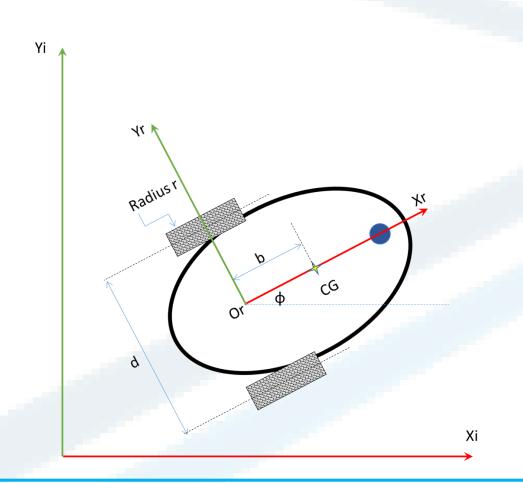
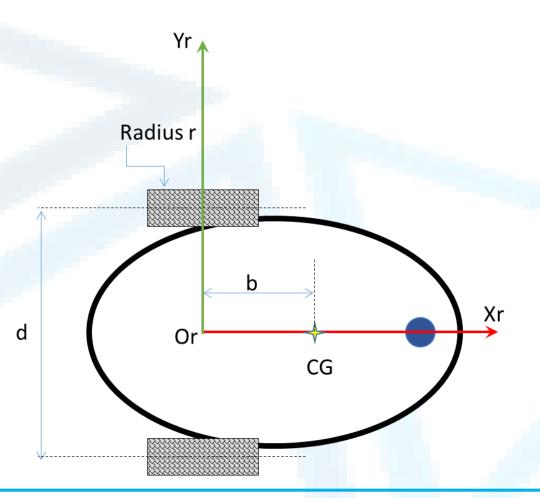


## WMR Dynamic model

Exercise









## جَامِعة الْمَـنَارِة Find the dynamic model of the robot:

- There is a linear friction in the wheels
- Same friction coefficient ß
- The center of gravity of the robot **CG** does not coincide with the wheels midpoint **Or**
- ullet The wheel-motor assemblies have a non-zero inertia  $I_0$

• Result: 
$$\mathbf{D}\ddot{oldsymbol{ heta}} + oldsymbol{eta}\dot{oldsymbol{ heta}} = oldsymbol{ au} egin{dcases} D \in R^{2 imes 2} \ oldsymbol{ heta} = [oldsymbol{ heta}_r & oldsymbol{ heta}_l]^T \ oldsymbol{ au} = [oldsymbol{ au}_r & oldsymbol{ au}_l]^T \end{pmatrix}$$



## Thanks

Think about MATLAB SIMULINK to validate the resultant model