

## **Contraction analysis**

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Lyapunov's theory is an essential tool for stability analysis of dynamical systems. The talk will provide an analog theorem for incremental stability analysis. This stronger notion of stability focuses on convergence between every pair of solutions of a dynamical system, and it is significant in applications like regulation, filtering, and synchronization. The proposed approach develops a local analysis of solutions (i.e. in the tangent space) through the introduction of Finsler metrics. Exploiting the analogy between Finsler metrics and Lyapunov functions - a Finsler metric resembles a Lyapunov function "lifted" to the tangent space - we provide sufficient Lyapunov-like conditions for the "contraction" of the metric along solutions curves. Incremental stability is then inferred by integration.