Symposium and workshop on advances in Earth observation: Hyperspectral data analysis

10–14 July 2023
UniSC Moreton Bay campus

University of the Sunshine Coast Australia

Queensland Government | APAC Geospatial Remote sensing of the real world | SMARTSAT Cooperative Research Centre | CSIRO | काशी हिन्दू विश्वविद्यालय BANARAS HINDU UNIVERSITY | APN ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

Over the past decade, hyperspectral remote sensing has emerged as a powerful technology in remote sensing and is widely used in research areas. It provides the basic data to undertake an inventory of land as well as other resources through contiguous bands. Recent innovations in hyperspectral remote sensing offer promising techniques for natural resource monitoring and management. The main aim of this workshop is to unveil the advances in remote sensing through lectures, demonstrations and hands-on training that helps the participants gain an understanding to deal with spatial data using remote sensing tools for various applications. This workshop will also cover the demonstrations and hands-on training on tools such as R, ENVI etc for hyperspectral image analyses and their real-world applications.

Symposium program

Day 1: Monday, 10 July 2023	
9.00–9.30 AM	Registration, coffee/tea and networking
9.30–10.00 AM	Welcome to the country and program overview – **A/Prof Sanjeev Srivastava**, UniSC, Australia
10.00–10.30 AM	Welcome of Guest by University of the Sunshine Coast: **Professor Stuart Parsons**, Dean School of Science Technology and Engineering **Professor Stephan Reik**, Dean Graduate School **Dr Alex Elibank Murray**, Pro Vice-Chancellor (Global and Engagement)
10.30–11.00 AM	The SmartSat CRC: **Prof Andy Koronios**, CEO SmartSat CRC
11.00–11.30 AM	Tea break
11.30 AM-12.00 PM	EO data analytics advances in hyperspectral remote sensing: **Prof Stuart Phinn**, Director Remote Sensing Research Centre, Joint Remote Sensing Research Program, Program Leader Earth Observation)
12.00 –12.30 PM	Aquawatch mission – an EO based water quality information system for Australian water resources: **Dr Tim Malthus** CSIRO, and Monitoring and early warning of a NSW drinking water reservoir with Aquawatch EO system concept: **Dr Tapas Biswas** CSIRO
12.30 –1.00 PM	Nutrients dynamics in forest ecosystems using earth observation and ground instrumentations: **Prof A. S. Raghubanshi**, Director, Institute of Environment and Sustainable Development, Banaras Hindu University, India
1.00 –2.00 PM	Lunch break
2.00 –2.30 PM	Earth Observation Work Force: **Jasmine Muir**, SmartSat CRC
2.30–3.00 PM	About Indian Council of Agricultural Research, Remote Sensing for water and natural resources management: **Dr Gouranga Kar** Director, Central Jute and Allied Fibre Research Institute, India Remote sensing of mangrove forest and jute ecosystems in the perspective of climate induced natural hazards: **Dr Dhananjay Barman**, Sr Scientist, ICAR-CRIJAF
3.00–3.30 PM	Complementary use of Hyperspectral and Synthetic Aperture Radar (SAR) imagery **Dr Dipak Paudyal** APAC Geospatial. Advanced EO: Hyperspectral data analytics by **Dr Prashant Srivastava**
3.30 –4.00 PM	Tea break
4.00–5.00 PM	Discussions, acknowledgements, and session closure

Workshop details

Day 2: Tuesday, 11 July 2023	
9.00–9.30 AM	Registration, coffee/tea and networking
9.30–10.00 AM	Basics of Hyperspectral Remote Sensing
10.00–11.00 AM	Hyperspectral remote sensing application
11.00–11.30 AM	Tea break
11.30 AM–12.00 PM	Software in Satellite data acquisition and processing
12.00–1.00 PM	Introduction to the R language
1.00 –2.00 PM	Lunch break
2.00 –3.00 PM	Basic operations of R language
3.00 –4.00 PM	Hands-on training in R for image analysis
4.00 –4.30.00 PM	Tea break
4.30–5.00 PM	Discussions, acknowledgments, and session closure

Day 3: Wednesday, 12 July 2023	
9.00–9.30 AM	Registration, coffee/tea and networking
9.30–10.00 AM	Basics of R and Hyperspectral Image Processing
10.00–11.00 AM	Hands-on training in R for image analysis
11.00–11.30 AM	Hands-on training in R for Hyperspectral data analysis and use of different packages
11.30 AM–12.00 PM	Tea break
12.00–1.00 PM	Hands-on training in R for Hyperspectral data analysis and processing
1.00 –2.00 PM	Lunch break
2.00 –3.00 PM	Hands-on training in R for Hyperspectral data analysis for model development and classification
3.00 –4.00 PM	Hands-on training in R for Hyperspectral data analysis for regression model development and prediction
4.00 –4.30.00 PM	Tea break
4.30–5.00 PM	Discussions, acknowledgements, and session closure

