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Sommario/riassunto	Long description: In this thesis we are concerned with the robustness analysis and control of uncertain systems. We built upon a powerful framework, the so-called integral quadratic constraint (IQC) approach, which enables us, not only to efficiently perform robust stability and performance analysis for a large class of uncertain systems, but also to systematically design robust controllers via solving linear matrix inequalities (LMIs) and convex optimization problems. Indeed, as main contribution, we reveal that the IQC-framework is not only useful for analysis purposes, but also has great potential for a rather diverse class of synthesis questions, some of which have already been addressed in the literature, while others have not. This includes scenarios such as nominal output feedback control, nominal gain-scheduling control, robust estimator or observer design, robust feedforward control, generalized l2-synthesis, multi-objective and structured controller synthesis, robust open-loop controller synthesis, gain-scheduling control with uncertain performance weights and robust controller synthesis with unstable weight, among others.