I. INTRODUCTION

The 2017 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 multimodal fusion. The 2017 contest focuses on the classification of local climate zones (LCZs, [1]) in various urban environments. Local climate zones are a generic, climate-based typology of urban and natural landscapes, which delivers information on basic physical properties of an area that can be used by land use planners or climate modelers. LCZ can be classified using supervised classifiers and multi-spectral images [2]. LCZ are used as first order...
Due to the nature of LCZ classes, which are more tributary of density and spatial organization (structure, geometry) of urban objects, than of specific material occurring at pixel level (e.g. most classes include buildings and trees), the zones are defined as hundreds of meters to kilometers in scale. The LCZ considered in the Data Fusion Contest 2017 are a set of 17 classes (Figure 1), involving 10 urban classes (LCZ 1 to 10) and 7 land cover classes (LCZ A to G). An example of LCZ map over the city of Bologna (Italy) can be seen in Fig. 2.

Fig. 1. LCZ classes considered in the Data Fusion Contest 2017 (from [1], © American Meteorological Society. Used with permission)

Fig. 2. LCZ mapping over the city of Bologna (Italy). Left: class polygons defined by crowdsourcing; right: LCZ map obtained. (Note: Bologna is NOT among the test cities).
The 2017 Data Fusion Contest is organized as a global land use classification competition: to foster the development of methodologies that generalize beyond the data they have been trained with [4], the contest invites participants to develop models that are able to perform well on new cities, unseen during training. Classification is to be performed at coarse resolution (100 m$^2$ resolution grids) for a set of cities, including their direct surroundings. The contest is organized in two steps: in the first step, participants receive a set of data and training labels from a selection of cities (the training cities hereafter: Berlin, Rome, Paris, Sao Paolo, Hong Kong). These data are used to train LCZ classification models. In the second step, participants receive data from a new set of cities, but this time with labels undisclosed (the test cities hereafter). The test cities may come from different geographical, cultural and climatic backgrounds, raising an important challenge for adaptive models that must be robust to acquisition conditions of the data and different semantic meanings of the LCZ classes. As an outcome to the second step, the participants are invited to upload classified maps of the test cities on an evaluation server.

To promote an open system applicable globally, classification is to be performed with open data, which can be freely obtained for any urban area worldwide. For the Data Fusion Contest 2017, the organizing committee has provided Landsat 8, Sentinel 2 (both resampled to the target grid) and OpenStreetMap data (both vector and resampled 5m grid) for the cities considered (examples of the data over the city of Berlin can be seen in Fig. 3), but also welcomes participants to make use of the higher resolution sources (the links for direct download are provided in the data package), as well as alternative data sources that are open and globally available. The use of proprietary data is not permitted.

Fig. 3. Data involved in the Data Fusion Contest 2017. From left to right: Landsat 8 image; Open Street Map building footprints; Open Street Map roads layer. Examples are taken from a subset of the city of Berlin.
II. How to Get the Data and Enter the Contest

The 2017 Data Fusion Contest aims at promoting novel synergetic uses of multisensor, open source data to solve a multi-city land use classification problem. The data and labels for the 5 training cities has been released on January 9th, 2017, while the data for test cities will be released on March 13, 2017. The accuracy of the maps will be compared online on the held out test set only. Participants will submit their LCZ maps of the test cities, as well as a short description of their method, to the Data and Algorithms Standardized Evaluation website (http://dase.ticinumaerospace.com/) before April 1st, 2017. The evaluation server will be closed on April 1st at 23:59, UTC –12 time zone (corresponding to April 2nd, 2017, 7:59 in New York City, 13:59 in Paris, or 19:59 in Beijing). The submission format is specified in the contest webpage on the AIDF TC website (see below). The evaluation server will then be re-opened and the challenge will remain open for the community ever after.

To register for the contest and download the data, participants visit the IADF TC website:

Participants are obliged to read and to accept the contest terms and conditions. Questions and comments on the data and the contest can be submitted to the Linkedin group of the IADF TC:
https://www.linkedin.com/groups/IEEE-Geoscience-Remote-Sensing-Society-3678437

III. Results, Awards, and Prizes

The winning teams of the Data Fusion Contest will be awarded in July 2017 at IGARSS 2017 in Fort Worth, Texas, USA. The awards are the following:

- The teams submitting the four best performing solutions will be invited to submit an invited manuscript to be presented in IGARSS 2017 in Fort Worth, TX. 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 2017 IEEE Geoscience and Remote Sensing Symposium (IGARSS 2017; details can be found at http://www.igarss2017.org/Papers/PaperKit.html). The manuscript will specify the name(s), affiliation(s), and e-mail contact(s) of the (individual or team) participant(s), describe the method used to enter the data fusion contest, along with the results obtained. The papers will be reviewed by the organizers of the contest.
• These four top ranking teams will have their papers included in an invited session of the IGARSS 2017 conference, where the outcome of the contest will be presented. These papers will be included in the technical program, and will be included in the IGARSS 2017 proceedings.

• An IEEE Certificate of Recognition will be awarded to the same four teams during the Technical Committees and Chapter Chairs Dinner at IGARSS 2017. GRSS will cover the costs of the winning teams’ participation to the dinner.

• The same four teams will be invited to contribute to the World Urban Database and Access Portal Tools (WUDAPT) and support the implementation of their methods in open tools.

• The first and second ranking teams will co-author a paper summarizing the outcome of the competition to be submitted to the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS). A maximum of three authors per team will be included. 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. GRSS will cover the open-access fees.

• The first ranking team will be awarded a NVIDIA GPU graphics card.

ACKNOWLEDGMENT

The contest is being organized in collaboration with the WUDAPT (http://www.wudapt.org/) and Geo-Wiki (http://geo-wiki.org/) initiatives. The IADF TC chairs would like to thank the organizers and the IEEE GRSS for continuously supporting the annual Data Fusion Contest through funding and resources. They also wish to thank Ticinum Aerospace, Italy, for implementing the GRSS Data and Algorithm Standard Evaluation (DASE) website that is used for the automatic assessment of the accuracy of the submissions.


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Original Copernicus Sentinel Data 2016 available from the European Space Agency (https://sentinel.esa.int).
REFERENCES