Day 4: Thursday, 13 July 2023	
9.00–9.30 AM	Registration, coffee/tea and networking
9.30–10.00 AM	Introduction to ENVI and Hyperspectral Image Processing for land use/land cover and vegetation monitoring.
10.00–11.00 AM	Introduction to PRISM and hands-on in vegetation and mineral identification using hyperspectral data
11.00–11.30 AM	Tea break
11.30 AM–12.00 PM	ENVI for Hyperspectral image classification
12.00–1.00 PM	Lunch break
1.00 –2.00 PM	Hands-on training in Hyperspectral data analysis for vegetation properties
2.00 –3.00 PM	Hands-on training in Hyperspectral data analysis for minerals
3.00 –4.00 PM	Tea break
4.00 –4.30.00 PM	Discussions, acknowledgements, and session closure

Day 5: Friday, 14 July 2023	
9.00–9.30 AM	Group discussions: EO for Natural Resources Management: Aquawatch Project
9.30–10.00 AM	Group discussions: EO for Natural Resources Management: Sundarbans Project
10.00–11.00 AM	Tea break
11.00–11.30 AM	Project formulation and discussions for further collaboration
11.30 AM–12.00 PM	Lunch break

About the University of the Sunshine Coast (UniSC)

UniSC is a rapidly growing, comprehensive university focused on excellent teaching, ground-breaking research, championing sustainability, and producing award-winning alumni.

Our research explores the timeliest topics of our era, those with the most significance for the future, with a focus on:

- Health, medicine and wellbeing
- Agriculture, aquaculture and forestry
- Ecology and environment
- Human behaviour, work and society

UniSC operates across five campuses with award-winning facilities across southeast Queensland.

School of Science Technology and Engineering

The school has strong multi-disciplinary teams delivering research insights with global impact, and local and regional relevance. We offer research opportunities in key research areas across disciplines of Science, Technology and Engineering.

The venue

For many tens of thousands of years, the land that UniSC Moreton Bay is built on has been home to a number of Aboriginal clans belonging to the Turrbal, Kabi Kabi (or Gubbi Gubbi) and Waka (Waka Waka) language groups.

This area is transforming into a world-class innovation and knowledge precinct, generating jobs and providing tertiary education for local residents.

Take a virtual tour of UniSC Morton Bay campus:

Key attractions close to the UniSC Moreton Bay campus:

- Woody Point Jetty, Redcliffe – 20km
- Australia Zoo – 50km
- Moreton Bay
- Moreton Island
- Brisbane City – 30km
- Sunshine Coast – 75km
- Gold Coast – 100km

More information

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Key dates and registration

Registration deadline	Tuesday, 20 June 2023
Confirmation of participation	Thursday, 22 June 2023
How to register	Visit usc.edu.au/xx

Symposium and Workshop fees (please register separately for both events

	Symposium (10th July	**Workshop only (11-13th July)**
Students	A$75	A$400
All other participants	A$100	A$500

Register here for the symposium (10th July 2023)

Register here for the workshop (11-13 July 2023)

14th July (Day 5) is optional

International advisory committee

- Professor Eyal Bendor, Tel Aviv University, Israel
- Dr George Petropoulos, Harokopio University of Athens, Greece
- Professor Dawei Han, University of Bristol, UK
- Professor Shovonlal Roy, University of Reading, UK
- Professor A S Raghubanshi, Banaras Hindu University, India
- Dr Manish Pandey, BIT Mesra, India
- Professor Saumitra Mukherjee, JNU, India
- Dr Tapas Biswas, CSIRO, Australia
- Dr Manika Gupta, University of Delhi, India
- Dr Klaus Joehnk, CSIRO, Australia
- Professor Biswajeet Pradhan, University of Technology, Australia
- Professor S K Singh, Banaras Hindu University, India
- Dr Lu Zhuo, Cardiff University, UK
- Professor Rajendra Prasad, IIT (BHU), India
- Dr Susan Cuddy, CSIRO, Australia
- Dr Salim Lamine, University Akli Mohand Oulhadj of Bouira, Algeria
- Dr Heiko Baltzer, University of Leicester, UK
- Dr Prem Pandey, SNU, India
- Professor Onisimo Mutanga, University of KwaZulu-Natal, South Africa

Local organising committee

- Professor Kenneth Ang
- Dr Mohammad Reza Ghaffariyan
- Harikesh Singh
- Dr Dipak Paudyal
- Derek Johnson

Symposium/workshop organiser

- School of Science Technology and Engineering, UniSC
- Academic Support Unit, Research and Engagement, UniSC

Supporting organisations

- SmartSat CRC Australia
- CSIRO Australia
- IESD BHU India
- APAC Geospatial Australia
- Asia-Pacific Network of Global Change Research