📍 Poster session 🗺️

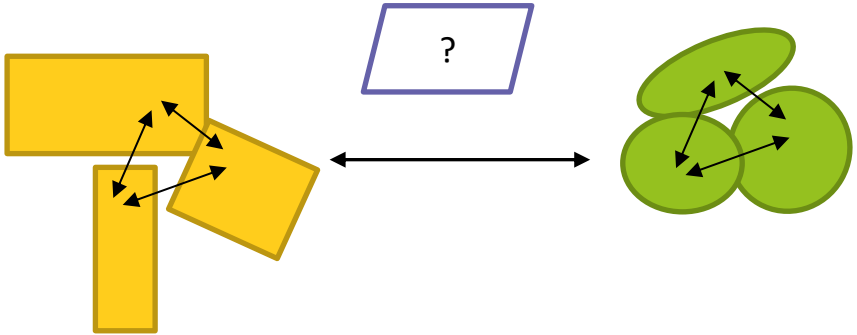
Today from 6-8pm

Hall E #517

Setting & problem statement

- Supervised learning, clustering, retrieval: distances are useful!
- Deformations in the wild: perspective, rotation, translation, …

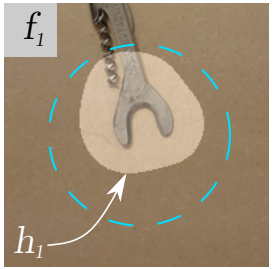
Find a distance between images which is **invariant to smooth diffeomorphisms** and **computable in practice.**

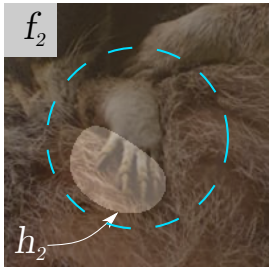


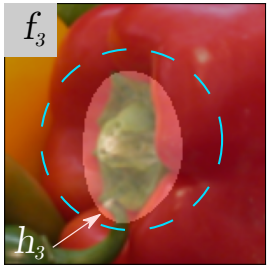
How ? Enforce inductive bias.

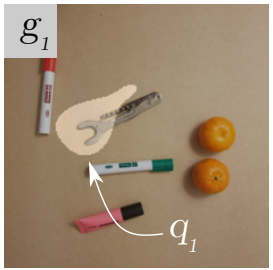
- Labeled data is expensive
- Data augmentation is computationally intensive.

