News**Letter**

ISPRS
Student
Consortium

Free and Open Source Software
for Geomatics

Interview
with
Dr. John Trinder

IT News

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ISPRS SC NewsLetter

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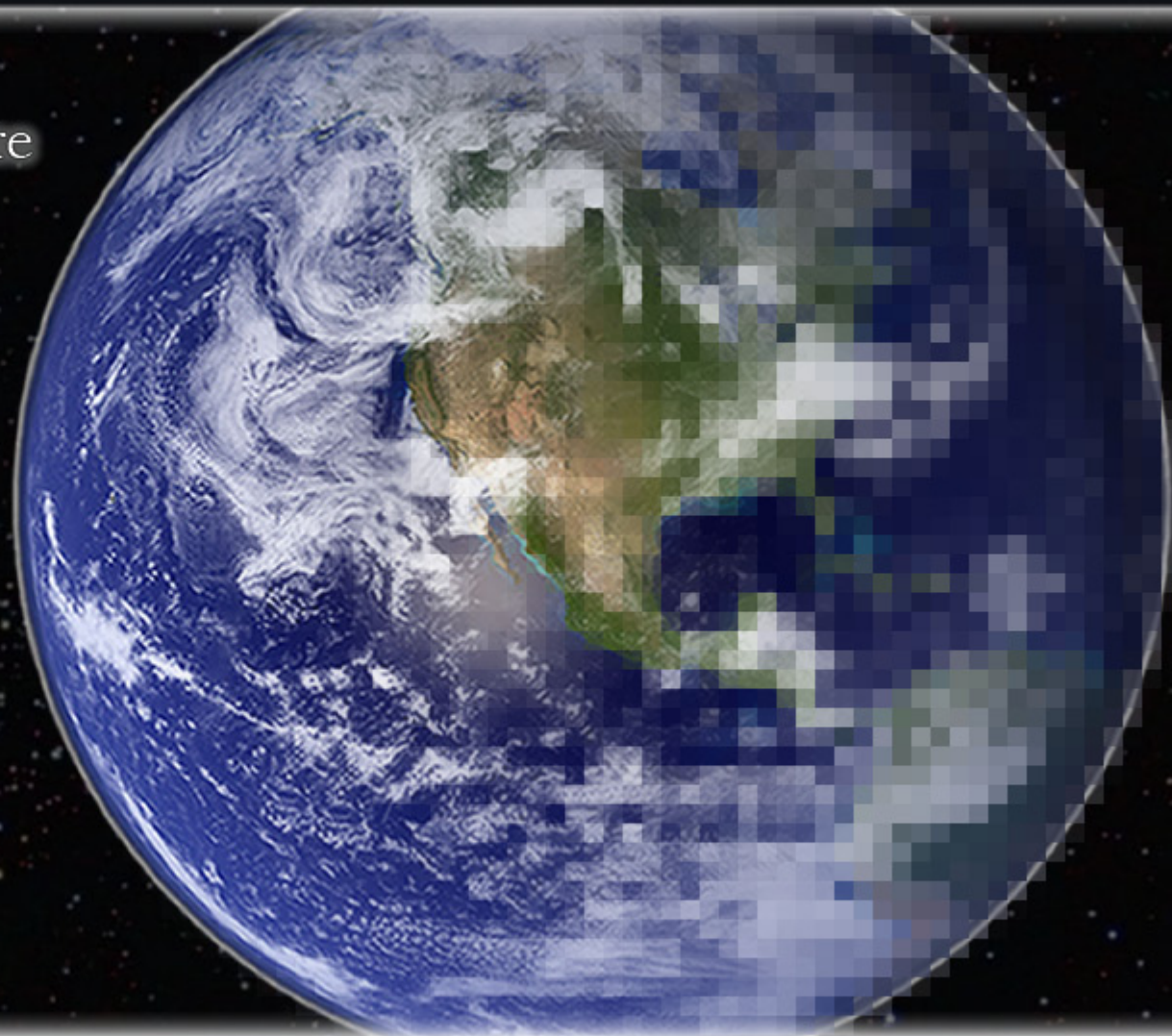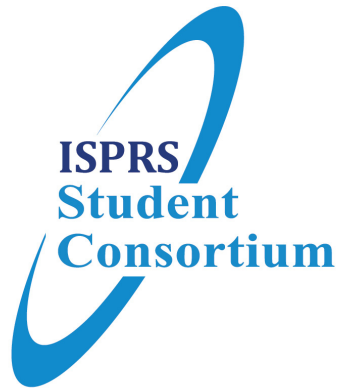
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Would you like to join SC Newsletter team? Do you want to make a difference? Want to learn new skills?

