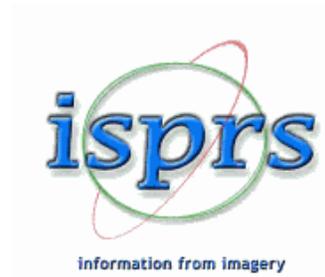# ISPRS Technical Commission V Symposium Report 2014

ISPRS Travel Grant

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1. Introduction to ISPRS TC V

The International Society of Photogrammetry and Remote Sensing (ISPRS) Technical Commission V (ISPRS TC V) deals with close-range imaging sensors and applications in the field of industrial metrology, cultural heritage, architecture, biomedical and geosciences. Close-range photogrammetry based on consumer grade and professional cameras as well as active sensors like terrestrial laser scanners, range cameras, gaming or stripe projection sensors are investigated, combined and used for 3D representations and analyses of static and dynamic objects or scenes.

Systems and algorithms for real-time imaging, mobile mapping applications and 3D modeling issues are also developed. This concentration also relates with the progressive technological development in 3 D Laser Scanner and Unmanned Aerial Vehicle (UAV) sites.

This commission is designed to meet the needs of mapping scientists at all scales. This working group is jointly funded by the donors to build, operate, maintain, and evolve a facility that will meet the current and future needs of large scale scientific computing. To meet these goals, ISPRS TC V provides common services and support, a software platform, and a set of operational principles that organizes users and resources into Professional working group as a part of ISPRS as the big picture.

1.1. Scope of works

Each Technical Commission (TC) is the important part of ISPRS principles and its model for operation. ISPRS TC V is a collection of researchers who join together to accomplish their goals; typically they share the same mission, but that is not a primary background. The ISPRS TC V actively involves in the geospatial industries nowadays to share their resources, computing and storage with the other technical group and to be able to access the resources provided by other groups as well as share data and resources with international mapping standards.

- Vision metrology systems for industrial applications
- Photogrammetric techniques for architectural, archaeological and cultural heritage applications
- Systems and algorithms for real-time imaging and mobile mapping data processing
- Integration and fusion of multiple data sources for advanced automated object extraction, recognition and modeling
- Laser scanning, range imaging, low-cost gaming sensors and other active imaging techniques for 3-D representation of static and dynamic objects and scenes
- Vision-based techniques for visualization, simulation, robotics and animation
- Photogrammetric techniques for close range morphological measurements in earth sciences
- Photogrammetric techniques in biomedical engineering and human motion studies
- Functional algorithms for close range photogrammetric orientation and object modeling

1.2. Objectives

The primary goal of this symposium is to build, integrate, test, distribute, and support a set of common software and technologies for both vendors and users.

The key to making the infrastructure work is a common package of software provided and supported by Open Geospatial Consortium (OGC). The OGC includes 3D GIS and 3D Scanner technologies with additional modules for security, storage and data management, workflow and other higher level services, as well administrative software for testing, accounting and monitoring. The needs of the domain and computer scientists, together with the needs of the administrators of the resources, services and sensors, drive the contents and schedule of releases of the OGC. The OGC middleware allows users to build an operational environment that is customized to their needs.

The OGC supports a heterogeneous set of operating systems and versions and provides software that publishes what is available on each resource. This allows the users and/or applications to dispatch work to those resources that are able to execute it. Also, through installation of the processing software, users and administrators operate in a well-defined environment and set of corresponding available services.

2. Participants:

2.1. People

This technical commission symposium was attended by 280 attendees and participants from around the globe including Japan, Indonesia, mostly from European countries.

2.2. Partner Organizations (Sponsors)

The members of the Council and List of Project Organizations / Companies
1. Association for Real-time Imaging and Dynamic Analysis (ARIDA)
2. RESHAPER
3. AICON (3D Scanner)
4. Leica Geosystems
5. Zoller+Fröhlich (ZF) Laser
6. 3DFLOW
7. ARCTRON
8. nFrames
9. RIEGL

3. Activities and Findings:

3.1. Oral Session

ISPRS TC V provides an infrastructure that supports a broad scope of scientific research activities, including the major geoinformatics collaborations, cultural heritage, biological sciences, applied mathematics, engineering, and computer science and, through the engagement program, other non-geoinformatics research disciplines.

Figure 1. Presentation during Joint TS WG2 & ICWG 1/5b

ISPRS TC V continued to provide a platform for research activities that deploy and extend advanced distributed computing technologies in the photogrammetry and geoinformatics areas with direct implementation to the cultural heritage conservation.

The presented oral session strives to provide a software stack e.g. Agisoft Photo Scan that is easy to install and configure even though it depends on a large variety of complex software such as PCI Geomatics.

3.2. Poster Session

- Scientists and researchers can successfully use a heterogeneous computing infrastructure with job throughputs of more than 25,000 CPU days per day (an increase of an average of 5,000 CPU days per day over the last six months), dynamically shared by up to ten different research groups, and with job-related data placement needs of the order of Terabytes.

- Many communities are facing the same challenges as OGC in educating new entrants to get over the threshold of understanding and benefiting from distributed computing.

Participants greatly benefit from 3D Laser Scanner demonstrations, as well as the information services and probes that provide OGC role usage and site information to the user application layer and to the ARIDA for review of compliance with cooperation agreements.

Figure 2. Poster Session during ISPRS TC V Symposium

3.3. Networking and Socialization

Training and outreach to campus organizations, and the development of the next generation of computational scientists is a core part of the ISPRS TC V program. The workshop about education and training program brings domain scientists and computer scientists together to provide a rich training ground for the engagement of students, faculty and researchers in learning the UAV infrastructure, applying it to their discipline and contributing to its future development.

Figure 3 Social dinner table

4. Publications

4.1. Annals publications

ISPRS TC V Symposium provided 52 annals which can be accessed immediately after the symposium with a concentration on photogrammetric (including LiDAR), laser scanner as well as its implementation in the field.

4.2. Archives publications

In parallel, publications consist of 93 archives also have been put for the public consumption with a topic concentration ranging from UAV technologies, point cloud data processing and mapping purpose. The topic about "UAV data processing for Large Scale Topographical Mapping" has been presented at the end of the first symposium day (Figure 1. Presentation during Joint TS WG2 & ICWG 1/5b).

5. Concluding Remarks

ISPRS Technical Commission V has actively involved in the collaboration and actualization of photogrammetry and geoinformatics aspects with other non-technical discipline i.e. Cultural Heritage Conservation activities.

The opportunity to deliver oral presentation of my research paper exposing Borobudur Temple in Indonesia was really a good advantage in order to disseminate current activities nearby starting from 2013 up to now.

As a suggestion it would be good if the waiver of symposium registration fee can be provided as a helpful support for the travel grantees in the future, especially for student participants.