AUTHOR INDEX

Abdulrahim, K., Hide, C., Moore, T. and Hill, C. Aiding Low Cost Inertial Navigation with Building Heading for Pedestrian Navigation . . . 219
Ahn, Y. J., Cui, J. and Hoffmann, C. Circle Approximations on Spheroids . . . 739
Alonso, J., Milanés, V., Onieva, E., Pérez, J., González, C. and de Pedro, T. Cartography for Cooperative Manoeuvres with Autonomous Land Vehicles . . . 141
Ariff, O. K. and Go, T. H. Waypoint Navigation of Small-Scale UAV incorporating Dynamic Soaring . . . 29
Baniela, S. I. and Ríos, J. V. Maritime Safety Standards and the Seriousness of Shipping Accidents 495
Blanchard, W. The Beginnings of Air Radio Navigation and Communication . . . 571
Blanchard, W. The Deployment of Overseas GEE Chains in 1945/46 . . . 751
Brooker, P. Air Traffic Control Separation Minima: Part 1 – The Current Stasis . . . 449
Brooker, P. Air Traffic Control Separation Minima: Part 2 – Transition to a Trajectory-based System . . . 673
Chan, F-C. and Pervan, B. High-Integrity GPS/INS Integrated Navigation with Error Detection and Application to LAAS . . . 467
Chauvin, C. Human Factors and Maritime Safety . . . 625
Chen, W., Chen, R., Chen, X., Zhang, X., Chen, Y., Wang, J. and Zhongqian. Comparison of EMG-based and Accelerometer-based Speed Estimation Methods in Pedestrian Dead Reckoning . . . 265
Debnath, A. K., Chin, H. C. and Haque Md.M. Modelling Port Water Collision Risk Using Traffic Conflicts . . . 645
Deng, H., Pan, C., Wen, T. and Liu, J. Entropy Flow-Aided Navigation . . . 109
Ding, W. and Wang, J. Precise Velocity Estimation with a Stand-Alone GPS Receiver . . . 311
Earle, M. A. Accurate Harmonic Series for Inverse and Direct Solutions for the Great Ellipse . . . 557
Efatmaneshnik, M., Kealy, A., Balaei, A. T. and Dempster, A. G. Information Fusion for Localization Within Vehicular Networks . . . 401
Groves, P. D. Shadow Matching: A New GNSS Positioning Technique for Urban Canyons . . . 417
Han, S. and Wang, J. A Novel Method to Integrate IMU and Magnetometers in Attitude and Heading Reference Systems . . . 727
Holder, E. and Pecota, S. R. Maritime Head-Up Display: A Preliminary Evaluation . . . 573
Hui, D. and Xin, L. The Asian Monsoons and Zheng He's Voyages to the Western Ocean . . . 207
Jiménez, F. and Naranjo, J. E., García, F. and Armingol, J. M. Can Low-Cost Road Vehicles Positioning Systems Fulfill Accuracy Specifications of New ADAS Applications? . . . 251
Karimi, H. A., Roongpiboonsopit, D. and Kasemsuppakorn, P. Uncertainty in Personal Navigation Services . . . 341
Kemp, J. Coastal Navigation in the Mid-20th Century . . . 533
Kendal, B. The Beginnings of Air Radio Navigation and Communication . . . 157
Kinzo, I. Maritime Community and its Human Resource Mobility . . . 633
Lapinski, A-L. S. and Isenor, A. W. Estimating Reception Coverage Characteristics of AIS . . . 609
Lee, J. K. and Jekeli, C. Rao-Blackwellized Unscented Particle Filter for a Handheld Unexploded Ordnance Geolocation System using IMU/GPS . . . 327
Li, B., Zhang, J., Dempster, A. G. and Rizos, C. Open Source GNSS Reference Server for Assisted-Global Navigation Satellite Systems . . . 127
Lo, V. E-W., Green, P. A. and Franzblau, A. Where Do People Drive? Navigation System Use by Typical Drivers and Auto Experts . . . 357
Loegering, G. S. The Global Hawk/BAMS Navigation System; an Update to the Odyssey . . . 15
Mills, S. Watch-Keeping on Fishing Vessels: Can Electronic Marine Systems Help? . . . 521
Milner, C. D. and Ochieng, W. Y. Weighted RAIM for APV: The Ideal Protection Level . . . 61
Milner, C., Ochieng, W., Schuster, W., Porretta, M. and Curry, C. A Regional Space Segment Health Monitor for Local GPS Integrity Monitoring . . . 657
Palmer, D., Moore, T., Hill, C., Andreotti, M. and Park, D. Radio Positioning using the Digital Audio Broadcasting (DAB) Signal . . . 45

