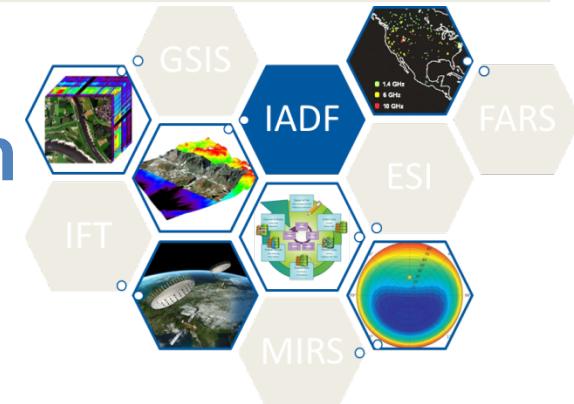




Image Analysis and Data Fusion



Bertrand Le Saux
IADF chair
Ronny Hänsch
Naoto Yokoya
IADF co-chairs



Image Analysis and Data Fusion

- **491 members in IADF TC (+97 since 01/2017)**

(incl. industry presence: *ESA, DLR, Digital Globe, Apple, Deimos Imaging, JRC, Optech, EADS Innovation, Telops Inc., A.U.G. Signals, Astrium, NASA Goddard, Mitsubishi Research, AGT international, GLOBI Hi-Tech, PCI Geomatics, MHA Technologies, Specktech, Bio-Geo-Recon, Long-Short Way Inc.,....*),

- 2159 members in LinkedIn Discussion group

Today's talk:

- IGARSS sessions and tutorials
- Publications
- Data Fusion Contest 2018
- Earth Vision 2019

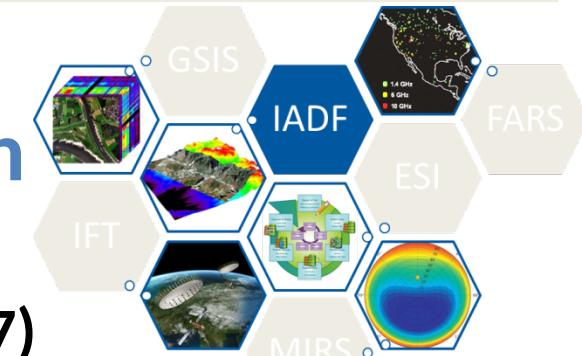




Image Analysis and Data Fusion

IGARSS sessions:

Data Fusion invited session

- 10 technical papers on “multi+” data processing (Longbotham, Pohl, Chanussot, Chehata, Liao, Sakaruda...)
- All sensors, both methodological and application-oriented topics (pansharpening, unmixing, deep learning, forest monitoring, urban detection)

Data Fusion Contest invited session

- 1 overview talk about the contest / 4 technical papers by the winners

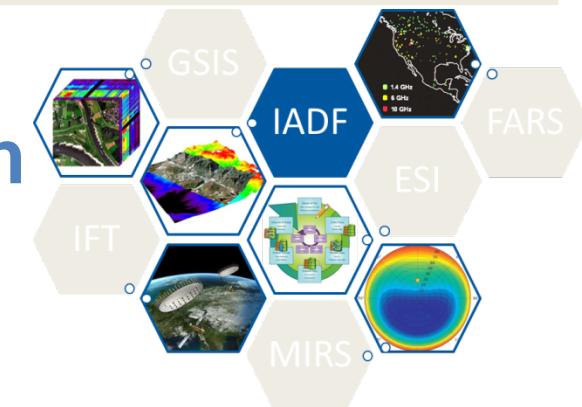
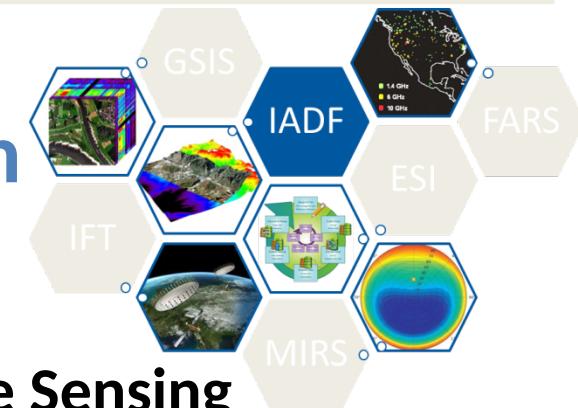