SC Newsletter is at a stage where getting broader and better demands more people to be involved in the process of it's formation. That's why SC Newsletter team is looking for the following volunteers:

- More **people who would be willing to prepare articles** for existing or new rubrics,
- Designers of Newsletter,
- **English native speakers** for proof reading.

If you can help us with any of the above, please let us know!

info@isprs-studentconsortium.org

And also...
If you **would like to publish your research work** in the SC Newsletter send us your abstract on email written above. We will soon contact you for further information.

Dear Friends,

The countdown for the ISPRS Melbourne Congress has begun. The recent research and scientific progress achieved since 2008 in the fields of ISPRS will be presented during the event. The Congress consists of several technical and social meetings including a long day Youth Forum and all week long social activities for SC.

On the other hand, it is time to evaluate the past four years of ISPRS Student Consortium activities. We received a great response to our calls of online survey participation. The survey results will provide what has been appreciated most by our members since 2008 but also will give clues in which directions SC should continue in order to meet the needs of our peers. I would like to thank to the ones who spent their valuable time for a better SC. The results will be published online and presented during the Melbourne Congress.

In addition to the current efforts, SC is seeking new members and volunteers to carry the flag in the next term. The current SC Board will hand over the mission to the elected Board during the General Assembly during the Youth Forum. If you are willing to for such volunteer activities within the SC Network, we will be glad to hear more from you and your ideas with possible contributions for the next term.

Looking forward to meeting you in Melbourne!

Best Regards,
Cemal Özgür KIVLCIM
Chair

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Interview
by Urša Kanjir

Dr. John Trinder

Dr. John Trinder is an emeritus professor of Photogrammetry and Computer Assisted Mapping in the School of Surveying and Spatial Information Systems at the University of New South Wales in Sydney, Australia. He was president of ISPRS from 2000-2004, and has been actively involved with the organization before and after these years. He is also an honourary member of ISPRS. Among other awards he has won for his research papers, he was awarded the Spatial Sciences Institutes's Eminent Persons Award in Australia in 2004.

Can you explain us what is your research field (what are you working on) at the moment?

I have a research project with another staff member at the School of Surveying and SIS at UNSW as well as with a qualified forester with experience in lidar, on developing software for processing airborne lidar for analyzing forest parameters. This can be applied in in the future to forestry applications that use full waveform lidar. As well, I have several postgraduate students studying machine learning techniques for extracting information from spaceborne and aerial images together and combining it with lidar data. We are also working on several aspects of full waveform lidar for forest parameter characterization, including theoretical studies of multiple reflectances of lidar signals in vegetation.

Why did you decide for this profession in the first place (maybe you can tell us something more about your first steps)?

One's career options can never be predicted. I started off being a land surveyor, with the thought that I liked working in the open air. This suited me until I became qualified, but then I looked for further study options because I wanted to learn more than I had learned in my undergraduate degree. I was fortunate to win a scholarship to study photogrammetry at ITC in the Netherlands, which meant that I was set for a career path in photogrammetry. Perhaps in today's language it should be referred to as 'a career path in satellite and aerial imaging'. Following the completion of my MSc at ITC, I was offered a position at lecturer at UNSW,

which included PhD studies and ultimately resulted in my being appointed as Professor and Head of School of Surveying and SIS. Having directed my career path to photogrammetry, also led to my interests in remote sensing, although I have concentrated my work more in photogrammetric aspects. Therefore you can never predict how your career options will develop, but you should always grasp the opportunities that are presented to you.

What advices would you give to students and young professionals regarding successful career?

• Grasp all opportunities that become available and can improve your career.

• Take every opportunity to learn from your superiors

• Continue to develop your knowledge, since methods and technologies are changing rapidly in the spatial information fields. This includes attending conferences such as ISPRS, Summer Schools etc.

In your opinion how important is participation of young people to international professional events like Summer schools, Congresses, workshops, etc? What do you think are the benefits of such activities to youth and to profession?

