DEFORMABLE SHAPE CORRESPONDENCE

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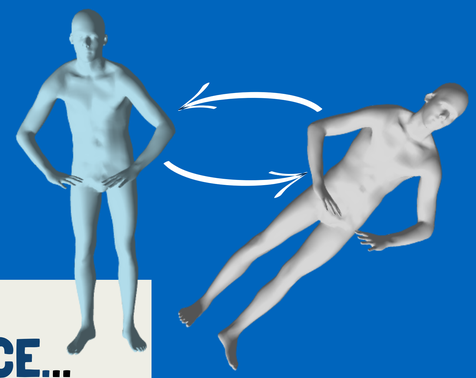
WHY?

Shape correspondence can be used in ***object detection*** and **computational biology**.

-- Example --
Comparing 3D structure of proteins.



A FIRST GLANCE...

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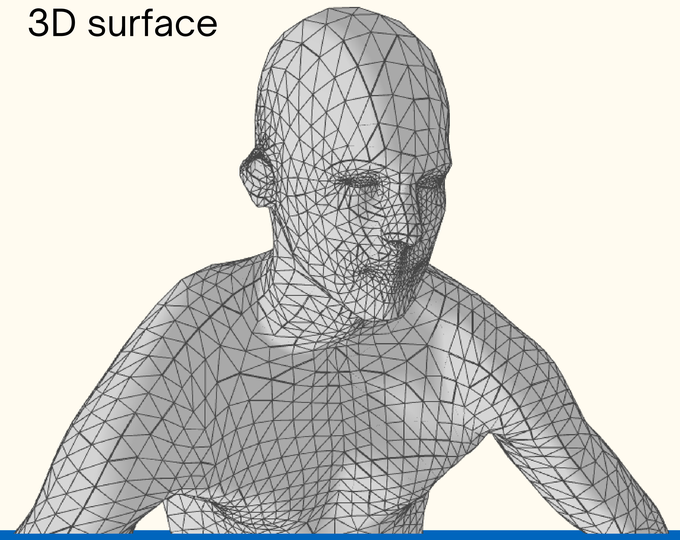
... at the problem:
Find **rotation** to overlap figures

[Solution]
3D rotation matrix

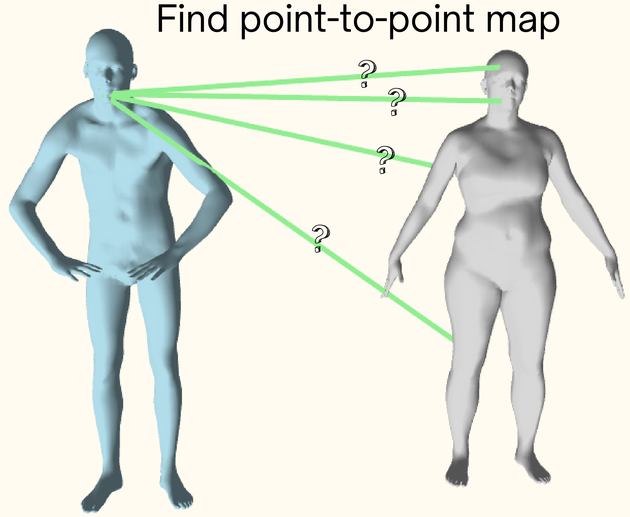
too easy? But...

WHAT IS SHAPE CORRESPONDENCE?

INPUT:
3D surface



GOAL:
Find point-to-point map



FULL PROBLEM

In genereral, correspondence deals with **incomplete, deformed** or even **different objects**

-- Example --
Find correspondence between a cat and a lion

IN CASE YOU'RE INTERESTED IN THE MATH...

We can represent the map between functions on the shapes by a matrix C and **optimize** the problem:

- $\bar{C} = \underset{C}{\operatorname{argmin}} \|CA - B\|^2$

PLAY AROUND YOURSELF

HOW?

We take measurements on points, e. g. temperature, curvature (represented by colour). Our map must transfer this information.

This approach is called
Functional Maps.