Department of Computer Science and Engineering

Course Code: CSE461	Credits: 1.5
Course Name: Introduction to Robotics Lab	Semester: Summer '24

Lab 4

Introduction to robot kinematics

Forward Kinematics:

1. DH Parameter Process : Class Note
2. Trigonometry : Class note

DH Parameter Process Code:

```
from math import cos as c

from math import sin as s

import math

import numpy as np



np.set_printoptions(suppress=True)



def dh_matrix(a,d,alpha,theta):



  dh = [[c(theta), -c(alpha)*s(theta), s(alpha)*s(theta), a*c(theta)],
        [s(theta), c(alpha)*c(theta), -s(alpha)*c(theta),
```

```
        a*s(theta)], [0, s(alpha), c(alpha), d],

        [0,0,0,1]

        ]


  return np.array(dh)



T1 = df_matrix(20,0,math.radians(0),math.radians(30))

T2 = df_matrix(32,0,math.radians(0),math.radians(45))

T3 = df_matrix(10,0,math.radians(0),math.radians(10))


print("Forward solution:")

print("T1")

print(T1)

print("T2")

print(T2)

print("T3")

print(T3)


print("Overall")

print(np.dot(np.dot(T1,T2), T3))
```