As I said above, I think it is very important. It is at these events that you hear of the latest developments in technologies and methods used in photogrammetry, remote sensing and spatial information sciences. It is how you learn about what other researchers are doing

and you can discuss your outcomes with them. I have attended every ISPRS Congress since the 1972 event in Ottawa, Canada and I am sure this has benefited my career.

What are the most important recent developments in remote sensing and GIS in Australia? In which domain is there an emphasis at the moment?

There is an active private sector in Australia which is responsible for the majority of surveying and mapping, including GIS data acquisition and management. The private mapping industry is small but very active especially because of the rapid developments in mining. This work now uses the latest digital cameras for orthophoto production. The acquisition of lidar for DEM determination as well as for forest management is also growing rapidly. A range of remotely sensed data is now being collected for environmental management purposes including for carbon accounting. CORS networks based on Global Navigation Satellite Systems (GNSS) are developing throughout the country and hence GNSS systems are becoming an integral part of positioning.

A range of topics is being researched at universities. Information extraction from aerial and satellite imagery is being studied for map updating. GIS is being studied in relation to a number of applications, including implications of position in medicine. An important source of research funds is the Cooperative Research Centre for Spatial Information (CRC-SI) which is located in Melbourne, and research is being undertaken under its auspices in most states in Australia and in New Zealand. The research undertaken in this Centre is application oriented and it involves a significant number of companies (SMEs – Small and Medium Enterprises). It also has links to overseas research groups.

This year Australia, Melbourne, will host 22nd ISPRS Congress. Is this reflected on your everyday work, since your country will host the most important event of the profession?

I was not called on to assist with the management of the ISPRS Congress in the early days. However, I became involved from about the middle of last year because I was elected as Chair of the Remote Sensing and Photogrammetry Commission of the Surveying and Spatial Science Institute (SSSI) in Australia. Also, the 16th ARSPC, the two yearly Australian Remote Sensing and Photogrammetry Conference, will also be held in conjunction with the ISPRS Congress, so I have a close interest in the management of the whole event and am now on the management committee. I certainly hope that the whole event is a great success and that as many students as possible can visit Melbourne for this important event.

Free and Open Source Software for Geomatics

by Thanasis Moysiadis
(Department of Planning and Regional Development, University of Thessaly)

Free and open source software is appreciated by many geoscientists for educational and research purposes. This is mainly due to the ease of use, the functionality, the free-use status and in most cases the non-cost of such software. The rapid advancement of computer technologies leads towards cheaper and more sophisticated geospatial solutions. Most of the processing in photogrammetry, remote sensing, geographical information systems and in other earth-related disciplines, depends directly on the technological advancement and use of special software. Software is needed to collect, process and analyze geospatial data and to validate its results.

The aim of this article is to distinguish the types of free/open source software that can be used to best effect for educational or research purposes, rather than enumerating the existing ones available. Proprietary software, namely commercial software, exists to support the aforementioned disciplines but it has strict license and distribution criteria. Nevertheless, universities, educational institutes, companies and individuals often fail to financially support such software. In this case, free and open source software provides nearly the same capabilities at no cost. Even though they may not fully cover the functionality and processes of proprietary software, they support a series of analytical processes.

Free software means free-use status rather than non-cost software. This means that the user is able to process, analyze, edit, modify and distribute such software. Usually, free software is characterized according to the following main criteria:

- use of the software regardless of the aim of the research project
- study of the way of use of the software according to the user's needs - access to the source code is essential
- modification of the software and ability to publish it in the research community - access to the source code is essential
- ability to publish it redistribute copies of the software

Each user is entitled to the above actions either privately or publicly without any prior notice, license or authorization. Free software does not necessarily mean non-commercial software; therefore, it can be commercially used and distributed. It is sometimes the case that national regulations prevent users from copying and distributing such software. As already mentioned, modifications to free software are being made, provided that the source code is available. Frequent code modifications usually include free modules merged into the software. If the license policy does not provide the user with copyright authorization, this is not free software. Software manuals are free to download since they form an irreplaceable part of the software.

Referring to free software, descriptions such as "open" or "for free" should be avoided, since they imply the cost rather than its use.

Open source software is not the same as free software because open source does not necessarily mean for free, and in some cases their licenses are restrictive. Therefore, open source software does not comply with the above criteria for free software. Almost all free software is open source and almost all open source software is free.