Image Analysis and Data Fusion



IGARSS tutorial on Machine Learning in Remote Sensing

- Spread good practices for data preparation
- Present efficient and advanced machine learning tools

Speakers:

Ronny Hänsch, Bertrand Le Saux, Yuliya Tarabalka, Devis Tuia



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Publications:

- **JSTARS paper on the outcome of the 2017 Contest:** accepted after minor revision, in press.
- **Column paper in GRSM announcing the 2018 Contest:** in press (March issue)

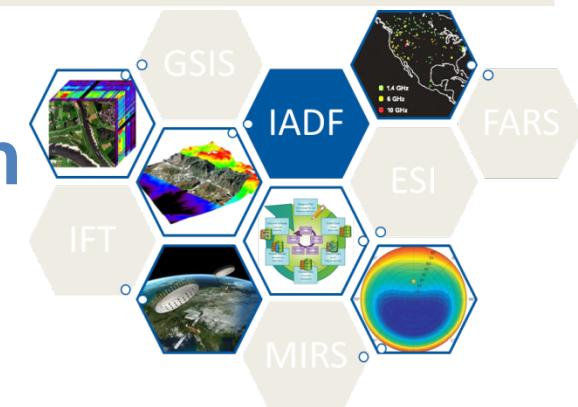




Image Analysis and Data Fusion

Ongoing activities: Data Fusion Contest 2018

- Advanced multi-sensor optical remote sensing for urban land use and land cover classification
- Guest organizer: Saurabh Prasad (Houston Univ.)



2018 IEEE GRSS Data Fusion Contest

Advanced multi-sensor optical remote sensing for urban land use and land cover classification
Get exciting data - Classify the city - Win an NDIVIA GPU

UNIVERSITY OF
HOUSTON
CULLEN COLLEGE of ENGINEERING

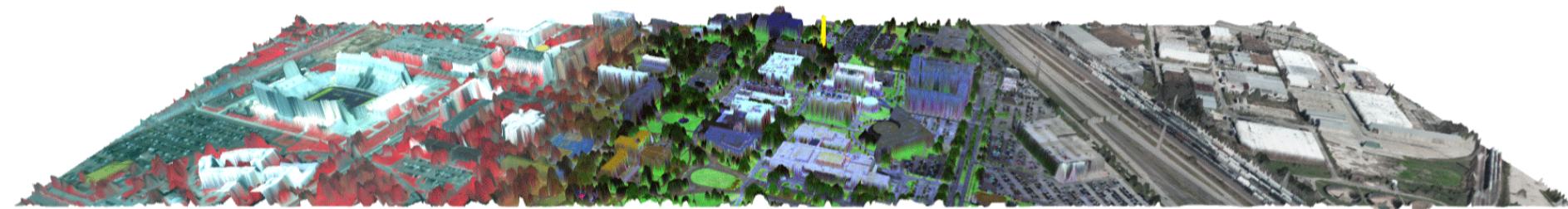
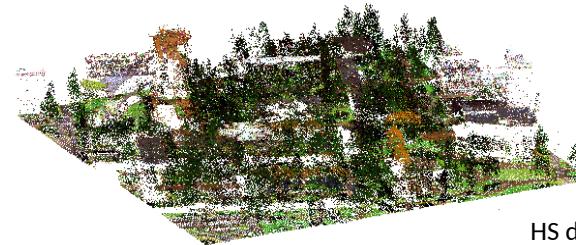


Image Analysis and Data Fusion

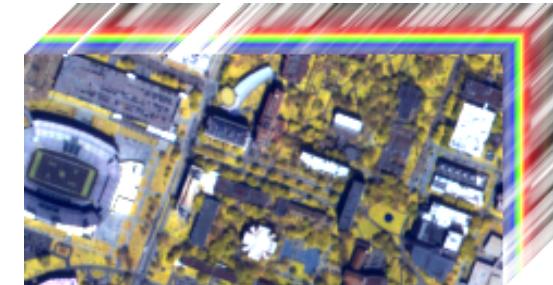
Ongoing activities: Data Fusion Contest 2018



