

IGSM 2014 - Brief Description Report

From 25th June to 1st July

Event: International Geodetic Students Meeting

Location: Istanbul, Turkey

Prepared by:

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Sponsored by:

F2Geos

Verein Freunde des Studienganges Geodäsie
und Geoinformatik an der Universität
Stuttgart e.V.

itü



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Acknowledgement

This document represents a brief description about the main topics that were discussed during the version of this year 2014 of IGSM.

First things first, I tend to thank F2Geos, our sponsor for this event. I wish, in the name of my colleagues, to express our gratitude to F2Geos who, through its generosity, have helped to make our participation to this event possible.

This is my first participation to IGSM and all what can I say, is that the host university – Istanbul Technical University- did a remarkable organizational work. These students who were in the middle of examination period or diploma thesis knew how to manage their time but also the whole event. I would like to thank them for all their efforts and hospitality in the name of my colleagues from Stuttgart University.



Figure 1: Group-Photo of students from Stuttgart University

MESSAGE FROM THE VICE SECRETARY

IGSM is being held at Istanbul, Turkey, under the patronage of Geodesy and Photogrammetry Student Club of İstanbul Technical University for a second time.

We are proud and excited to give life to this meeting and we tried our best to provide a unique meeting content and experience to all.

Organisation committee have worked so hard to make this meeting happen in Istanbul, which is Europe's most populous city.

Istanbul is a magnificent city situated in two continents, with it's Bosphorus, Golden Horn and lots of historical places. We try to make you see the beauty of this city in this meeting.

We were able to organise this meeting with a support from our professors, old organisers, our sponsors and our friends.

We would like to thank everyone who is participating to IGSM 2014.

We all hope that everyone will have a good time and willing to come back in Istanbul once again.

Have a nice week.

Ferah Pırlanta Köksal

IGSO Vice Secretary

GENERAL INFORMATION

Location

ISTANBUL is Europe's most populous city (the world's 3rd largest city proper and 20th largest urban area) and Turkey's cultural and financial center. The city covers 27 districts of the Istanbul province. It is located on the Bosphorus Strait and encompasses the natural harbor known as the Golden Horn, in the northwest of the country. It extends both on the European (Thrace) and on the Asian (Anatolia) side of the Bosphorus, and is thereby the only metropolis in the world which is situated on two continents.

Accommodation

Participants will be staying at İTÜ İMKB Vadi Yurtları (İMKB Valley Dormitories) in İTÜ Ayazağa Campus. It is 15 minutes walk from İTÜ Ayazağa Subway Station.

Brief history about igso

IGSO is an International Geodetic Student Organization and its aim is to unite geodesy students from all over the world.

International Geodetic Student Organization (IGSO), is a non-profit organization which aims to provide worldwide perspective and global synergy among the students in the fields of Land Surveying, Geodesy, Photogrammetry and other relevant studies. This year, the distinguished event of the organization; the annual International Geodetic Students Meeting (IGSM) will be held in Istanbul in June, Turkey by the volunteer students under the patronage of Geodesy and Photogrammetry Student Club of İstanbul Technical University.

Previous and future meetings

| | |
|-------------------------------------|-------------------------------------|
| <i>1988 Delft, the Netherlands</i> | <i>2002 Ljubljana, Slovenia</i> |
| <i>1989 Bonn, Germany</i> | <i>2003 Dresden, Germany</i> |
| <i>1990 Budapest, Hungary</i> | <i>2004 Espoo, Finland</i> |
| <i>1991 Graz, Austria</i> | <i>2005 Istanbul, Turkey</i> |
| <i>1992 London, United Kingdom</i> | <i>2006 Cracow, Poland</i> |
| <i>1993 Prague, Czech Republic</i> | <i>2007 Sofia, Bulgaria</i> |
| <i>1994 Bochum-Essen, Germany</i> | <i>2008 Valencia, Spain</i> |
| <i>1995 Warsaw, Poland</i> | <i>2009 Zurich, Switzerland</i> |
| <i>1996 Hannover, Germany</i> | <i>2010 Zagreb, Croatia</i> |
| <i>1997 Delft, the Netherlands</i> | <i>2011 Newcastle-Upon-Tyne, UK</i> |
| <i>1998 Madrid, Spain</i> | <i>2012 Jaén, Spain</i> |
| <i>1999 Valencia, Spain</i> | <i>2013 Wroclaw, Poland</i> |
| <i>2000 Le Mans/Paris, France</i> | <i>2014 Istanbul, Turkey</i> |
| <i>2001 Newcastle-Upon-Tyne, UK</i> | <i>2015 Espoo, Finland</i> |

