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Sommario/riassunto

Autonomous underwater vehicles (AUVs) are emerging as a promising solution to help us explore and understand the ocean. The global market for AUVs is predicted to grow from 638 million dollars in 2020 to 1,638 million dollars by 2025 a compound annual growth rate of 20.8 percent. To make AUVs suitable for a wider range of application-specific missions, it is necessary to deploy multiple AUVs to cooperatively perform the localization, tracking and formation tasks. However, weak underwater acoustic communication and the model uncertainty of AUVs make achieving this challenging. This book presents cutting-edge results regarding localization, tracking and formation for AUVs, highlighting the latest research on commonly encountered AUV systems. It also showcases several joint localization and tracking solutions for AUVs. Lastly, it discusses future research directions and provides guidance on the design of future localization, tracking and formation schemes for AUVs. Representing a substantial contribution to nonlinear system theory, robotic control theory, and underwater acoustic communication system, this book will appeal to university researchers, scientists, engineers, and graduate students in control theory and control engineering who wish to learn about the core principles, methods, algorithms, and applications of AUVs. Moreover, the practical localization, tracking and formation schemes presented provide guidance on exploring the ocean. The book is intended for those with an understanding of nonlinear system theory, robotic control theory, and underwater acoustic communication

systems.