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**Report on the
3rd IEEE/GRSS-Young Professionals & 16th ISPRS Working Group V/5 and
Student Consortium Summer School 2017**

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The **3rd IEEE/GRSS-Young Professionals & 16th ISPRS Working Group V/5 and Student Consortium Summer School** was held at the Centre of Agroveterinary Sciences of the Santa Catarina State University, Lages city, Santa Catarina State, Brazil from October 2nd to 6th, 2017. Lages is the main city in the Santa Catarina Southern Plateau, and large grassland fields and the last remaining mixed ombrophilous forest remnants can be found there. Several vast cattle ranches, which are nowadays used for rural tourism, can be also found in the area, where the modern “gaúchos” still keep the traditions and skills of their forebears alive. The region nearby also boasts various spectacular natural beauties such as Serra do Rio do Rastro, Serra do Corvo Branco, São Joaquim National Park, and Coxilha Rica, among other places.

The major themes of the **3rd IEEE/GRSS-Young Professionals & 16th ISPRS Working Group V/5 and Student Consortium Summer School** were related to **Multivariate Statistics, Introduction to Laser Scanning, and Image Processing with Google Earth Engine**. The proposed event was possible due to collaboration between two well-known scientific societies, the IEEE - Geoscience and Remote Sensing Society (GRSS) and the International Society for Photogrammetry and Remote Sensing (ISPRS). The latter is supported by the Student Consortium (ISPRS SC) that is the official representation of the students and the youth to ISPRS. The main objectives of the ISPRS SC are to link students, young researchers and professionals in different countries, who are interested in photogrammetry, remote sensing and spatial information sciences. ISPRS SC also aims to provide a platform for exchange of information and to organize student-specific events and other activities that integrate students and the youth more effectively into ISPRS activities. The above mentioned event was also financially supported by the Foundation for the Support of the Scientific and Technological Research of Santa Catarina State (FAPESC).

A total of one hundred and three registered participants attended the above mentioned event (Fig. 1). They were originally from 19 different institutions (universities, research institutes, armed forces and governmental agencies). The majority of the participants were graduate students (both MSc and PhD levels) and they comprised 75% of the attendees. Undergraduate students comprised 10% of the participants, whereas professionals, working at different universities, research institutes, armed forces and governmental agencies comprised the remaining 15% of the audience.

The **3rd IEEE/GRSS-Young Professionals & 16th ISPRS Working Group V/5 and Student Consortium Summer School** event was organized in two blocks. The first block, lasting three days (October 2nd to 4th), followed the model of the **ISPRS Student Consortium Summer School (ISPRS-SC)**. The aim was to transmit technical/scientific knowledge on selected topics. In this block, intensive lectures were delivered by renowned speakers with great technical and scientific experience in this field.

The above mentioned event was started by a short opening ceremony conducted by Prof. Dr. Veraldo Liesenberg. A round table discussion was initiated with representatives of the University (Prof. Dr. Marcos B. Schimalski, Prof. Leonardo J. Biffi, Prof. Dr. Adelar Mantovani, and Prof. Dr. Alessandro B. Cunha), the IEEE/GRSS Brazilian Chapter (Prof. Dr. Raul Feitosa) and the ISPRS V/5 council (Prof. Dr. Antonio M.G. Tommaselli). Afterwards, three key-note speakers were invited to deliver high-level lectures on specific topics. The key-note speakers were Prof. Dr. Norbert Pfeifer from the Technische Universität Wien (TU Wien, Austria) who is a well-known expert on LiDAR and photogrammetry. Additionally, Prof. Dr. Anselmo Chaves Neto from the Federal University of Paraná (UFPR) delivered talks on Multivariate Statistics applied to pattern recognition and automation. Finally, Prof. Dr. Héctor Jaime Hernández Palma from the Universidad de Chile (UC, Chile) a well-known scientist in the field of digital image processing using the Google Earth Engine ended the Summer School delivering the remaining talks. The lectures were delivered at specific intervals and after each lecture an additional session was planned with the collaboration of professionals in order to promote discussion with the audience. A coffee break was offered twice per day. The coffee breaks happened during both morning and afternoon sessions in which nine posters from students were presented.

It is important to mention that the **16th ISPRS Working Group V/5 and Student Consortium Summer School** also offered daily social events, on the basis of voluntary participation. On Monday, the social event took place at the “Galpão Gaúcho” in which the interested participants were able to appreciate traditional dishes from the region. The most famous dishes are those prepared with the nuts from the Brazilian pine (i.e., *Araucaria angustifolia* (Bertol.) Kuntze). On Tuesday, the social event resumed with a degustation of high-altitude grape varieties, i.e., wines made from grapes

harvested from vineyards located at over 1300 meters above sea level. The degustation was harmonized with different cheeses, also produced in the region. On Wednesday, in order to celebrate the success of the first block, traditional beers brewed in the region were appreciated at the famous “Boteco Santa Fé”.