Presentations Abstracts

Lectures

Space Technology Activities In Turkey

Presented by: Prof. Dr. Ayşe Filiz Sunar – İstanbul Technical University

Since space technologies, which have become an important tool for protecting and improving the countries, Turkey sees space as a matter of strategic importance and national pride, and space technology is identified as a priority area for Turkey. Hence, Turkey attaches great importance to the use of space technologies not only in the area of satellite communication, but also in the area of capacity building in satellite technologies. In the presentation, recent space technology activities in Turkey and also its importance for environmental issues will be outlined.



Geodetic Measurements For Geodynamic Studies In Turkey

Presented by: Prof. Dr. Haluk Özener – Boğaziçi University

Determining direction and velocity of tectonic movement in a region, microblock rotations, locations of active faults, slip rates of active faults and slip rates components, shear deformation, magnitudes of earthquake potentials, and pre/co/post-seismic velocity fields can be counted as the main outputs of geodetic methods in tectonics and earthquake-induced deformation. Earthquakes occurred in the last twenty years in Turkey (October 1, 1995 Dinar; August 17, 1999 Izmit; November 12, 1999 Duzce; February 3, 2001 Cay and October 23 2011 Van) have been investigated by geodetic methods, and the results have contributed in many ways to other disciplines. The majority of crustal deformation studies are based on campaign mode GPS survey in the country. However, in the recent years, MAGNET in Marmara region (Marmara Continuous GPS Network) and TUSAGA in western Anatolia (Turkish National Permanent GPS Network) with the current TUSAGA-Active (Turkish National GPS RTK Network / a.k.a CORS-TR) covering the entire Turkey have been established to enhance GPS capability by providing high accuracy and integrity. In this presentation, geodetic infrastructure and geodetic studies for geodynamic research in Turkey is described and discussed.

Spatial Thinking

Presented by: Prof. Dr. Rahmi Nurhan Çelik – İstanbul Technical University

‘Spatial Thinking’ ability of people improve very fast every new day; especially among young generations. In this presentation “How Geomatic Engineering students and professionals should approach such acts as the designer, producer and provider of spatial data and information” will be discussed.



Figure 2: Prof. Dr. Rahmi Nurhan Çelik

Participants' Presentations

Using National Open Data Sets for 3D Environmental Analysis

Presented by: Anssi Krooks

An increasing trend in many countries is that the national geographic data sets are offered for free use with open license. In Finland the free data includes for example the national airborne laser scanning (ALS) data as well as photogrammetric imagery and the national topographic database. In this study we present a concept where point clouds derived from the open ALS data and photogrammetric frame images are used with the open topographic data for 3D environmental analysis. The concept is demonstrated in three applications: analysis for open pit mining, flood risk mapping and 3D city model visualization.

The Renewal Of Finnref And The Free Of Charge Positioning Services In Finland

Presented by: Tuukka Mattila

The Finnish Geodetic Institute (FGI) maintains the Finnish permanent GNSS network (FinnRef), which is used as an accessing point to international reference systems and geodynamic studies. FinnRef has been renewed during 2012-2013, and it consists of 19 GNSS reference stations which are compatible with all available systems. The Ministry of Agriculture and Forestry ordered to be developed a public navigation service of 0.5 meter accuracy. FinnRef network offers free of charge positioning services (DGNSS service, Network RTK service and RINEX data) which will be opened in stages during 2014. The positioning services offer new possibilities in the field of positioning.

