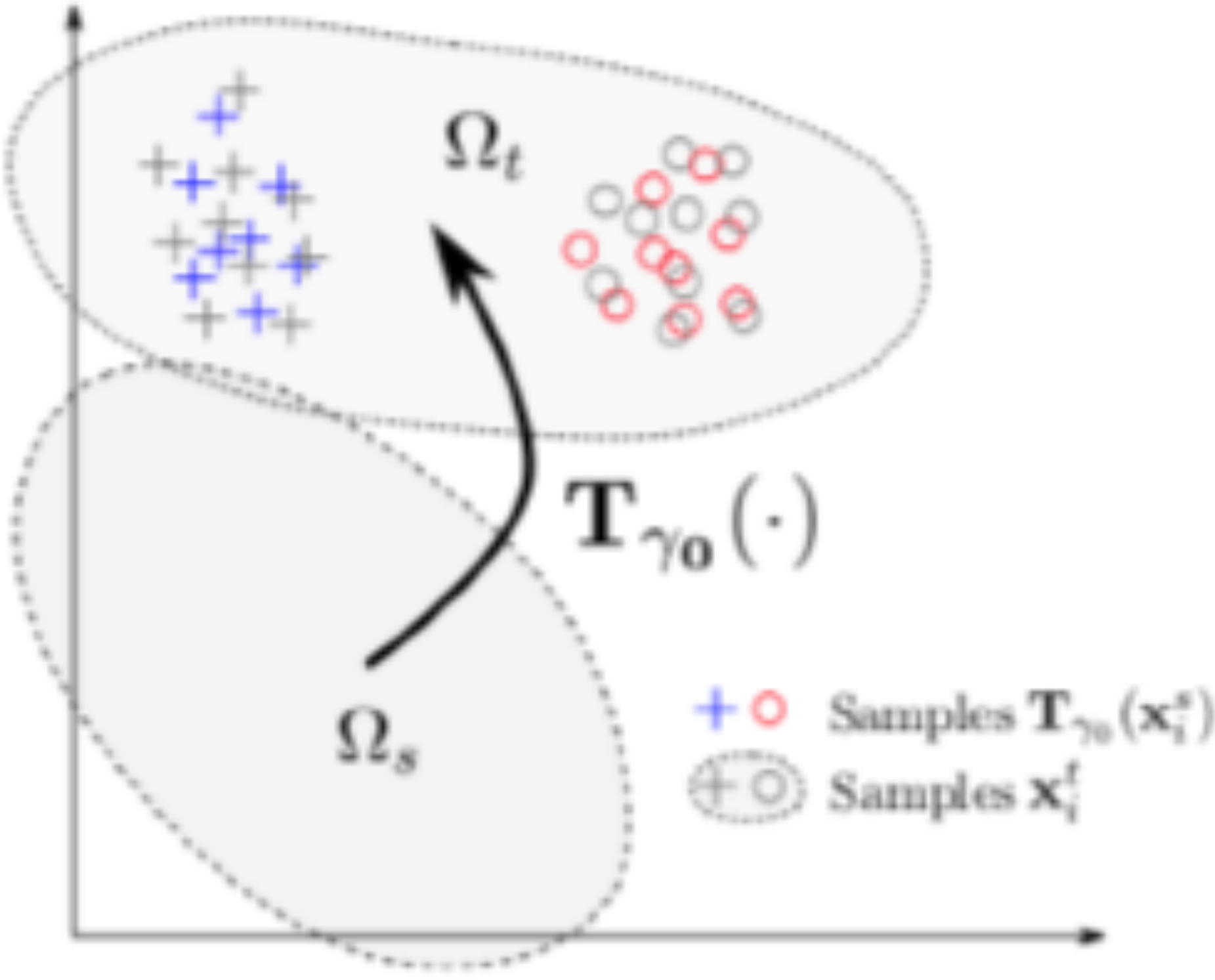


Figure 7: *Shape interpolation in 3D, expanded from Fig. 1.*

Shape registration, interpolation

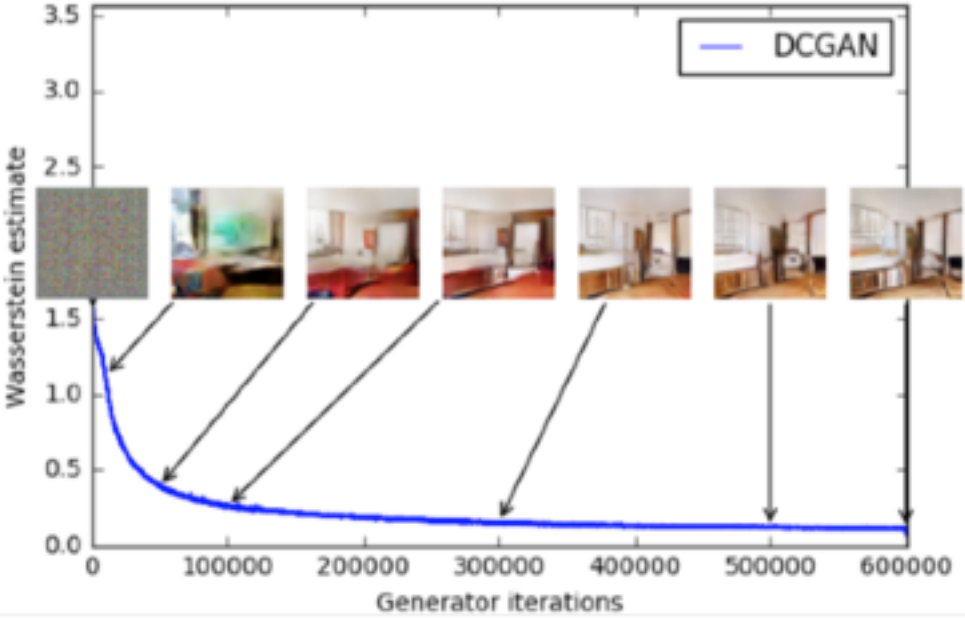
[Gangbo + McCann, 2000; Solomon et al., 2015]

Optimal transport



Domain Adaptation, Classification

[Courty et al., 2017;
Frogner et al., 2015]


DCGAN
Wasserstein estimate
Generator iterations
3.5
3.0
2.5
1.5
1.0
0.5
0.0
0
100000
200000
300000
400000
500000
600000

Generative models

[Arjovsky et al. 2017; Salimans et al., 2018; Genevay et al., 2018]