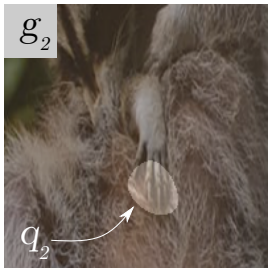
Applied to our examples

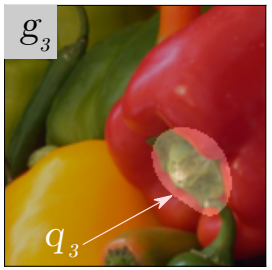






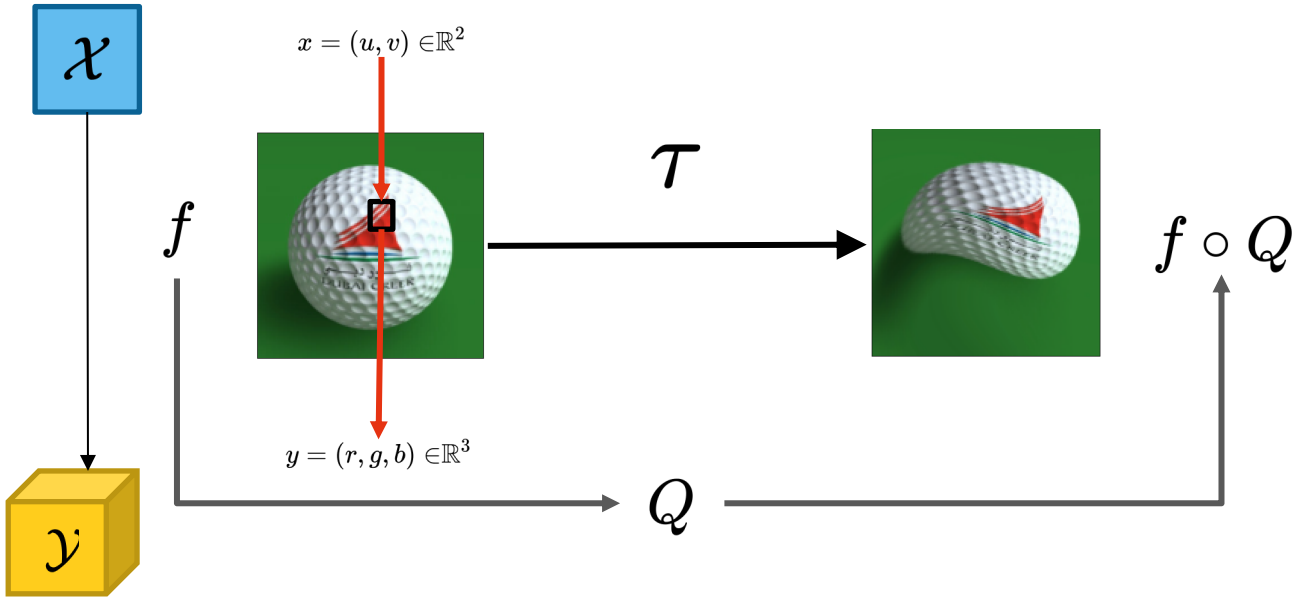






Raccoon credits: Adrien Bukato

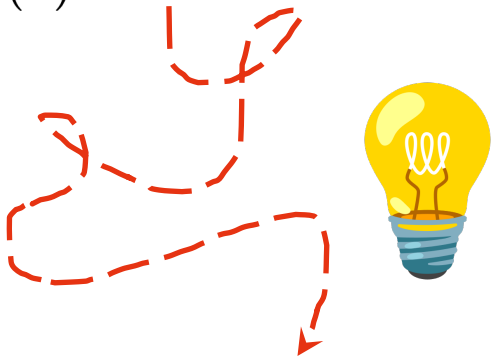
Key idea #1: Seeing images as functions



Key idea #2: change of variable

unknown

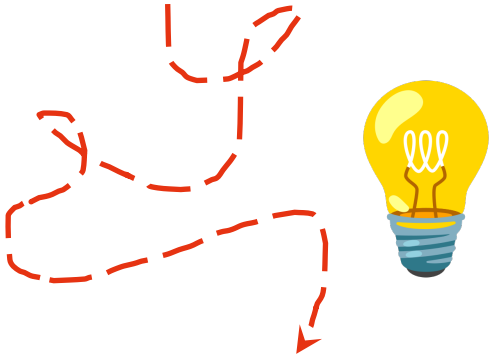
$$\int f(Q(x))|\nabla Q(x)|\mathrm{d}x = \int f(x)\mathrm{d}x.$$



$$D_\lambda(f,g) := \max_{\|h\|_{\mathcal{H}}\leq 1} \min_{q\in\mathcal{H}} \max_{\|v\|_{\mathcal{F}}\leq 1} \left| \int_X v(g(x))q(x)\mathrm{d}x - \int_X v(f(x))\mu(x)h(x)\mathrm{d}x \right|^2 + \lambda\|q\|_{\mathcal{H}}^2$$

Key idea #3: Nyström approximations

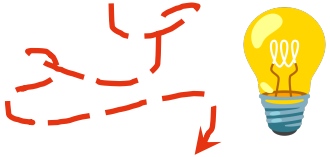
Kernel methods are **expressive** but **expensive** when used naïvely!



Efficient time complexity thanks to **Nyström approximations.**

Come talk to me **Hall E #517 (6-8pm)**

- ❑ **You want to know what is behind the**



- ❑ **You work on invariances in ML.**
- ❑ **You are interested in kernel methods, Nyström approximations, …**
- ❑ **You like (bad) ML memes…**