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

Peck, D. T. The Empirical Reconstruction of Columbus' Navigational Log and Track of his 1492–1493 Discovery Voyage . . . 193
Peters, D. J. and Hammond, T. R. Interpolation Between AIS Reports: Probabilistic Inferences Over Vessel Path Space . . . 595
Renaudin, V. and Gilliéron, P-Y. Personal Robust Navigation in Challenging Applications . . . 235
Schiffner, I., Pavkovic, T., Siegmund, B. and Wiltschko, R. Strategies of Young Pigeons during 'Map' Learning . . . 431
Schuster, W. and Ochieng, W. Airport Surface Movement – Critical Analysis of Navigation System Performance Requirements . . . 281
Schuster, W. and Ochieng, W. Novel Integrity Concept for CAT III Precision Approaches and Taxiing: Extended GBAS (E-GBAS) . . . 695
Southcott, G. Remotely Piloted Air Systems on Trial and in Operations . . . 1
Szlapczynski, R. Evolutionary Sets Of Safe Ship Trajectories: A New Approach To Collision Avoidance . . . 169
Tanimoto, J. and Sagara, H. Social Diffusive Impact Analysis Based on Evolutionary Computations for a Novel Car Navigation System Sharing Individual Information in Urban Traffic Systems . 711
Teunissen, P. J. G. A New Method For DGPS Ambiguity Resolution? . . . 375
Trzeciak, S. and Siódmak, S. Bering Sea Ice Cover in the Years 1998/9–2007/8 . . . 551
Vepa, R. Ambulatory Position Tracking of Prosthetic Limbs Using Multiple Satellite Aided Inertial Sensors and Adaptive Mixing . . . 295
Vepa, R. and Zhahir, A. High-Precision Kinematic Satellite and Doppler Aided Inertial Navigation System . . . 91
Wild, R. J. The Paradigm and the Paradox of Perfect Pilotage . . . 183
Yun, H., Yun, Y. and Kee, C. Carrier Phase-based RAIM Algorithm Using a Gaussian Sum Filter 75
Zandbergen, P. A. and Barbeau, S. J. Positional Accuracy of Assisted GPS Data from High-Sensitivity GPS-enabled Mobile Phones . . . 381

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

SUBJECT INDEX

Air Navigation:

High-Integrity GPS/INS Integrated Navigation with Error Detection and Application to LAAS. *Fang-Cheng Chan and Boris Pervan* . . . 467

Weighted RAIM for APV: The Ideal Protection Level. *Carl D. Milner and Washington Y. Ochieng* . . . 61

Air Traffic Management:

Airport Surface Movement – Critical Analysis of Navigation System Performance Requirements. *Wolfgang Schuster and Washington Ochieng* . . . 281

Air Traffic Control Separation Minima: Part 1 – The Current Stasis. *Peter Brooker* . . . 449

Air Traffic Control Separation Minima: Part 2 – Transition to a Trajectory-based System. *Peter Brooker* . . . 673

Novel Integrity Concept for CAT III Precision Approaches and Taxiing: Extended GBAS (E-GBAS). *Wolfgang Schuster and Washington Ochieng* . . . 695

A Regional Space Segment Health Monitor for Local GPS Integrity Monitoring. *Carl Milner, Washington Ochieng, Wolfgang Schuster, Marco Porretta and Charles Curry* . . . 657

Animal Navigation:

Strategies of Young Pigeons during 'Map' Learning. *Ingo Schiffner, Tina Pavkovic, Bettina Siegmund and Roswitha Wiltschko* . . . 431

