Dissertation for Doctor of Philosophy

Distributed Formation Control of Multi-agent Systems: Bearing-based Approaches and Applications

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Distributed Formation Control of Multi-agent Systems: Bearing-based Approaches and Applications

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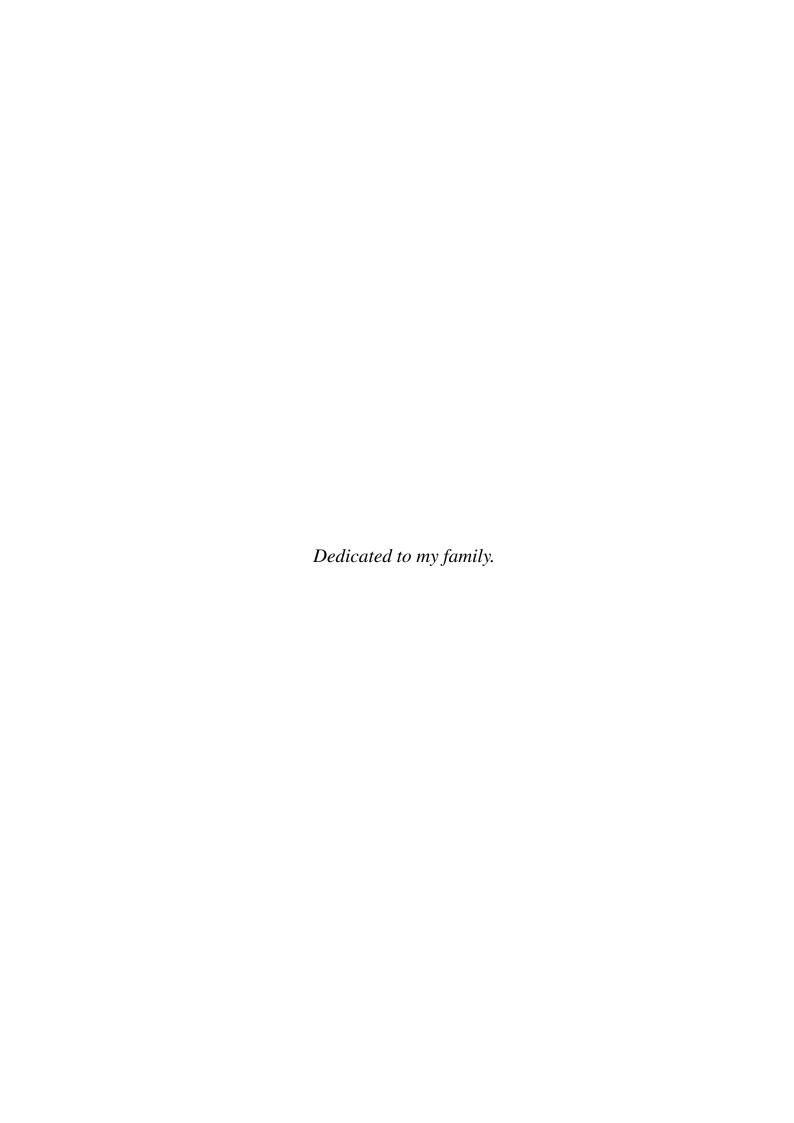Approved by

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Dedicated to my family.

Abstract

This thesis studies formation control of multi-agent systems with bearing-based ap-
proaches. First, formations with two types of directed graphs namely the leader-first fol-
lower and directed cycle are studied in detail. Second, some further results in designing
bearing-only control laws are reported. Third, the multi-agent pointing consensus problem
is formulated. Solution of this problem is proposed and proved to be effective. Finally,
this thesis proposes and investigates the concept of consensus with matrix weights and their
applications.

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