P54 [Massively scalable Sinkhorn distances via the Nyström method](https://arxiv.org/abs/1812.05189)

For the theory, we can go quickly; there's no need to redo the proofs that are already done, just explain the main ideas and the results.

I really think we should carry out quite simple tests, perhaps just on Gaussians, to see the performance of the method and test the impact of parameter choices (especially the rank of the kernel).

It's a bit tricky; we need precise tests where, for example, we observe the estimation of the Sinkhorn cost (or another quantity of interest) in relation to the computation time (which we can estimate theoretically). (Fig.1?) As the rank increases, the algorithm becomes slower but more precise (so there isn't an "optimal" rank; it depends on the time we have).

We can test, for example, in 1D, 2D, 5D (at least in dimensions that aren't too small, but if they're too large, we might not observe anything).

Also, be careful, I think that when epsilon is small, the method will struggle to guarantee the positivity of the kernel, so it may not be stable.

Link with the course

* Sample complexity?
* See the program on website, maybe exercises

Da rileggere

* Schrodinger problem
* Separable kernels and convolution
* Ripetere

Da fare

* Section on complexity ?
* Riguardare le conclusion summary in merito a improvements with respect to previous work
* --------------------------------------------------
* Experiments on Adaptive version at a fixed precision and compare with sinkhorn (critic)
* Show the type of solution maybe sparse of the different rnk (2D) compared to sinkhorn (future work)

Se c’è tempo

* Espandere ROUND

NYS-SINK

Immagine che contiene testo, Carattere, schermata, bianco

Descrizione generata automaticamente

Adaptive Nystrom

Immagine che contiene testo, Carattere, numero, linea

Descrizione generata automaticamente

Synkhorn

Immagine che contiene testo, schermata, Carattere, numero

Descrizione generata automaticamente

Round (fatto)

Immagine che contiene testo, schermata, Carattere, bianco

Descrizione generata automaticamente