Collision Avoidance:

Evolutionary Sets Of Safe Ship Trajectories: A New Approach To Collision Avoidance. *Rafal Szlapczynski* . . . 169

Modelling Port Water Collision Risk Using Traffic Conflicts. *Ashim Kumar Debnath, Hoong Chor Chin and Md. Mazharul Haque* . . . 645

History:

The Asian Monsoons and Zheng He's Voyages to the Western Ocean. *Deng Hui and Li Xin* . . . 207

The Beginnings of Air Radio Navigation and Communication. *Brian Kendal* . . . 157

The Beginnings of Air Radio Navigation and Communication. *Walter Blanchard* . . . 571

Coastal Navigation in the Mid-20th Century. *John Kemp* . . . 533

The Deployment of Overseas GEE Chains in 1945/46. *Walter Blanchard* . . . 751

The Empirical Reconstruction of Columbus' Navigational Log and Track of his 1492–1493 Discovery Voyage. *Douglas T. Peck* . . . 193

Integrated Navigation Systems:

Entropy Flow-Aided Navigation. *He Deng, Chao Pan, Tongxin Wen and Jianguo Liu* . . . 109

High-Precision Kinematic Satellite and Doppler Aided Inertial Navigation System. *Ranjan Vepa and Amzari Zhahir* . . . 91

A Novel Method to Integrate IMU and Magnetometers in Attitude and Heading Reference Systems. *Songlai Han and Jinling Wang* . . . 727

Rao-Blackwellized Unscented Particle Filter for a Handheld Unexploded Ordnance Geolocation System using IMU/GPS. *Jong Ki Lee and Christopher Jekeli* . . . 327

Land Navigation:

Aiding Low Cost Inertial Navigation with Building Heading for Pedestrian Navigation. *Khairi Abdulrahim, Chris Hide, Terry Moore and Chris Hill* . . . 219

Cartography For Cooperative Manoeuvres With Autonomous Land Vehicles. *Javier Alonso, Vicente Milanés, Enrique Onieva, Joshué Pérez, Carlos González and Teresa de Pedro* . . . 141

Can Low-Cost Road Vehicles Positioning Systems Fulfil Accuracy Specifications of New ADAS Applications? *F. Jiménez, J. E. Naranjo, F. García and J. M. Armingol* . . . 251

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

Comparison of EMG-based and Accelerometer-based Speed Estimation Methods in Pedestrian Dead Reckoning. *Wei Chen, Ruizhi Chen, Xiang Chen, Xu Zhang, Yuwei Chen, Jianyu Wang and Zhongqian* . . . 265
Information Fusion for Localization Within Vehicular Networks. *Mahmoud Efatmaneshnik, Allison Kealy, Asghar Tabatabei Balaei and Andrew G. Dempster* . . . 401
Personal Robust Navigation in Challenging Applications. *Valérie Renaudin and Pierre-Yves Gilliéron* . . . 235
Positional Accuracy of Assisted GPS Data from High-Sensitivity GPS-enabled Mobile Phones. *Paul A. Zandbergen and Sean J. Barbeau* . . . 381
Radio Positioning using the Digital Audio Broadcasting (DAB) Signal. *Duncan Palmer, Terry Moore, Chris Hill, Marcus Andreotti and David Park* . . . 45
Shadow Matching: A New GNSS Positioning Technique for Urban Canyons. *Paul D. Groves* . 417
Social Diffusive Impact Analysis Based on Evolutionary Computations for a Novel Car Navigation System Sharing Individual Information in Urban Traffic Systems. *Jun Tanimoto and Hiroki Sagara* . . . 711
Uncertainty in Personal Navigation Services. *Hassan A. Karimi, Duangduen Roongpiboonsopit and Piyawan Kasemsuppakorn* . . . 341
Where Do People Drive? Navigation System Use by Typical Drivers and Auto Experts. *Victor Ei-Wen Lo, Paul A. Green and Alfred Franzblau* . . . 357

