Contents

Part I Vehicle Navigation Systems

Observers for Position Estimation Using Bearing and Biased Velocity Information .......................................... 3
Florent Le Bras, Tarek Hamel, Robert Mahony and Claude Samson

Nonlinear Camera- and GNSS-Aided INS for Fixed-Wing UAV Using the eXogenous Kalman Filter ............................... 25
Lorenzo Fusini, Thor I. Fossen and Tor Arne Johansen

Motion Control of ROVs for Mapping of Steep Underwater Walls ................................................................. 51
Stein M. Nornes, Asgeir J. Sørensen and Martin Ludvigsen

Part II Localization and Mapping

Underwater 3D Laser Scanners: The Deformation of the Plane ........ 73
Albert Palomer, Pere Ridao, David Ribas and Josep Forest

Advances in Platforms and Algorithms for High Resolution Mapping in the Marine Environment ............................. 89
R. Thomas Sayre-McCord, Chris Murphy, Jeffrey Kaeli, Clayton Kunz, Peter Kimball and Hanumant Singh

New Design Techniques for Globally Convergent Simultaneous Localization and Mapping: Analysis and Implementation ........ 121
Pedro Lourenço, Bruno Guerreiro, Pedro Batista, Paulo Oliveira and Carlos Silvestre

Pose-Graph SLAM for Underwater Navigation ................................. 143
Stephen M. Chaves, Enric Galceran, Paul Ozog, Jeffrey M. Walls and Ryan M. Eustice
Exploring New Localization Applications Using a Smartphone ........ 161
Fredrik Gustafsson and Gustaf Hendeby

Part III  Path Planning

Model-Based Path Planning ........................................ 183
Artur Wolek and Craig A. Woolsey

Constrained Optimal Motion Planning for Autonomous
Vehicles Using PRONTO ........................................... 207
A. Pedro Aguiar, Florian A. Bayer, John Hauser, Andreas J. Häusler,
Giuseppe Notarstefano, Antonio M. Pascoal, Alessandro Rucco
and Alessandro Saccon

Part IV  Sensing and Tracking Systems

Observability-Based Sensor Sampling ............................ 229
Kristi A. Morgansen and Natalie Brace

Tracking Multiple Ground Objects Using a Team of Unmanned
Air Vehicles ........................................................... 249
Joshua Y. Sakamaki, Randal W. Beard and Michael Rice

A Target Tracking System for ASV Collision Avoidance Based
on the PDAF ............................................................ 269
Erik F. Wilthil, Andreas L. Flåten and Edmund F. Brekke

Detection and Tracking of Floating Objects Using a UAV
with Thermal Camera ............................................... 289
Håkon Hagen Helgesen, Frederik Stendahl Leira, Tor Arne Johansen
and Thor I. Fossen

Part V  Identification and Motion Control of Robotic Vehicles

Experimental Identification of Three Degree-of-Freedom Coupled
Dynamic Plant Models for Underwater Vehicles ................. 319
Stephen C. Martin and Louis L. Whitcomb

Model-Based LOS Path-Following Control of Planar Underwater
Snake Robots ......................................................... 343
Anna M. Kohl, Eleni Kelasidi, Kristin Y. Pettersen
and Jan Tommy Gravdahl

Robotized Underwater Interventions .............................. 365
Giuseppe Casalino, Enrico Simetti and Francesco Wanderlingh
Adaptive Training of Neural Networks for Control of Autonomous Mobile Robots ........................................ 387
Erik Steur, Thijs Vromen and Henk Nijmeijer

Modeling, Identification and Control of High-Speed ASVs: Theory and Experiments ............................................. 407
Bjørn-Olav Holtung Eriksen and Morten Breivik

Part VI Coordinated and Cooperative Control of Multi-vehicle Systems

From Cooperative to Autonomous Vehicles ................................. 435
Tom van der Sande and Henk Nijmeijer

Coordination of Multi-agent Systems with Intermittent Access to a Cloud Repository ........................................ 453
Antonio Adaldo, Davide Liuzza, Dimos V. Dimarogonas and Karl H. Johansson

A Sampled-Data Model Predictive Framework for Cooperative Path Following of Multiple Robotic Vehicles ......................... 473
A. Pedro Aguiar, Alessandro Rucco and Andrea Alessandretti

Coordinated Control of Mobile Robots with Delay Compensation Based on Synchronization ..................................... 495
Yiran Cao and Toshiki Oguchi

Erratum to: New Design Techniques for Globally Convergent Simultaneous Localization and Mapping: Analysis and Implementation .................................. E1
Pedro Lourenço, Bruno Guerreiro, Pedro Batista, Paulo Oliveira and Carlos Silvestre

Index ................................................................. 515
Sensing and Control for Autonomous Vehicles
Applications to Land, Water and Air Vehicles
Fossen, T.I.; Pettersen, K.Y.; Nijmeijer, H. (Eds.)
2017, IX, 518 p. 212 illus., 170 illus. in color., Hardcover
ISBN: 978-3-319-55371-9