### 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: Land Navigation and Location Group (LN&L), General Aviation Navigation Group (GANG), History of Air Navigation Group (HANG), Civil and Military Air Group (CMAG), Marine Traffic & Navigation Group (MT&NG), Small Craft Group (SCG), eLORAN Group (eLORAN), Space Group (Space), Animal Navigation Group (ANG) and Research & Development Group (R&D).

The Institute publishes *The Journal of Navigation* six 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 nine classes of membership under which individuals or organisations may apply to join the Institute. Details of the various membership criteria and current subscriptions are available on the RIN website (Home / Join the RIN / Membership Types http://www.rin.org.uk/general.aspx?ID=59) and from the Membership Secretary (membership@rin.org.uk Tel: +44(0)20 7591 3130 Fax: 44(0)20 7591 3131).

- (1) Ordinary Membership
- (2) Associate Membership
- (3) Associate Fellow Membership
- (4) Student Membership
- (5) Junior Associate Membership
- (6) Corporate Membership
- (7) Small Business Membership
- (8) Affiliate College University Membership
- (9) Affiliate Club Membership

Additional membership classes of Fellowship, Honorary Fellowship, Retired Membership and Affiliate Membership also exist and details are available from the Membership Secretary.

The subscription price (excluding VAT) to The *Journal* (ISSN 0373–4633) for Volume 67, 2014, which includes print and electronic access, is £446 (USA, Canada and Mexico US \$822) and includes delivery by air; single parts are available at £123 (USA, Canada and Mexico US \$218) plus postage. The electronic-only price available to institutional subscribers is £353 (USA, Canada and Mexico US \$643). EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. The *Journal* is issued free to all Members of the Institute. Orders, which must be accompanied by payment, may be sent to any bookseller or subscription agent or direct to the publishers: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, or in the USA, Canada and Mexico to Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York 10994–2133. Japanese prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan.

© 2014 The Royal Institute of Navigation

# THE JOURNAL OF NAVIGATION

VOLUME 67 NUMBER 3 MAY 2014

# CONTENTS

Development of a Digital Accident Hotspot Map for ADAS Applications Using Geospatial Methods in GIS	353
Hao Ye, Xiaolin Meng, Lei Yang and Suchith Anand	
Assessment and Mitigation of Ionospheric Disturbance Effects on GPS Accuracy and Integrity	371
Duojie Weng, Shengyue Ji, Wu Chen and Zhizhao Liu	
<b>Predicting the Success Rate of Long-baseline GPS+Galileo (Partial) Ambiguity Resolution</b> Dennis Odijk, Balwinder S. Arora and Peter J.G. Teunissen	385
A Simple Approach to Great Circle Sailing: The COFI Method Chih-Li Chen, Pin-Fang Liu and Wei-Ting Gong	403
Loosely Coupled INS/GPS Integration with Constant Lever Arm using Marginal Unscented Kalman Filter Guobin Chang	419
Inter-satellite Ranging Augmented GPS Relative Navigation for Satellite Formation Flying Yang, Yong Li, Chris Rizos, Andrew G. Dempster and Xiaokui Yue	437
Analysis of Mobile 3-D Radar Error Registration when Radar Sways with Platform L. Chen, G.H. Wang, Y. He and I. Progri	451
<b>Decoupled Observability Analyses of Error States in INS/GPS Integration</b> Yanhai Ma, Jiancheng Fang, Wei Wang and Jianli Li	473
New Meridian Arc Formulae by the Least Squares Method Wei-Kuo Tseng, Wei-Jie Chang and Chin-Lin Pen	495
<b>Performance Analysis of Ionosphere Monitoring with BeiDou CORS Observational Data</b> Weiming Tang, Lei Jin and Kun Xu	511
Precise Point Positioning Using the Regional BeiDou Navigation Satellite Constellation Aigong Xu, Zongqiu Xu, Xinchao Xu, Huizhong Zhu, Xin Sui and Huasheng Sun	523
ERRATUM	538
FORUM Orthodrome-Loxodrome Correlation by the Middle Latitude Rule Miljenko Petrović	539

