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2015 IEEE GRSS Data Fusion Contest: Extremely High Resolution LiDAR and Optical Data

INTRODUCTION

The 2015 Data Fusion Contest, organized by the Image Analysis and Data Fusion Technical Committee (IADF TC) of the IEEE Geoscience and Remote Sensing Society (GRSS), aims at providing a challenging image analysis opportunity, including multiresolution and multisensor fusion at extremely high resolution. The 2015 Contest involves two datasets acquired simultaneously by passive and active sensors. The passive data is a 5cm-resolution color orthophoto acquired in the visible wavelength range. The active data source is a 65 pts/m^2 LiDAR 3D point cloud that is provided both as raw 3D coordinates (ASCII format) and as a Digital Surface Model (DSM) with a point spacing of about 10 cm. The laser scan rate, angle, and frequency were 125 Hz, 20°, and 49 Hz, respectively. The LiDAR data include the first, last and one intermediate return.

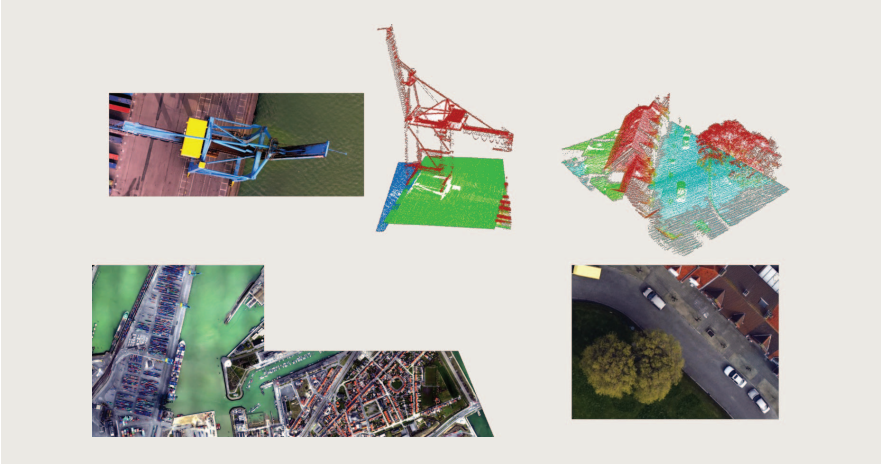


FIGURE 1. Multisource data set for the 2015 Data Fusion Contest: overview of the color orthophoto and details of the extremely high-resolution data from a color camera and of the corresponding LiDAR point cloud. Data acquired and provided by CISS-RMA.

Both datasets were acquired on March 13, 2011, using an airborne platform flying at an altitude of 300m over the harbor area of Zeebruges, Belgium (51.33 °N, 3.20 °E, see Fig. 1). The department of Communication, Information, Systems and Sensors (CISS) of the Belgian Royal Military Academy (RMA) acquired and provided the dataset.

The 2015 Data Fusion Contest has been organized as two parallel competitions, both framed as paper contests: the 2D Contest and the 3D Contest. These contests have totally open topics and aim at fostering new uses of such extremely high resolution data aiming either at improving the quality of remote sensing products or at proposing entirely new uses of these complementary data sources.

II. HOW TO GET THE DATA AND ENTER THE CONTEST

The 2015 Data Fusion Contest aims at promoting novel synergetic uses of multiresolution and multisensor data in active and passive remote sensing. Participants will submit 4-page IEEE-style manuscripts using the aforementioned data for fusion tasks. Each manuscript will describe the addressed problem, the proposed method, and the experimental results. The topic of the manuscript in the data fusion area is totally open and participants are encouraged to tackle open and cutting-edge problems in multisensor and/or multiresolution data processing, and to consider a 2D and/or a 3D problem. This last choice will determine to which of the two tracks of the Contest

Digital Object Identifier 10.1109/MGRS.2015.2397448
Date of publication: 25 March 2015

the manuscript will be submitted. Papers dealing with 2D mapping problems identified by *x*-*y* coordinates (for example registration of the DSM with the image, multisource or multiresolution image classification, car/building/marine vessel detection in the image plane, or extraction of spatial features using active sensing in urban areas) will be submitted to the 2D contest. Papers dealing inherently with 3D problems including a third z height coordinate (for example 3D rendering, 3D object detection, classification and detection in the point cloud) will be submitted to the 3D contest. To register for the Contest and download the data, participants will visit the IADF TC website: http://www.grss-ieee.org/community/technical-committees/data-fusion/data-fusion-contest/.

Participants are obliged to read and to accept the Contest terms and conditions. Each manuscript will be written in English and will be formatted as a PDF file following the guidelines and templates for full papers of the 2015 IEEE Geoscience and Remote Sensing Symposium (IGARSS 2015; details can be found at http://www.igarss2015.org/Papers/PaperKit.html#PartIIIa). The manuscript will specify the name(s), affiliation(s), and e-mail contact(s) of the (individual or team) participant(s). Submission will consist in sending the manuscript as an attachment to an email addressed to iadf_chairs@grss-ieee.org. The format of the submission is detailed on the contest website (link above). The submission deadline is April 30, 2015.

Questions and comments on the data and the Contest can be submitted to the Linkedin group of the IADFTC: https://www.linkedin.com/groups/IEEE-Geoscience-Remote-Sensing-Society-3678437.

III. AWARD COMMITTEE

Each manuscript submitted (to either the 2D or 3D track) will be evaluated by an Award Committee on the basis of its novelty, scientific contribution, analysis and fusion methodology, experimental validation, and clarity of explanation. The Award Committee will be composed of:

- Jon A. Benediktsson, University of Iceland (Iceland)
- Jenny Q. Du, Mississippi State University (USA)
- Paolo Gamba, University of Pavia (Italy)
- Gabriele Moser, University of Genoa (Italy)
- Fabio Pacifici, DigitalGlobe Inc. (USA)
- Michal Shimoni, Royal Military Academy (Belgium)
- Devis Tuia, University of Zurich (Switzerland).

IV. RESULTS, AWARDS, AND PRIZES

The winning teams of both competitions will be awarded at IGARSS 2015 in Milan, Italy, in July 2015. The awards are the following:

- The winning teams (1st and 2nd ranking of both tracks) will have their papers included in an invited session of the IGARSS 2015 conference, where the outcome of the contest will be presented. The papers will be included in the technical program, as well as in the proceedings on IEEE Xplore.
- The winning teams (1st and 2nd ranking of both tracks) will be rewarded during the Technical Committees and Chapter Chairs Dinner. Each team will be awarded an IEEE Certificate of Recognition.
- The winning teams (1st and 2nd ranking of both tracks) will co-author a paper summarizing the outcome of both competitions to be submitted to the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS). In order to maximize impact and promote the potential of current multisource remote sensing technologies, the open-access option will be used for this submission.
- The 1st ranking team of each track will receive an ASUS Transformer Book 2-in-1 tablet/laptop (one per team).

GRSS will cover the costs related to the prizes, to the open-access fees, and to the winning teams' participation to the Technical Committees and Chapter Chairs Dinner at IGARSS 2015.

ACKNOWLEDGMENT

The Contest is being organized in collaboration with the department of Communication, Information, Systems & Sensors (CISS) of Belgian Royal Military Academy (RMA). The IADF TC wishes to express its greatest appreciation to the CISS-RMA, for acquiring and providing the data used in the competition and for indispensable contribution to the organization of the Contest, and to the IEEE GRSS for continuously supporting the annual Data Fusion Contest through funding and resources.

GRS