As-Built Survey Of The Building Facade Using Close Range Photogrammetry

Presented by: Miloš Pandžić

Close range photogrammetry has a great potential and applicability in architecture and civil engineering. It is especially useful when one needs to measure a large number of points without direct contact with object. The goal of the thesis was to assess the accuracy of the as-built survey of building facade carried out by using close range photogrammetry, so that discrepancies of as-built geometry from the designed geometry can be determined reliably. A typical building was surveyed using available equipment for close range photogrammetry at the faculty. Imagery and measurements were processed by using appropriate software tools and results were analyzed in terms of accuracy. The emphasis was also on selecting proper software tools for the analysis of as-built object geometry and accuracy assessment.

Motion Estimation And Classification Of Taku Glacier Using Terrasar-X Satellite Imageries.

Presented by: Abhishek Manandhar

Glaciers are early indicator of climate variation and are important to be monitored. There are several ground- and space-based mechanism for glacial studies, but latter is preferred more for its advantage, over ground-based, in spatial and temporal coverage and efficiency. It is proven that optical satellite imageries are good resources for deriving abundance of information regarding glaciers however its dependence over the weather, cloud cover and snow cover often result in data holes and low accurate estimation of the parameters. This opens significant research opportunities in use of Synthetic Aperture Radar (SAR) imageries for research of Glaciers. In the presentation, the successful attempts on motion estimation and classification of Taku Glacier, Juneau Icefield, Alaska using TerraSAR-X imageries are described. The attempts has been made to estimate the motion of the glacier with different offset tracking methods and its optimization using the images of ascending and descending track and their fusion and using morphological attribute filters. Classification of Glaciers has been made with appropriate selection of features; surface velocity of glacier, coherence map and texture information.

Testing The Suitability Of Spatial Printing Technology For Engineering Applications

Presented by: Krzysztof Chmielnicki and Michał Piwoda

The final result of the designing work is the visualization of the project in form of a drawing or a picture on the screen. Such screen images have many advantages, there are, however, some flaws of this method (of visualization), which makes it necessary to build physical models of the projected objects. Observation of physical models requires no hardware, the observed model is seen using the principles of everyday experience of the observer - as a realistic three-dimensional object and - it can be observed in real time from any site. Moreover, one can directly determine the spatial relationship between its component parts. The aim of this study was to use the 3D printing technology to visualize measured objects. In conclusion we list the temporary 3D printing flaws, advantages and possible applications.

Regional Geodetic Student Meeting (RGSM), Novi Sad (Serbia), 2013

Presented by: Nemanja Stojilković, Marko Šimšić and Jovana Radović

RGSM represents annual students gathering from region countries: Serbia, Croatia, Slovenia, Bosnia and Herzegovina and FYROM Macedonia. It has begun like an idea during the IGSM in Zurich and become a reality during next IGSM meeting, held in Zagreb in 2010. The group of students from Serbia, Croatia and Slovenia who took a part in IGSM, same year, organized first RGSM in Belgrade. Next year, it was organized in Ljubljana and then, in 2012. in Zagreb. Last year, our faculty and city became host of RGSM. Meeting was organized from 8th to 11th November 2013., and we were very pleased to present achievements in different field of geodesy and geoinformatics through different lectures and workshops. Also, students-participants had a chance to show their ideas in same field. This work presents a short photo and video review of some of most important moments during this meeting.