Marine Navigation:
Bering Sea Ice Cover in the Years 1998/9–2007/8. *Stefan Trzeciak and Szymon Siódmak* . . . 551
Estimating Reception Coverage Characteristics of AIS. *Anna-Liesa S. Lapinski and Anthony W. Isenor* . . . 609
Interpolation Between AIS Reports: Probabilistic Inferences Over Vessel Path Space. *D. J. Peters and T. R. Hammond* . . . 595
Human Factors and Maritime Safety. *Christine Chauvin* . . . 625
Maritime Community and its Human Resource Mobility. *Kinzo Inoue* . . . 633
Maritime Head-Up Display: A Preliminary Evaluation. *Eric Holder and Samuel R. Pecota* . . . 573
Maritime Safety Standards and the Seriousness of Shipping Accidents. *Santiago Iglesias Baniela and Capt. Juan Vinagre Ríos* . . . 495
The Paradigm and the Paradox of Perfect Pilotage. *Richard J. Wild* . . . 183
Watch-Keeping on Fishing Vessels: Can Electronic Marine Systems Help? *Stella Mills* . . . 521

Medical Applications:
Ambulatory Position Tracking of Prosthetic Limbs Using Multiple Satellite Aided Inertial Sensors and Adaptive Mixing. *Ranjan Vepa* . . . 295

Navigation Practice:
Accurate Harmonic Series for Inverse and Direct Solutions for the Great Ellipse. *Michael A. Earle* . . . 557
Circle Approximations on Spheroids. *Young Joon Ahn, Jian Cui and Christoph Hoffmann* . . . 739
A New Method For DGPS Ambiguity Resolution? *P. J. G. Teunissen* . . . 375

Satellite Navigation Systems and Techniques:
Carrier Phase-based RAIM Algorithm Using a Gaussian Sum Filter. *Ho Yun, Youngsun Yun and Changdon Kee* . . . 75
Open Source GNSS Reference Server for Assisted-Global Navigation Satellite Systems. *Binghao Li, Jiahuang Zhang, Andrew G. Dempster and Chris Rizos* . . . 127
Precise Velocity Estimation with a Stand-Alone GPS Receiver. *Weidong Ding and Jinling Wang* 311

Unmanned Aerial Vehicles:
The Global Hawk/BAMS Navigation System; an Update to the Odyssey. *Greg S. Loegering* . . . 15
Remotely Piloted Air Systems on Trial and in Operations. *Gary Southcott* . . . 1
Waypoint Navigation of Small-Scale UAV incorporating Dynamic Soaring *O. K. Ariff and T. H. Go* . . . 29

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

THE JOURNAL OF NAVIGATION

Volume 64

2011

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL
EDITED BY NORMAN HUGHES

THE ROYAL INSTITUTE OF NAVIGATION
AT THE ROYAL GEOGRAPHICAL SOCIETY
1 KENSINGTON GORE, LONDON SW7 2AT

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

THE ROYAL INSTITUTE OF NAVIGATION

PATRON

HRH THE PRINCE PHILIP DUKE OF EDINGBURGH, KG, KT, OM

OFFICERS AND COUNCIL 2010–2011

PRESIDENT

D. H. Barnes

VICE PRESIDENTS

C. M. D. Beatty

R. A. McKinlay

HONORARY TREASURER

D. Cockburn

CHAIRMAN OF THE TECHNICAL COMMITTEE

Prof. A. P. Norris

CHAIRMAN OF THE MEMBERSHIP & FELLOWSHIP COMMITTEE

Wg Cdr J. W. Lindsay

Other Members of Council

Gp Capt. C. S. Blount RAF
Dr N. D. Hughes OBE
Prof. T. Moore
Prof. W. Y. Ochieng
R. D. Pike
Ms C. Robinson
Capt J. B. Taylor OBE
Ms M. M. G. M. von Wendland
G. L. White
Capt R. J. Wild

