Special Issue on Advances in Signal Processing for Global Navigation Satellite Systems

Global Navigation Satellite Systems (GNSS) technology is nowadays ubiquitous in many transversal infrastructures and is of paramount importance in all applications where precise position, navigation, and timing (PNT) of user equipment is required. GNSS is the pervasive PNT technology in outdoor environments, where its performance, coverage, and reliability exceed other technical solutions. Nevertheless, challenges and vulnerabilities exist in the use of GNSS, particularly in challenging scenarios where signal propagation is either naturally impaired (for instance, due to multipath-rich channels, ionospheric scintillation, or urban canyons) or intentionally degraded (for instance, when jamming devices are in place or in case of spoofing attacks, where a malicious user tries to deceive the receiver by forging legitimate-like signals). In these situations, signal processing techniques appear extremely useful.

Signal processing has always played a key role in GNSS design, performance enhancement, and vulnerabilities mitigation. Many algorithms have been developed for both single- and multi-antenna GNSS receivers where the GNSS, interference, and noise signals are analyzed in time, frequency, space and joint-variable domains. The past decade has witnessed the emergence of new signal processing techniques addressing sparse signal properties, random and sub-Nyquist sampling, efficient aperture synthesis, emitter direction finding, computational methods for Bayesian inference, nonparametric inference, graph signal processing, and distributed estimation and detection. These new techniques find important applications in GNSS receiver design. Conversely, spoofers and smart jamming, difficulties in indoor localizations, new navigation codes and signal structures, increased complexity and advanced design of digital GNSS receivers, combined with integrations of different satellite navigations systems, have invited the development of novel signal processing algorithms that can meet the new challenges facing this industry.

The issue delineates the new challenges in satellite navigations from signal processing perspectives, reporting about the latest advances in those algorithms applied in user equipment to provide PNT and on the modern criteria for signal design that are being investigated for the current- and next-generation GNSS constellations. This special issue provides a venue for summarizing, educating and sharing the state-of-the-art in signal processing applied to the domain of GNSS.

Topics of Interest include (but are not limited to):
- Advanced signal processing techniques for robust GNSS.
- Advanced anti-jamming and anti-spoofing countermeasures.
- Vulnerabilities of GNSS, including scintillation mitigation.
- Closed-loop and open-loop receiver design for robust PNT.
- New GNSS signal, modulation, and coding formats.
- Multiplexing techniques.
- Multi-sensor hybridization.
- Novel applications and experimental activities.

Important Dates	
White paper due:	**September 15, 2016**
Invitation notification:	**October 20, 2016**
Manuscript submission due:	**December 20, 2016**
Review decision:	**March 10, 2017**
Revised manuscript due:	**April 10, 2017**
Final decision notification:	**May 25, 2017**
Final material from authors:	**June 10, 2017**
Tentative publication date:	**September 2017**

White papers are required, and full articles are invited based on the review of white papers. The white paper format is up to 4 pages in length, including proposed article title, motivation and significance of the topic, an outline of the proposed paper, and representative references; an author list, contact information and short bios should also be included. Articles submitted to this issue must be of tutorial and overview/survey nature and in an accessible style to a broad audience, and have significant relevance to the scope of the special issue. Submissions will be reviewed according to the IEEE Signal Processing Magazine guidelines, and should not have been published or under review elsewhere. Submissions should be made online at http://mc.manuscriptcentral.com/sps-ieee . For guidelines and information on paper submissions, visit http://signalprocessingsociety.org/publications-resources/ieee-signal-processing-magazine/information-authors-spm

Guest Editors
Dr. Pau Closas (Lead Guest Editor), Centre Tecnològic de Telecomunicacions de Catalunya, Spain, pau.closas@cttc.cat
Prof. Marco Luise, University of Pisa, Italy, marco.luise@unipi.it
Dr. José-Ángel Ávila-Rodríguez, European Space Agency, The Netherlands, jose.angel.avila.rodriguez@esa.int
Dr. Christopher Hegarty, The MITRE Corporation, USA, chegarty@mitre.org
Prof. Jiyun Lee, KAIST, Republic of Korea, jiyunlee@kaist.ac.kr