

Multi input control of car lateral dynamics with Torque vectoring and active steering (thesis @ POLIMI, refer to Ing. Vignati and Prof. Sabbioni)

In electric vehicles, the possibility of using distributed motors, i.e. to have more than one motor, e.g. one per each wheel, allows to generate different forces on right and left side of the car thus generating a yaw moment that improves the performances of the car. This effect called torque vectoring enhances the cornering performance and the stability of the car by changing its passive characteristic. Rear active steering can be an alternative for the control of the car attitude while cornering. I.e. by controlling the steering angle of the rear axle is it possible in fact to change the rear cornering force thus changing the car characteristics. Combining the two controllers can lead to some benefits but the coordination between the two controllers must be correctly designed. The aim of the thesis is to study the effect of the two controllers and design a suitable control strategy that takes the advantages of the two systems. (the knowledge provided by the course on vehicle dynamics and control A or B is mandatory)