

CHAPTER 5

CONCLUSION

In this thesis, we study a problem of asymptotically stabilizing a switched system which consists of three second-order linear time invariant (LTI) subsystem. The subsystem used in this thesis have complex eigenvalues where two subsystem have positive real part and one subsystem has negative real part. From the previous with the two unstable foci subsystems cannot be stabilized by a switching law [7]. Therefore, we propose a sufficient condition to stabilize the switched system by finding another subsystem along with a new switching law to guarantee overall switched system to be asymptotically stabilizable. The main result is summarized as follow:

Theorem 3.0.1. Let $\alpha_i \pm j\beta_i$ be eigenvalues of A_i defined in (3.1) and (3.2). The autonomous switched system (3.3) consisting of three subsystems is asymptotically stabilizable if

$$\frac{\alpha_3(\theta_2 - \theta_3)}{\beta_3} < -\frac{\alpha_1\theta_1}{\beta_1} - \frac{\alpha_2(\theta_1 - \theta_2)}{\beta_2} - \ln \sqrt{\cos^2(\theta_1) + E^2 \sin^2(\theta_1)} - \ln c$$

where $\theta_1 + \theta_2 + \theta_3 = \pi$ and $c > 1$.