A reference is made to other kinds of software for a comparative evaluation according to the user's needs.

- Public domain software describes those without any license or copyright. This means the software is not patented. Since the source code is in the public domain, this is a special category of non-patented free software.
- Non-free software describes software whose use is not for free, the so-called semi-free and proprietary software.
- Semi-free software describes software whose use is not for free; however, its license allows a personal use for distribution or modification purposes.
- Proprietary software describes software whose use is not for free or semi-free. Its use, distribution or modification is strictly forbidden without prior license.
- Freeware software can be distributed but not modified, since the source code is not available. Therefore, it is not free software.
- Shareware software is licensed software, distributed to the users for a specific time period. After that period a cost is charged.

The main differences between free and open software as well as the benefits of using them in the educational or commercial sector are outlined. A comparison is made with other software categories to pinpoint the differences before incorporating them into research or educational activities in Geomatics.

References

1. Lemmens M., 2011. Geo-information: Technologies, Applications and the Environment, 1st ed., Springer.

2. Open Source Initiative, http://opensource.org.

3. The Open Source Geospatial Foundation, http://www.osgeo.org.

GeoPlace
http://www.geoplace.com/

Ocean Motion
http://oceanmotion.org/

RESOURCES
NOAA's Climate Data Online
http://www.ncdc.noaa.gov/cdo-web

EDUCATION
UNIGIS International
http://www.unigis.net/

Object-Oriented Programming with C++
http://ocw.usq.edu.au/course/view.php?id=13

FREE SOFTWARE
Next ESA SAR Toolbox (NEST)
http://nest.array.ca/web/nest

JOBS, CAREER OPPORTUNITIES
indeed
http://ca.indeed.com/

RS Experts for SkyBox Imaging
http://www.skyboximaging.com/jobs

JOURNALS
Journal of Coastal Zone Management
http://www.aprh.pt/rgci/index_eng.html

LBx Journal
http://www.lbxjournal.com/

RELATED ORGANIZATIONS, ASSOCIATIONS
3D Professional Association
http://www.3dprofessional.org/

**IAVS - International Association for Vegetation Science**
http://www.iavs.org/

EdgeWise Plant 3.0

ClearEdge3D released EdgeWise Plant 3.0 with six major new features to optimize and accelerate 3D modeling workflows. The software automates the extraction of complex CAD pipe geometry from 3D laser scanned data, reducing the time needed to create accurate as-built 3D models of process plant facilities. EdgeWise can process numerous formats including: .fls, .ptx, .ptg, .zfs, .rsp, and .rxp

The new features include:
- 64-bit, multi-core processing extracts pipes up to 12X faster
- New QA tools validate the accuracy of your model
- Improved extraction algorithms automatically model nearly the entire scene—even the small pipes
- Automatic connection tools allow for quick completion of occluded and missed pipes
- New SmartSheet™ technology extracts key pipe intelligence in an easy-to-edit worksheet
- Export pipes to layers or levels in AutoCAD, MicroStation or Cyclone

Read more: http://www.clearedge3d.com/Products.aspx?show=EdgeWisePlant
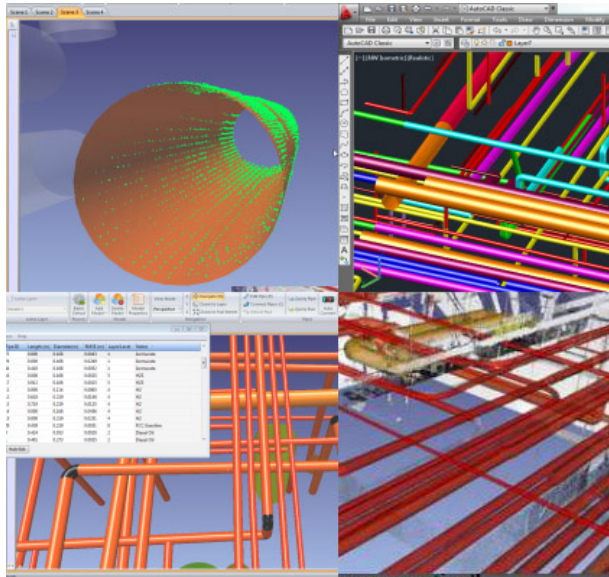
VRMesh v7.0 Survey

Key features of VRMesh Survey empower users to:
- Automatically classify LiDAR point clouds with high accuracy.
- Extract building footprints and create 3D buildings in one click.
- Detect powerlines and conduct a clearance analysis.
- Create a grid surface or an accurate meshed surface from point clouds.
- Import and export the shape file.
- Batch process multiple files.

