

# JOURNAL OF APPLIED GEODESY

## **EDITORS-IN-CHIEF**

*Hans-Berndt Neuner, Vienna*

*Chris Rizos, Sydney*

## **EDITORIAL BOARD**

*Xiaoli Ding, Hong Kong*

*Andreas Eichhorn, Darmstadt*

*Naser El-Sheimy, Calgary*

*Linlin Ge, Sydney*

*Vassilis Gikas, Athens*

*Dorota Grejner-Brzezinska, Columbus*

*Cheinway Hwang, Hsinchu*

*Allison Kealy, Melbourne*

*Heiner Kuhlmann, Bonn*

*Hansjorg Kutterer, Frankfurt*

*Werner Lienhart, Graz*

*Xiaolin Meng, Nottingham*

*Gyula Mentés, Sopron*

*Wolfgang Niemeier, Braunschweig*

*Alexander Reiterer, Freiburg*

*Guenther Retscher, Vienna*

*Volker Schwieger, Stuttgart*

*Peter Teunissen, Delft and Perth*

*Andreas Wieser, Zürich*

*Caijun Xu, Wuhan*

**DE GRUYTER**

**JOURNAL OF APPLIED GEODESY** is a forum for peer-reviewed research articles in the area of application of geodesy to engineering and other natural sciences. It publishes innovative contributions on sensor developments, multi-sensor systems and sensor data fusion focusing on the capture of georeferenced data. Hence topics related to navigation and mobile mapping will also be covered. The scope includes optical and microwave 3-D measurement techniques and other sensors for geotechnical measurements. Furthermore, applied geodesy articles from all areas of satellite-based geodetic networks, deformation measurements, deformation analysis, modelling of local geodynamic processes and the development of intelligent alert systems, measurement techniques for large construction sites and mechanical engineering will be presented. With increased use of the tools of Artificial Intelligence for sensor control, sensor fusion and data analysis, manuscripts on these topics with a strong emphasis on applied geodesy will also be published.

**ABSTRACTED/INDEXED IN** Astrophysics Data System (ADS) · Baidu Scholar · CNKI Scholar (China National Knowledge Infrastructure) · CNPIEC: cnpLINKer · Current Geographical Publications · Dimensions · EBSCO (relevant databases) · EBSCO Discovery Service · Ei Compendex · Engineering Village · Genamics JournalSeek · GeoArchive · Geobase · GeoRef · Google Scholar · Index Copernicus · Inspec · Japan Science and Technology Agency (JST) · J-Gate · JournalGuide · JournalTOCs · KESLI-NDSL (Korean National Discovery for Science Leaders) · MyScienceWork · Naver Academic · Naviga (Softweco) · Norwegian Register for Scientific Journals, Series and Publishers · Primo Central (ExLibris) · ProQuest (relevant databases) · Publons · QOAM (Quality Open Access Market) · ReadCube · Reaxys · Scilit · SCImago (SJR) · SCOPUS · Semantic Scholar · Sherpa/RoMEO · Summon (ProQuest) · TDNet · Ulrich's Periodicals Directory/ulrichsweb · WanFang Data · Web of Science: Emerging Sources Citation Index · WorldCat (OCLC) · X-MOL · Yewno Discover

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions of liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at [www.degruyter.com/jag](http://www.degruyter.com/jag).

ISSN 1862-9016 - e-ISSN 1862-9024 - CODEN JAGOCE

**RESPONSIBLE EDITORS** Prof. Dr. Hans-Berndt Neuner, Research Division Engineering Geodesy, Department for Geodesy and Geoinformation, Vienna University of Technology, Wiedner Hauptstrasse 8–10, 1040 Vienna, Austria, e-mail: [hans.neuner@geo.tuwien.ac.at](mailto:hans.neuner@geo.tuwien.ac.at)  
Prof. Dr. Chris Rizos, School of Civil and Environmental Engineering, University of New South Wales, Sydney NSW 2052, Australia, e-mail: [c.rizos@unsw.edu.au](mailto:c.rizos@unsw.edu.au)

**PUBLISHER** Walter de Gruyter GmbH, Berlin/Boston, Genthiner Straße 13, 10785 Berlin, Germany

**JOURNAL COORDINATOR** Torsten Krüger, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05-176, Fax: +49 (0)30 260 05-352, e-mail: [torsten.krueger@degruyter.com](mailto:torsten.krueger@degruyter.com)

**ADVERTISEMENTS** e-mail: [anzeigen@degruyter.com](mailto:anzeigen@degruyter.com)

© 2023 Walter de Gruyter GmbH, Berlin/Boston, Germany

**TYPESETTING** TNQ Technologies, Chennai, India

**PRINTING** Franz X. Stücker Druck und Verlag e.K., Ettenheim



## Contents

### Review

Gilles Teodori and Hans Neuner

**Investigation of the trade-off between the complexity of the accelerometer bias model and the state estimation accuracy in INS/GNSS integration — 181**

### Original Research Articles

Yeqing Tao, Juan Yang and Qiaoning He

**Solution for ill-posed EIV model regularization attending to its decreasing regularization characteristic — 197**

Gereon Tombrink, Ansgar Dreier, Lasse Klingbeil and Heiner Kuhlmann

**Trajectory evaluation using repeated rail-bound measurements — 205**

Eyasu Alemu

**Global geopotential models evaluation based on terrestrial gravity data over Ethiopia — 217**

Yifan Zheng, Xianwen Yu and Jiafu Wang

**A calculation method for GNSS positioning precision based on the posteriori unit weight variance — 237**

Katarzyna Chwedczuk, Ciro Gioia, Bogdan Skorupa and Kamil Maciuk

**Accuracy and reliability of BeiDou clocks — 245**

Kamil Kazmierski, Kamil Dominiak and Grzegorz Marut

**Positioning performance with dual-frequency low-cost GNSS receivers — 255**

Andreas Baumann-Ouyang, Jemil Avers Butt and Andreas Wieser

**Estimating 3D displacement vectors from line-of-sight observations with application to MIMO-SAR — 269**

Fitore Bajrami Lubishtani, Bashkim Idrizi and Milot Lubishtani

**Determination of the height reference surface for the Republic of Albania by using global geopotential models — 285**

Ali Almagbile, Jinling Wang and Abdulla Al-Rawabdeh

**An integrated adaptive Kalman filter for improving the reliability of navigation systems — 295**