We have given an arbitrary 6-dimensional pose of the hand.

r = roll, p = pitch, y = yaw

We have a dataset with a total of *N* 6-dimensional poses of the hand at task *k* and time step *t*.

We already found a function g that calculates the elbow angle for a given pose :

Ultimately, we want to find a function f that calculates the elbow angle for an arbitrary pose:

where

and

Here, is a distance function, i.e. it is 0 if is equal to , and >0 otherwise.

Our goal is to implement the distance function

where is the angle of the rotation between world frame and in angle axis representation, and is a weighting parameter that has to be determined based on our experiments.

Matlab: Rotation Matrix to Axis Angle Representation:

<https://www.mathworks.com/help/robotics/ref/rotm2axang.html>