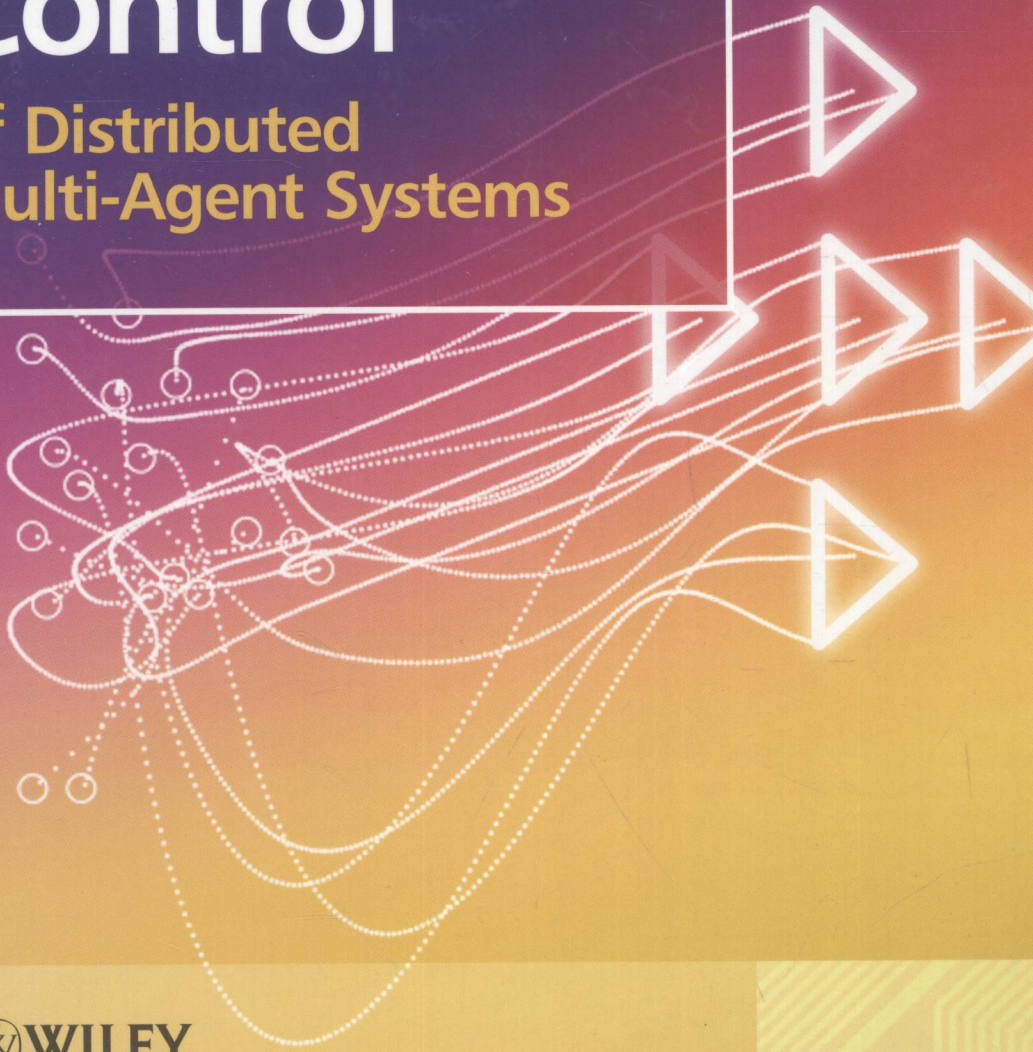


Edited by
Jeff S. Shamma

Cooperative Control

of Distributed
Multi-Agent Systems



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Jeff S. Shamma

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Cooperative Control of Distributed Multi-Agent Systems

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Preface

Cooperative control involves a collection of decision-making components with limited processing capabilities, locally sensed information, and limited inter-component communications, all seeking to achieve a collective objective. Examples include autonomous vehicle teams, mobile sensor networks, data network congestion control and routing, transportation systems, multi-processor computing, and power systems. The distributed nature of information processing, sensing, and actuation makes these applications a significant departure from the traditional centralized control system paradigm.

There has been substantial and increasing interest in recent years in cooperative control systems. Indications of the level of interest include several multi-year/multi-university research projects, calls for proposals, journal special issues, and specialty conferences.

This volume represents an effort to recognize certain themes that have emerged from recent cooperative control research. The themes, or ‘dimensions’, we will use are: (1) Distributed control and computation; (2) Adversarial interactions; (3) Uncertain evolution; and (4) Complexity management. Of course, these themes do not constitute a ‘partition’ of cooperative control research, and alternative headings could have been used. Furthermore, research results typically fall under more than one dimension. Nonetheless, it is instructive to impose some structure on the broad scope of research that has emerged in cooperative control.

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Jeff S. Shamma

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Part I

Introduction