Optimal Transport
in Machine Learning

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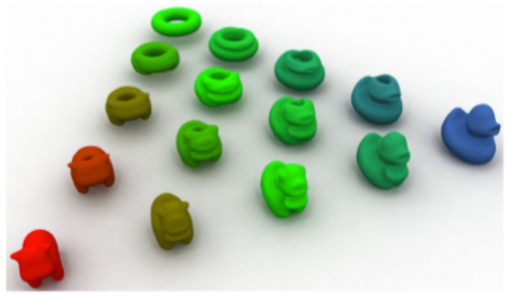

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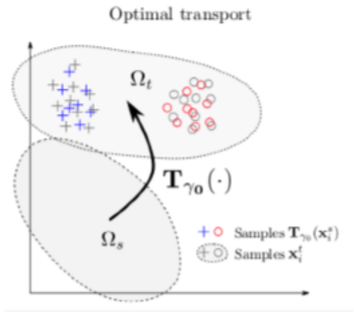

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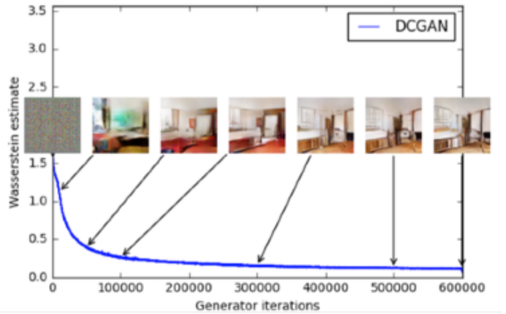

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Optimal Transport
Limitations

- Doesn't incorporate frequently occurring *structural* information