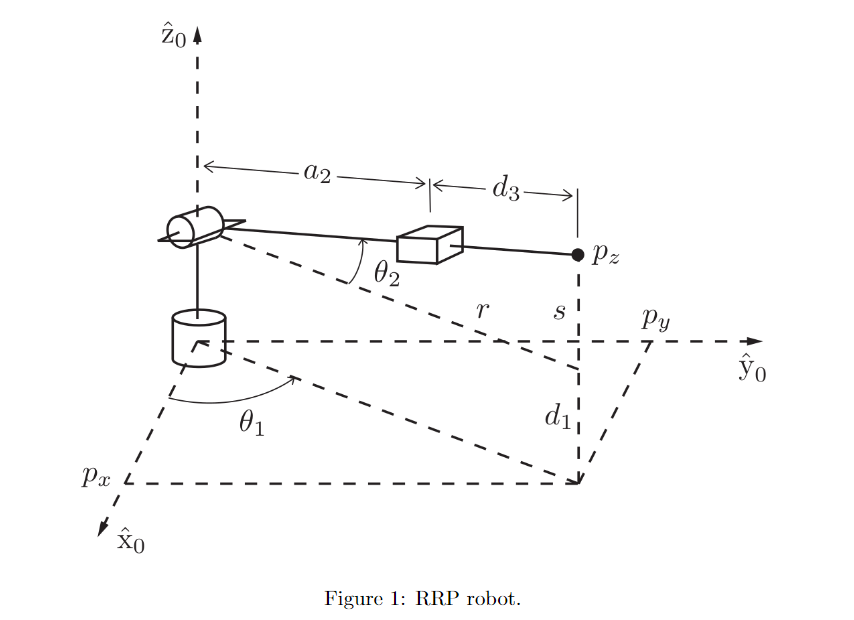
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Dynamics of non-linear Robotics

Homework 3 Report



The Forward kinematic model:

The inverse kinematics solution:

We have 4 solutions for the position of the robot since d3 can be both positive and negative so we have to take that in account.

The 1st solution:

The 2nd solution:

The 3rd solution:

The 4th solution:

The Jacobian

Numerical method:

Extract the rotation matrix from the Forward kinematics

Get the inverse of the rotation matrix

The full Jacobian matrix:

J = [

The Skew theory method:

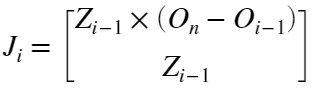
/\* Corresponds to rotation around Z axis \*/

/\* Corresponds to rotation around Y axis \*/

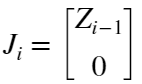
/\* Corresponds to translation along X axis \*/

Full Jacobian

for revolute joint:



for prismatic joint:



The full Jacobian matrix

J = [