Hamilton Institute

Performance Limitations in Formation Control of Autonomous Vehicles with limited Communications

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Abstract

The study of performance limitations in feedback control systems has a long history, being best established in the case of linear time invariant systems. One aspect of this is trade-offs for single input single output feedback systems with a type II servo response. In this case, there are complex analytic results, analogous to the Bode Sensitivity Integral, that apply to the complementary sensitivity function. These results have previously been applied to studies of distributed control of autonomous vehicles. In some special cases, namely, homogeneous systems, with nearest neighbour communications, these results can be used to establish conditions under which a phenomenon known as "string instability" is guaranteed to occur. In this talk, I will review this background; show some extensions to the results for heterogeneous systems; and give some preliminary results and conjectures for non-nearest neighbour communications.

Venue: Seminar Room, Hamilton Institute, Rye Hall,
NUI Maynooth

Time: 2.00 - 3.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

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