MS LiDAR point cloud



HS data cube



- Multi-sensor data with exciting new sensors:
 - Hyperspectral imagery (**VNIR**, 1-m GSD)
 - **VHR** RGB imagery (5-cm GSD)
 - **Multispectral-LiDAR** point clouds, intensity rasters and DSMs (0.5-m GSD)

Image Analysis and Data Fusion

Ongoing activities: Data Fusion Contest 2018

- Benchmark for urban land use and land cover classification (20 detailed urban classes with materials and vegetal subclasses):

Unclassified, Healthy grass, Stressed grass, Artificial turf, Evergreen / Deciduous trees, Bare earth, Water, Residential buildings, Commercial buildings, Roads, Sidewalks, Crosswalks, Major thoroughfares, Highways, Railways, Paved / Unpaved parking lots, Cars, Trains, Stadium seats

- Data fusion and per-sensor tracks

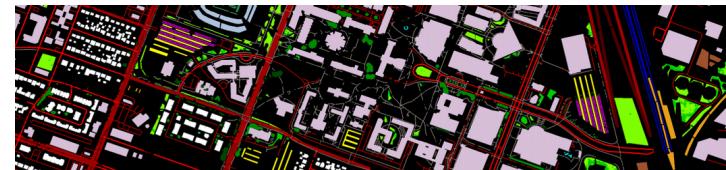
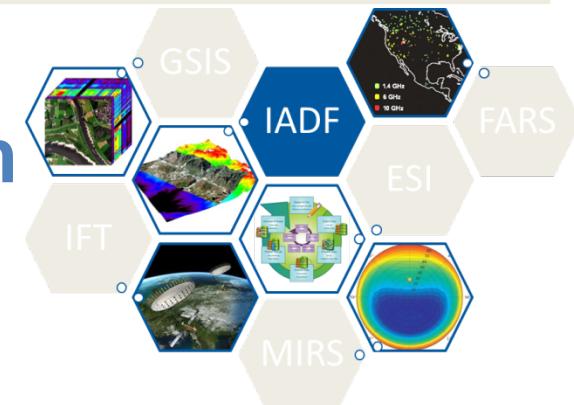




Image Analysis and Data Fusion

Ongoing activities: Data Fusion Contest 2018

Calendar:

- Training set (1.4km^2 in central Houston) was released on Jan. 15th
→ *253 downloads so far, better than 2017*
- Test set (3.5km^2) will be disclosed on March 13th
- Submission deadline on DASE is March 25th

Prizes:

- 1st to 4th teams: IEEE Certificates of Recognition + IGARSS invited session
- 1st and 2nd teams: co-author JSTARS submission
- 1st team: NVIDIA GPU graphic card

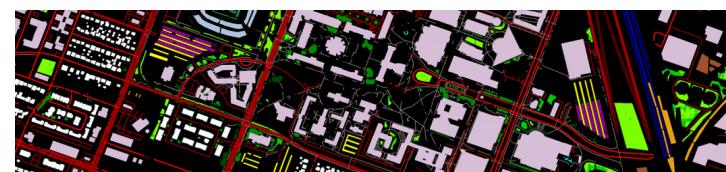
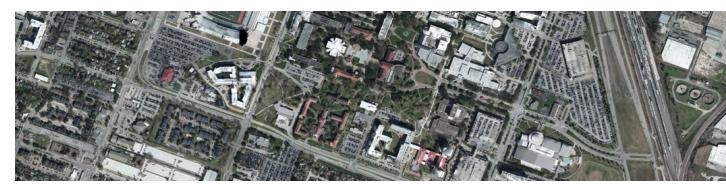
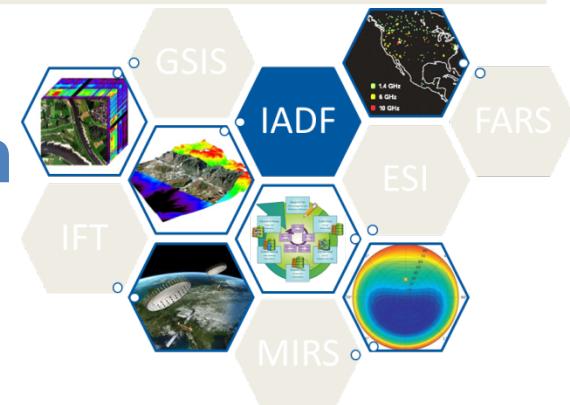
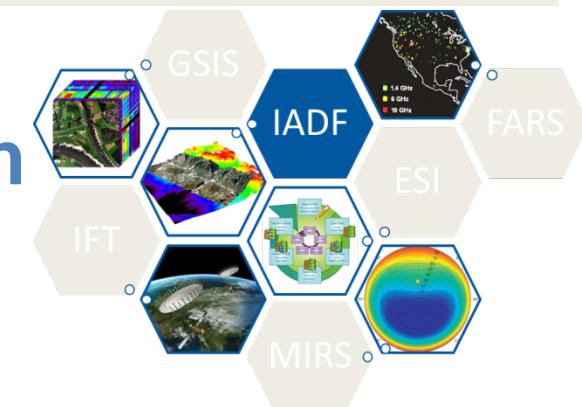