Figure 1. Group picture of the participants taken on the third day of the event.

The second block, lasting two days (October 5th-6th), followed the model of the **IEEE/GRSS Young Professionals (IEEE/GRSS-YP)**. This event was intended to guide the careers of Young Professionals who graduated up to 10 years previously, as well as both graduate and undergraduate students. The event consisted of lectures, as well as interactive sessions delivered and moderated by prominent professionals active in business, education/research institutions and academia. The morning session was started with a short opening ceremony mediated by Prof. Dr. Veraldo Liesenberg. A round table was established with representatives of the University (Prof. Dr. Marcos B. Schimalski, Prof. Leonardo J. Biffi, Prof. Dr. Adelar Mantovani, Prof. Dr. Alessandro B. Cunha), the FAPESC (Prof. Dr. Sergio L. Gargioni), the IEEE/GRSS Brazilian Chapter (Prof. Dr. Raul Feitosa) and the ISPRS V/5 council (Prof. Dr. Edson A. Mitishita) (Fig. 2A). The opening ceremony was followed by a guitar performance by the undergraduate student Mr. Marlus Pereira (Fig. 2B). Mr. Pereira delivered an impressive performance by playing guitar and singing typical songs from the “Gaucho’s Culture” in both Portuguese and Spanish languages.

The first session of the **3rd IEEE/GRSS Young Professionals (IEEE/GRSS-YP)** event consisted of four lecturers. The first talk was delivered by Prof. Dr. Norbert Pfeifer from the Technische Universität Wien (TU Wien, Austria) with the topic “Remote Sensing Career Paths - Examples from Europe”. After the talk, Prof. Dr. Raul Q. Feitosa, a representative from both the Rio de Janeiro State University (UERJ) and the Pontifical Catholic University of Rio de Janeiro (PUC-Rio), started

moderating questions and concerns from the audience. The second talk was delivered by Dr. Lênio S. Galvão from the Brazilian Institute for Space Research (INPE) with the topic “Earth Observation Satellites and associated scientific production: advances and perspectives”. This talk was moderated by Prof. Dr. José Marcato Júnior from the Federal University of Mato Grosso do Sul (UFMS). The participants were then invited for the coffee break and poster session. Afterwards, Prof. Dr. Sergio L. Gargioni, currently the President of the Foundation for the Support of the Scientific and Technological Research of Santa Catarina State (FAPESC) delivered a talk entitled: “The Role of the State Government Research Foundations in the relationship among University, Industry and Society”. This session was moderated by Prof. Dr. Veraldo Liesenberg from the Santa Catarina State University (UDESC, Brazil). Afterwards, the morning session was closed by Prof. Héctor Jaime H. Palma from the Universidad de Chile (UC, Chile) with the talk: “Remote Sensing Applications in Chile”. This session was moderated by Prof. Dr. Edson A. Mitishita from the Federal University of Parana (UFPR, Brazil), and there was then an interval for lunch.

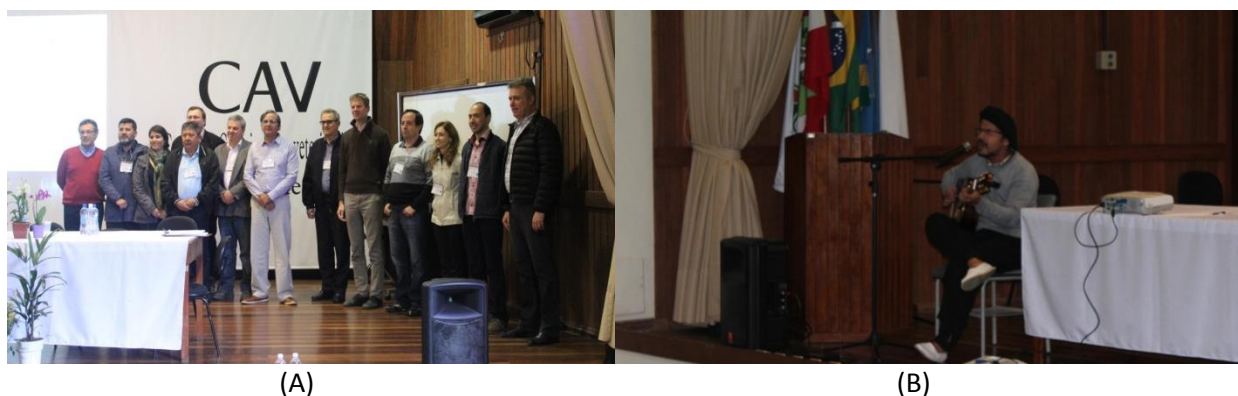


Figure 2. Group picture of the lecturers from the event (A), and a picture of the guitar performance of the undergraduate student Mr. Marlus Pereira (B).

