HA #1

The following diagram is from Lecture Note W12-L2-1.

A picture containing person, indoor, preparing

Description automatically generated

Our goal for this question is to find the transformation between the DRF1 and the tip of the ND, which is denoted as in the figure above. and are given according to the question statement. Also, we know the transformation between the frame and the camera frame, , and the transformation between the frame and the camera frame, . Thus, we know the transformation between them, denoted by . By defining the unknown transformation to be the transformation between the frame and the frame, we have the following equation

Assuming we have measurements,

The unknown transformation can be expressed as

Plugging in the above equation to the governing equation, we have

Rearranging the above equation, we have

This is in the form of , thus we can solve for using the technique we learned in class.