Control by dynamic programming: robust stability guarantees

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Résumé

This PhD thesis aims to develop methods for synthesizing stabilizing, robust, and (near-)optimal control laws for nonlinear systems using dynamic programming. While dynamic programming is effective for general system dynamics and cost functions, it lacks inherent stability and robustness guarantees. The work focuses on refining algorithms to ensure robust stability, including input-to-state and LpL_p stability, addressing real-world challenges and extending recent results on stability and robustness under disturbances and noise. The first problem is to ensure a detectability property essential for the future following works.

Mots-Clés: Dynamic programming, Lyapunov stability, robustness, dissipativity, input, to, state stability, detectability

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