# **Rotation matrix**

* <https://youtu.be/wg9bI8-Qx2Q?si=bvU_12tCUw35owhX>
* <https://youtu.be/09I15RO49vg?si=4XWlYP3FmEWRYnLV>

# **Forward Kinematic with DH convention mathematical calculation**

Highly recommend

* <https://youtube.com/playlist?list=PLI_ZVs3jy155t5XanVuvsTlQynBaG_l0r&si=z11UUu4XSylbetcC> **(Forward kinematic with Denavit hartenberg)**
* <https://youtu.be/BkMQ5Rek_vM?si=JvVn6FviT6OkuIsd> **(Forward kinematic)**
* <https://youtu.be/EzNAs2w1cS0?si=K5UVABubQHQrvg0y> **(Forward kinematic)**
* <https://youtu.be/EzNAs2w1cS0?si=Pg3E6OanbzL6g15v> **(Denavit hartenberg)**
* <https://youtu.be/Poy1uUbFgW4?si=9M4nOh2zoxkM2EEy> **(Denavit hartenberg)**

1. **Inverse kinematic with DH convention mathematical calculation**

* <https://youtu.be/hEQ1p2WffmA?si=rEYvEdcn7fw64A0e>
* <https://youtu.be/wmE1KQJmzVM?si=YIIMqD1uPjWHWYa7>
* <https://youtu.be/pgeJ2M4fuHw?si=ZHUNGe8xSFQJ6XeI>

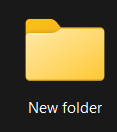
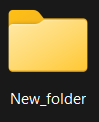
# **Simscape**

* <https://youtu.be/ssHDF_4baJ0?si=LWVct9GiC07euopa> **(Forward Kinematic)**
* [**https://youtu.be/\_8YCc3pJDPI?si=lo3T5Kn3jjzvBGrq**](https://youtu.be/_8YCc3pJDPI?si=lo3T5Kn3jjzvBGrq) **(using Simscape toolbox)**
* [**https://youtu.be/20ENJ7jOJzE?si=22e7x4rbkOA\_JpkK**](https://youtu.be/20ENJ7jOJzE?si=22e7x4rbkOA_JpkK) **(using inverse kinematic)**
* [**https://youtu.be/xB5epLnoURM?si=Mwee4BO\_VF-JPqYM**](https://youtu.be/xB5epLnoURM?si=Mwee4BO_VF-JPqYM) **(Trajectory)**
* [**https://youtu.be/qku7HLpwFLM?si=SXJ0NNPLQC8dh\_Zq**](https://youtu.be/qku7HLpwFLM?si=SXJ0NNPLQC8dh_Zq) **(PID Controller)**
* [**https://youtu.be/m4iRqmrkBqY?si=Q-Zqje8BvIGtfIU9**](https://youtu.be/m4iRqmrkBqY?si=Q-Zqje8BvIGtfIU9) **(PID Controller)**

# **To run the Hardware testing Simulink**

1. Create a folder or subfolder name with **nospace** and try to put all file m file or Simulink file in the **same folder**.

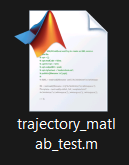
Example:

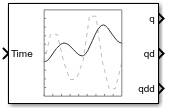
**Correct**

**Wrong**

1. Run the trajectory creation file in **“Trajectory\_matlab\_test.m”.**



1. You can modify what inside the “Trapezoidal Velocity Profile Trajectory “as mean that you can create your own trajectory, then choose you own velocity, end time or acceleration.

**Inside our Trapezoidal velocity profile Trajectory**

**Trapezoidal velocity profile Trajectory**