Image Analysis and Data Fusion

Ongoing activities: Data Fusion Contest 2018



Our goals:

- Explore assets/complementaries of various sensors for the same applications
- Bring together people from the technical IADF community and people working on advanced sensor development
- Make innovative and interdisciplinary applications emerge

In parallel, **GRSL special stream** for open research and novel applications with these new sensors





Image Analysis and Data Fusion

50% activities proposal: EARTHVISION'19 workshop

- Build up on the successes of EV'15 and EV'17



- Workshop proposal at **CVPR'19** (Long Beach, Cal., USA, June 16-21, 2019) (deadline: october 2018)
- Gather people and stellar keynote speakers from GRS and CV/ML, from both industry and academia
- High-quality papers: double-blind review process, high selection rate (around 25%)

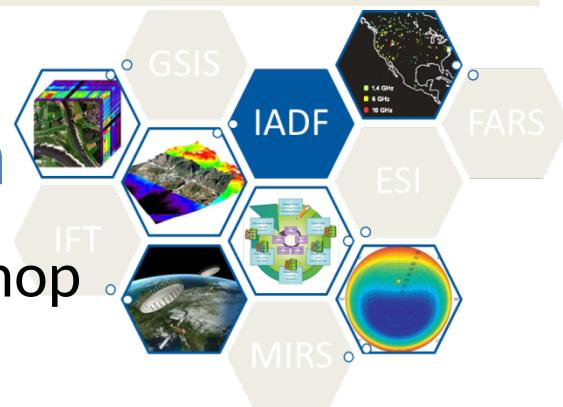
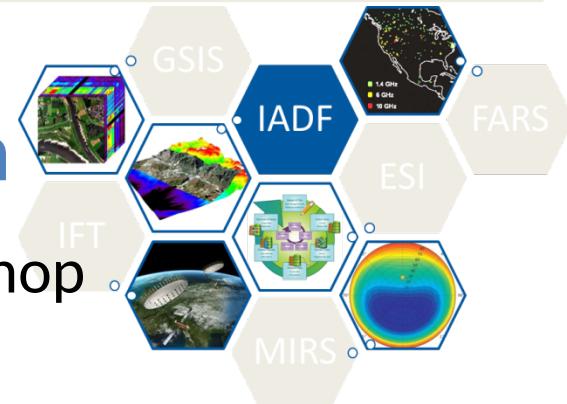




Image Analysis and Data Fusion

50% activities proposal: EARTHVISION'19 workshop



GRSS funding (\$15K) will be used to cover

Keynote speakers' expenditures

Organizers' travel expenditures (partially)

Best paper prize

Expected return of investment

Expanded GRSS membership ([Globalization](#))

Expanded participation to IGARSS and other GRSS conferences/workshops

(Education)

Increased awareness of GRSS initiatives, including DASE, in IEEE CompSoc

(Globalization / Education)

Possible evaluation metrics

Number workshop participants (by itself and as compared to 2015/2017)

% workshop participants, who are not yet GRSS members