

**Aquitaine –Karnataka collaboration
Scientific Project for Pre-PhD student exchange**

Scientific Proposal

Project Title	Stability Studies of Multi-Agent Dynamical Systems	
Scientific domain	Control System, Dynamical System	
Summary (ca. 10 lines)	Study of multi-agent dynamical systems has emerged as one of the important research areas in the field of control systems. The key research questions are related to synchronization, swarming, consensus, control, data fusion, and stability. The impact of network connectivity on performance of the multi-agent system needs to be investigated for the effective configuration. In this context, the purpose of this internship is to study the network connectivity on the stability of the overall multi-agent system. There are cases where unstable systems can be networked together to reach a stable configuration. Suitable adaptive laws have to be investigated. The study will be carried out by considering first, second, and third order dynamical systems for agents in a progressive manner. The internship includes both analytical and simulation studies.	
Student profile wished	Foundational Ideas of Control Systems and Flair for Analytical and Simulation Studies	
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Director Name Institute/laboratory/industry	Dr. H.K. Narahari	
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Timing & duration for project (give approximate ranges)	4 to 6 Months	
Representative References	Narendra, K. S., & Harshangi, P. (2014, June). Unstable Systems Stabilizing each other through Adaptation. In American Control Conference (ACC), 2014 (pp. 7-12). IEEE.	

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