The afternoon session of the **3rd IEEE/GRSS Young Professionals (IEEE/GRSS-YP)** event was started with Prof. Dr. Edson A. Mitishita from the Federal University of Parana (UFPR, Brazil) with the talk: “The Brazilian Geotechnology Market: Challenges and Opportunities”. The talk was moderated by Prof. Leonardo J. Biffi from the Santa Catarina State University (UDESC, Brazil). This talk was followed by a lecture from Prof. Jefferson A. dos Santos from the Federal University of Minas Gerais (UFMG, Brazil) with the presentation entitled: “Machine Learning Methods for Remote Sensing Image Analysis: Challenges and Opportunities”. This talk was moderated by Prof. Dr. Vagner A. Pesck from the Paraná Midwestern State University (Unicentro, Brazil). After the coffee break, Dr. Marcus V.N.D. Oliveira from the Brazilian Agricultural Research Corporation (EMBRAPA-Acre) delivered a talk entitled: “Remote Sensing Applications for the Sustainable Forest Management in the Brazilian Amazon”. This session was moderated by Dr. Alessandra R. Gomes from the Amazon Regional Center

(CRA), a research unit that belongs to the Brazilian National Institute for Space Research (INPE). By request of the local organizers, an additional group of 37 undergraduate students, mostly attending the courses of Forest Inventory, and Forest Management also attended this specific talk and joined the audience. Afterwards, the afternoon session was closed by Dra. Claudia M. de Almeida from the Brazilian Institute for Space Research (INPE) with the talk, “State of the Art and Perspectives of Simulating Land Use and Land Cover Changes using Remotely Sensed Images”. The session was moderated by Prof. Dr. Marcos B. Schimalski from the Santa Catarina State University (UDESC, Brazil). Last, but not least, the **3rd IEEE/GRSS Young Professionals (IEEE/GRSS-YP)** also offered a social event on the basis of voluntary participation. The participants were invited to enjoy fish dishes at the “Galpão Capão do Cipó”, a famous restaurant in the city of Lages.

The last day of the event consisted of a talk delivered by Prof. Raul Q. Feitosa from both the Rio de Janeiro State University (UERJ) and the Pontifical Catholic University of Rio de Janeiro (PUC-Rio). The talk highlighted the topic “The Importance of Scientific Societies in the Construction of the Research Groups”. During his talk, an announcement of eleven travels grants was given to the audience (Fig.3A). All the students were invited afterwards to receive their travel grant award (Fig. 3B).



Figure 3. Announcement of the Travels Grants by the GRSS Brazilian Chapter Secretary Dr. Patrick N. Happ (PUC-Rio) (A) and group picture of the students granted travel awards by the event (B).

After the announcement, a closing discussion was initiated with the local organizers and all the lecturers of the event, promoting a very in-depth discussion with the audience under the topic: “How to Build a Professional Career: Challenges and Opportunities”. During the closing ceremony, the forthcoming activities for the next year were announced. Unexpectedly, the students who helped in the local organization requested permission to show a short video containing some pictures of the event and acknowledging the audience for their visit and also the lecturers and tutors for the very interesting experience. The video made by the volunteer students can be accessed under the following URL:

<https://www.youtube.com/watch?v=X4myg6WuuQw&t=9s>

There was a final coffee break and afterwards a demonstration of different equipment from both FARO and Leica Brazilian representatives in the field. Certificates of participation were awarded to the participants by e-mail after the event. A list of exercises was made available to the students interested in obtaining ECTS credits in their graduate programs. Based on the delivery of an adequate report, the students will be awarded with three ECTS credits from the Graduate Program of Forest Engineering.

In conclusion of this report, we would like to sincerely acknowledge all the support given by both the IEEE - Geoscience and Remote Sensing Society (GRSS) and the International Society for Photogrammetry and Remote Sensing – Student Consortium (ISPRS-SC). A special acknowledgement is also due to the financial support given by the Foundation for the Support of the Scientific and Technological Research of Santa Catarina State (FAPESC). This event would not be the same without all this generous support.

Thank you very much!

Sincerely,

Veraldo Liesenberg, Marcos B. Schimalski, and Leonardo J. Biffi