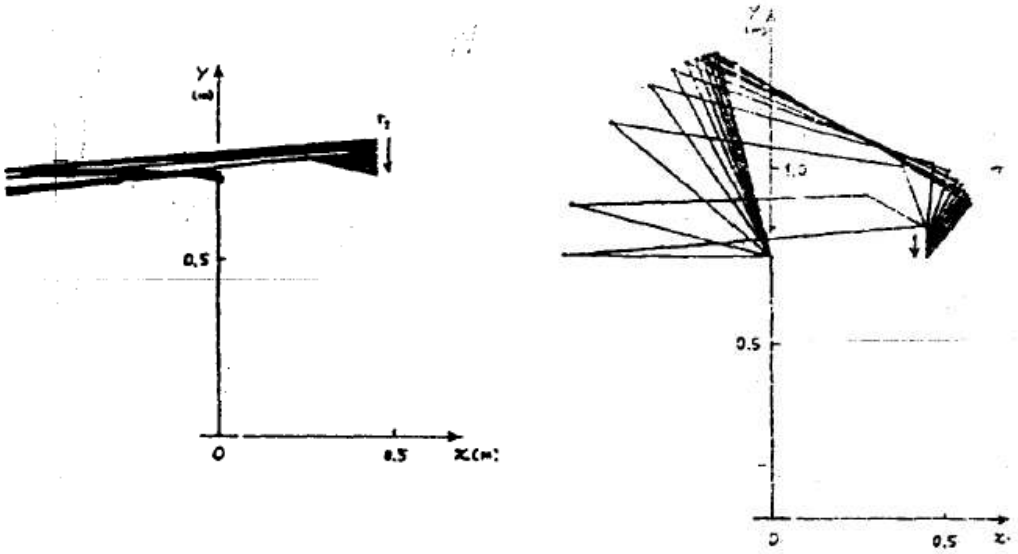
MMC HW5

1. (Kinematic Redundancy)

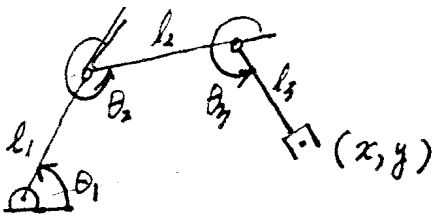
Referred to the Yoshikawa's paper uploaded in class material,

Select the singularity avoidance scheme as a redundancy utilization scheme

Redo this problem with a simple 3 DOF robot below and show the effectiveness of your scheme by simulation like



2. (Kinematic Calibration)



$$l_1\cos\theta_1 + l_2\cos\theta_{12} + l_3\cos\theta_{123} = x$$

$$l_1\sin\theta_1 + l_2\sin\theta_{12} + l_3\sin\theta_{123} = y$$

Shown a manipulator, $l_1 = l_2 = l_3 = 1$ is known.

but the real link length are $l_1 = l_2 = l_3 = 0.95$, other kinematic parameters are correct. perform Kinematic Calibration process for 3 link lengths

Hint: X_{real} = $X_{measured}$ is computed with real link lengths

$X_{computed}$ is computed with the known lengths