The VRMesh v7.0 Survey module has taken a significant step forward in the new release. The major enhancements include:
- It adds the ability to automatically extract building footprints and create 3D building models.
- It adds several commands to detect and analyze power lines.
- It enables users to directly create grid surface on point clouds.
- The shape file format is supported.
- The capability of importing large data set is enhanced.
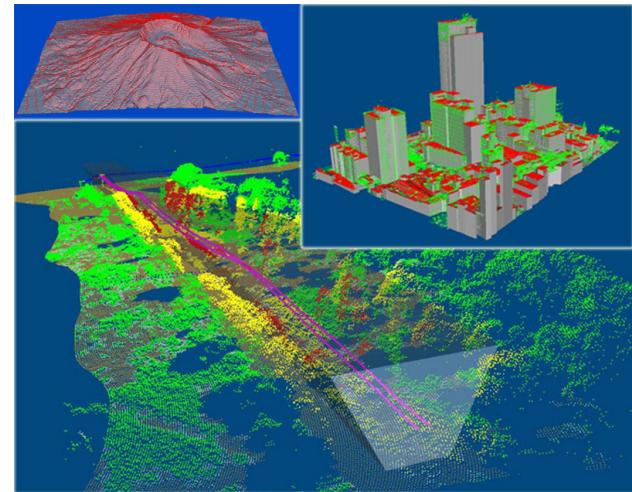
Full waveform hyperspectral LiDAR for terrestrial laser scanning

We present the design of a full waveform hyperspectral light detection and ranging (LiDAR) and the first demonstrations of its applications in remote sensing. The novel instrument produces a 3D point cloud with spectral backscattered reflectance data. This concept has a significant impact on remote sensing and other fields where target 3D detection and identification is crucial, such as civil engineering, cultural heritage, material processing, or geomorphological studies. As both the geometry and spectral information on the target are available from a single measurement, this technology will extend the scope of imaging spectroscopy into spectral 3D sensing. To demonstrate the potential of the instrument in the remote sensing of vegetation, 3D point clouds with backscattered reflectance and spectral indices are presented for a specimen of Norway spruce.

(Read more)

A Swarm of Nano Quadrotors

Experiments performed with a team of nano quadrotors at the GRASP Lab, University of Pennsylvania. Vehicles developed by KMel Robotics. Special thanks to Professor Daniel Lee for his support.

(Read more)

The Balloon and the Lidar

Ignite talk given by by Ben Brooks.
From the Ignite session at the 2012 UNAVCO Science Workshop. February 29, 2012.

(Read more)

DARPA Legged Squad Support System (LS3)

Video 1
Video 2

1st Annual ASPRS SAC Summer Conference

"Multi-source Geospatial Data Fusion"
June 10-16, 2012, George Mason University Campus, Fairfax, Virginia

This summer conference for students will consist of lectures by professionals of industry and academia on geospatial theory, data fusion, conflation, and integration, geospatial technology, and geospatial analysis. This is a rare and exciting opportunity to meet and network with other students in the field and professionals in the industry.

(Read more)

How algorithms shape our world

Kevin Slavin argues that we're living in a world designed for -- and increasingly controlled by -- algorithms. In this riveting talk from TEDGlobal, he shows how these complex computer programs determine: espionage tactics, stock prices, movie scripts, and architecture. And he warns that we are writing code we can't understand, with implications we can't control.

(Read more)

7th International Conference on 3D GeoInformation
Quebec City, Canada, 16-17 May 2012
For more info visit the website.

32nd EARSeL Symposium "Advances in Geosciences"
Mykonos Island, Greece, 21-24 May 2012
For more info visit the website.

EU User Meeting 2012 for laser scanning and 3D Documentation
Zurich, Switzerland, 22-23 May 2012
For more info visit the website.

EORSA 2012 Earth Observation and Remote Sensing App.
Shanghai, China, 8-11 June 2012
For more info visit the website.

Int. Summer School on Mobile Mapping Tech.
Tainan, Taiwan, 11-15 June 2012
For more info visit the website.