DIRECTOR

Capt P. C. Chapman-Andrews, LVO MBE

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

CONTENTS

Remotely Piloted Air Systems on Trial and in Operations
Gary Southcott 1
The Global Hawk/BAMS Navigation System; an Update to the Odyssey...
Greg S. Loegering 15
Waypoint Navigation of Small-Scale UAV incorporating Dynamic Soaring
O. K. Ariff and T. H. Go 29
Radio Positioning using the Digital Audio Broadcasting (DAB) Signal
Duncan Palmer, Terry Moore, Chris Hill, Marcus Andreotti and David Park 45
Weighted RAIM for APV: The *Ideal* Protection Level
Carl D. Milner and Washington Y. Ochieng 61
Carrier Phase-based RAIM Algorithm Using a Gaussian Sum Filter
Ho Yun, Youngsun Yun and Changdon Kee 75
High-Precision Kinematic Satellite and Doppler Aided Inertial Navigation System
Ranjan Vepa and Amzari Zhahir 91
Entropy Flow-Aided Navigation
He Deng, Chao Pan, Tongxin Wen and Jianguo Liu 109
Open Source GNSS Reference Server for Assisted-Global Navigation Satellite Systems
Binghao Li, Jiahuang Zhang, Andrew G. Dempster and Chris Rizos 127
Cartography For Cooperative Manoeuvres With Autonomous Land Vehicles
Javier Alonso, Vicente Milanés, Enrique Onieva, Joshué Pérez, Carlos González and Teresa de pedro 141
The Beginnings of Air Radio Navigation and Communication
Brian Kendal 157
Evolutionary Sets Of Safe Ship Trajectories: A New Approach To Collision Avoidance
Rafal Szlapczynski 169
The Empirical Reconstruction of Columbus' Navigational Log and Track of his 1492–1493 Discovery Voyage
Douglas T. Peck 193
The Asian Monsoons and Zheng He's Voyages to the Western Ocean
Deng Hui and Li Xin 207
Aiding Low Cost Inertial Navigation with Building Heading for Pedestrian Navigation
Khairi Abdulrahim, Chris Hide, Terry Moore and Chris Hill 219
Personal Robust Navigation in Challenging Applications
Valérie Renaudin and Pierre-Yves Gilliéron 235
Can Low-Cost Road Vehicles Positioning Systems Fulfil Accuracy Specifications of New ADAS Applications?
F. Jiménez, J. E. Naranjo, F. García and J. M. Armingol 251
Comparison of EMG-based and Accelerometer-based Speed Estimation Methods in Pedestrian Dead Reckoning
Wei Chen, Ruizhi Chen, Xiang Chen, Xu Zhang, Yuwei Chen, Jianyu Wang and Zhongqian 265
Airport Surface Movement – Critical Analysis of Navigation System Performance Requirements
Wolfgang Schuster and Washington Ochieng 281
Ambulatory Position Tracking of Prosthetic Limbs Using Multiple Satellite Aided Inertial Sensors and Adaptive Mixing
Ranjan Vepa 295
Precise Velocity Estimation with a Stand-Alone GPS Receiver
Weidong Ding and Jinling Wang 311
Rao-Blackwellized Unscented Particle Filter for a Handheld Unexploded Ordnance Geolocation System using IMU/GPS
Jong Ki Lee and Christopher Jekeli 327
Uncertainty in Personal Navigation Services
Hassan A. Karimi, Duangduen Roongpiboonsopit and Piyawan Kasemsuppakorn 341
Where Do People Drive? Navigation System Use by Typical Drivers and Auto Experts
Victor Ei-Wen Lo, Paul A. Green and Alfred Franzblau 357
Positional Accuracy of Assisted GPS Data from High-Sensitivity GPS-enabled Mobile Phones
Paul A. Zandbergen and Sean J. Barbeau 381

