Hybrid Formation Control of Multi-Agent Systems

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Abstract - As one of the most significant issues in the distributed coordination of multi-agent systems, formation control has received increased attention in recent years due to its wide applications in satellite formation flying, exploration, surveillance and rescue. The formation control problem aims to design suitable protocols such that a group of agents can reach a desired geometric structure from arbitrary initial positions. This talk discusses multi-group formation and tracking control of multi-agent systems with multiple leaders. Hybrid protocols are proposed to take into consideration of continuous communications among agents and intermittent information exchanges on a sequence of discrete times. It is shown, by employing results from graph theory and dynamical systems, that agents may be divided into multiple subgroups to follow different leaders while maintaining desired sub-formation configurations.