

# Some relationships between robust and adaptive controllers

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## Abstract

In this talk we discuss results which relate the conservatism of a-priori uncertainty bounds to the performance of classes of robust and adaptive controllers as measured by non-singular transient cost functionals. By concentrating largely on scalar systems we give several techniques for computing upper and lower performance bounds for non-optimal controllers, and use these results to prove when classes of adaptive controllers outperform robust controllers and vice-versa. One consequence of the results is to prove that (in a precise sense) adaptive controllers for linear systems are necessarily nonlinear and dynamic. Finally we apply the techniques to two classes of “robust adaptive” controllers, and compare their performance.