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

Information Fusion for Localization Within Vehicular Networks
Mahmoud Efatmaneshnik, Allison Kealy, Asghar Tabatabei Balaei and Andrew G. Dempster 401
Shadow Matching: A New GNSS Positioning Technique for Urban Canyons
Paul D. Groves 417
Strategies of Young Pigeons during 'Map' Learning
Ingo Schiffner, Tina Pavkovic, Bettina Siegmund and Roswitha Wiltschko 431
Air Traffic Control Separation Minima: Part 1 – The Current Stasis
Peter Brooker 449
High-Integrity GPS/INS Integrated Navigation with Error Detection and Application to LAAS
Fang-Cheng Chan and Boris Pervan 467
Maritime Safety Standards and the Seriousness of Shipping Accidents
Santiago Iglesias Baniela and Capt. Juan Vinagre Ríos 495
Watch-Keeping on Fishing Vessels: Can Electronic Marine Systems Help?
Stella Mills 521
Coastal Navigation in the Mid-20th Century
John Kemp 533
Bering Sea Ice Cover in the Years 1998/9–2007/8
Stefan Trzeciak and Szymon Siódmak 551
Accurate Harmonic Series for Inverse and Direct Solutions for the Great Ellipse
Michael A. Earle 557
Maritime Head-Up Display: A Preliminary Evaluation
Eric Holder and Samuel R. Pecota 573
Interpolation Between AIS Reports: Probabilistic Inferences Over Vessel Path Space
D. J. Peters and T. R. Hammond 595
Estimating Reception Coverage Characteristics of AIS
Anna-Liesa S. Lapinski and Anthony W. Isenor 609
Human Factors and Maritime Safety
Christine Chauvin 625
Maritime Community and its Human Resource Mobility
Kinzo Inoue 633
Modelling Port Water Collision Risk Using Traffic Conflicts
Ashim Kumar Debnath, Hoong Chor Chin and Md. Mazharul Haque 645
A Regional Space Segment Health Monitor for Local GPS Integrity Monitoring
Carl Milner, Washington Ochieng, Wolfgang Schuster, Marco Porretta and Charles Curry 657
Air Traffic Control Separation Minima: Part 2 – Transition to a Trajectory-based System
Peter Brooker 673
Novel Integrity Concept for CAT III Precision Approaches and Taxiing: Extended GBAS (E-GBAS)
Wolfgang Schuster and Washington Ochieng 695
Social Diffusive Impact Analysis Based on Evolutionary Computations for a Novel Car Navigation System Sharing Individual Information in Urban Traffic Systems
Jun Tanimoto and Hiroki Sagara 711
A Novel Method to Integrate IMU and Magnetometers in Attitude and Heading Reference Systems
Songlai Han and Jinling Wang 727
Circle Approximations on Spheroids
Young Joon Ahn, Jian Cui and Christoph Hoffmann 739
The Deployment of Overseas GEE Chains in 1945/46
Walter Blanchard FRIN 751
FORUM
The Paradigm and the Paradox of Perfect Pilotage
Richard J. Wild 183
A New Method For DGPS Ambiguity Resolution?
P. J. G. Teunissen 375
The Beginnings of Air Radio Navigation and Communication
Walter Blanchard, FRIN 571
Author Index 757
Subject Index 759

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

THE ROYAL INSTITUTE OF NAVIGATION

Aims and Objects

The objects of the Institute are to unite in one body those who are concerned with or who are interested in navigation and to further its development. Navigation is conceived as applying to locomotion of all kinds and is perceived as encompassing aspects of: command and control, psychology and zoology, operational research, risk analysis, theoretical physics, operation in hostile environments, instrumentation, ergonomics, financial planning and law as well as electronics, astronomy, mathematics, cartography and other subjects traditionally associated with navigation.

The aims of the Institute are to encourage the creation and dissemination of knowledge through research and development, to co-ordinate information from all the disciplines involved, to provide a forum in which new ideas and new products can have the benefit of informed and professional scrutiny and to further education and communication.

The Institute initiates conferences and symposia on specific subjects and has a programme of meetings at which lectures are given and discussed.There are standing Special Interest Groups (SIGs) which keep under constant review pertinent aspects of navigation.The success of these Special Interest Groups is crucially dependent on the active involvement of members.

The SIGS include: Animal Navigation Group (ANG), Civil and Military Aviation Group (CMAG), General Aviation Navigation Group (GANG), History of Air Navigation Group (HANG), Land Vehicle Navigation Group (LVNG), Marine Traffic Navigation Group (MTNG), Navigation On Foot (NOF), Small Craft Group (SCG) and Satellite Special Interest Group (SATSIG).

The Institute publishes *The Journal of Navigation* four times a year. It contains papers which have been presented at meetings, other original papers and selected papers and reports from Special Interest Groups. The Institute also publishes *Navigation News* six times a year which contains a full account of the Institute's proceedings and activities.This includes Branch News, a record of current navigational work, a diary of events, topical articles, news about Membership and advertising. A great deal of the Institute's work is international in character and is co-ordinated with that of similar organizations in other countries.

Membership

There are seven classes of Membership of the Institute:

(1) HONORARY FELLOWS: Distinguished persons upon whom the Council may see fit to confer an honorary distinction.

(2) FELLOWS: Members, of at least three years' standing, holding certain qualifications laid down in the by-laws; these qualifications include having made a contribution of value to navigation.

(3) ASSOCIATE FELLOWS: Individuals who satisfy the Council of their high level of professional achievement or experience in the advancement of navigation operations, concepts or equipment.

(4) MEMBERS: Persons over twenty-one years of age who satisfy the Council of their interest in navigation.

(5) STUDENT MEMBERS: Persons under twenty-five years of age studying at a recognized school or university with a view to making navigation, or an allied interest, their career.

(6) CORPORATE MEMBERS: Organizations such as universities, navigation schools, government departments or companies, here and abroad, who are directly or indirectly interested in the science of navigation. Corporate Members are entitled to send representatives to all Institute meetings and to receive six copies of its publications.They are encouraged to take an active part in the Institute's work. Applications should be sent by letter addressed to the Director.

(7) RETIRED MEMBERS: Fellows or Members of 65 years of age or over who have paid no fewer than 6 annual subscriptions.

There is also Associateship of the Institute,which gives entitlement of Membership to one Special Interest Group SIG, but not to receipt of the *Journal of Navigation*.

Subscriptions

Annual subscriptions to the Institute are payable in advance as follows (prices are inclusive of vat):

Fellows	£128
Associate Fellows	£123
Members	£118
Student Members	£15

© 2011 The Royal Institute of Navigation

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press

THE JOURNAL OF NAVIGATION

VOLUME 64 NUMBER 4 OCTOBER 2011

CONTENTS

Maritime Head-Up Display: A Preliminary Evaluation 573
Eric Holder and Samuel R. Pecota

Interpolation Between AIS Reports: Probabilistic Inferences Over Vessel Path Space 595
D. J. Peters and T. R. Hammond

Estimating Reception Coverage Characteristics of AIS 609
Anna-Liesa S. Lapinski and Anthony W. Isenor

Human Factors and Maritime Safety 625
Christine Chauvin

Maritime Community and its Human Resource Mobility 633
Kinzo Inoue

Modelling Port Water Collision Risk Using Traffic Conflicts 645
Ashim Kumar Debnath, Hoong Chor Chin and Md. Mazharul Haque

A Regional Space Segment Health Monitor for Local GPS Integrity Monitoring 657
Carl Milner, Washington Ochieng, Wolfgang Schuster, Marco Porretta and Charles Curry

Air Traffic Control Separation Minima: Part 2 – Transition to a Trajectory-based System 673
Peter Brooker

Novel Integrity Concept for CAT III Precision Approaches and Taxiing: Extended GBAS (E-GBAS) 695
Wolfgang Schuster and Washington Ochieng

Social Diffusive Impact Analysis Based on Evolutionary Computations for a Novel Car Navigation System Sharing Individual Information in Urban Traffic Systems 711
Jun Tanimoto and Hiroki Sagara

A Novel Method to Integrate IMU and Magnetometers in Attitude and Heading Reference Systems 727
Songlai Han and Jinling Wang

Circle Approximations on Spheroids 739
Young Joon Ahn, Jian Cui and Christoph Hoffmann

The Deployment of Overseas GEE Chains in 1945/46 751
Walter Blanchard FRIN

Author Index 757

Subject Index 759

Cambridge Journals Online
For further information about this journal please go to the journal website at:
journals.cambridge.org/nav

FSC www.fsc.org
MIX
Paper from responsible sources
FSC® C018127

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0373463311000312 Published online by Cambridge University Press