The Usage Of Terrestrial Laser Scanning Technique In The Inventory Of Palace Of Pena

Presented by: Paweł Drwal

The subject of this speech is presentation of surveying works conducted during BARI 2013 Expedition in the Palace of Pena in Sintra, in Portugal. Foreign Student Camps under the name of BARI were organized by students of AGH University of Science and Technology in the seventies and the eighties and in 2001. The aim of every expedition was to measure the high class monuments from UNESCO World Heritage List. Field works consisted of establishment of surveying control network, Total Station measurement of surveying marks and terrestrial laser scanning measurements. The aim of performed actions was to conduct architectural inventory of the palace and to draw complete and up to date architectural documentation of this particular object.

Detection Of Agricultural Land Abandonment

Presented by: Barbara Czesak

Agricultural land abandonment is becoming a common phenomenon in Poland. Abandoned agricultural land is valuable space that could enhance Polish economy. Using airborne laser scanning and land surveying techniques to detect abandoned agricultural land has not yet been applied for Polish countryside. As it is a dynamic phenomenon it is connected to various difficulties, which need to be solved. Detection of agricultural land abandonment is required to fully understand the consequences of land abandonment and to enable effective and sustainable use.

How To Build A Galileo Satellite

Presented by: Holger Wilken

Using signals from global navigation satellite systems like GPS or GLONASS has become commonplace for both geodesists and Joe Public. The upcoming European Galileo system will be the next GNSS. Instead of looking at the end user, I would like to present the other side of the transmission line: Where do the signals come from? What does it take to build a Galileo satellite? My job at OHB System, the company that builds 22 of the Galileo satellites, allows to have a look behind the scenes. From an overview of the satellite's components via the integration and test campaigns up to the launch into space.



Figure 3: Holger Wilken

Augmented Reality - A New Geovizualisation Tehnology For GIS

Presented by: Dejan Popovic, Marko Simsic and Nemanja Stojilkovic

This work is combination of reality and virtuality, and thus we are going to introduce you a technology which helps us to see, hear, touch things more than we can feel in reality. Such a technology provides already calculated, modelled objects within real world, and thus is our support in everyday activity. This presentation will be based on implementing AR technology in GIS, which includes using an application and a combination of LBS, markers, maps, camera,... etc. Therefore, we will show you virtual augmentations in real world.

Application Of The Extreme Value Analysis To Model Flooding Events

Presented by: Cristina Caballero

Floods and coastal erosion in the United Kingdom (UK) are hazards that are commonly thought likely to increase due to the impacts of climate change and the results of development in areas at risk. It is generally considered that it is not possible to prevent all types of flooding, but there are strategies that can be taken to manage these risks and reduce the impacts these hazards on the built environment and particularly critical civil infrastructures. Methods for assessing risk can include in situ examinations, historical flood records, Geographic Information System (GIS), catastrophe modelling and extreme value analysis (EVA). EVA statistics are used to study observed rare events and predict future behaviour. This research is using EVA to better understand the flooding impacts on critical coastal infrastructure in the UK via the multivariate approach and data from fourteen tide gauges along the East Coast of the UK from Lerwick to Dover. The project will develop objective, reproducible and valid methods that will be used in i) other areas ii) for climate change scenarios and iii) to consider flooding in time as well as space. I thank my collaborators at HR Wallingford and my supervisors Drs Lee Boshier and John Hillier.

Automatic Detection Of Blurred Images

Presented by: Till Sieberth

Unmanned Aerial Vehicles (UAV) have become an interesting and active research topic for photogrammetry and other sciences. Current research is based on images acquired by UAVs, which have a high ground resolution and good spectral resolution, due to low flight altitudes combined with a high resolution camera. One of the main problems of data processing is blur caused by camera movement during image acquisition. The detection and removal of these images is currently achieved manually. However, the influence of blur needs to be analysed to detect if blur decreases the quality of automatically processed data. An automated filtering procedure is necessary to remove blurred images. Additionally approaches for deblurring using image overlap are developed. This presentation analyses the influence of blurred images on automatic image processing and identifies and describes the advantages of an automatic filtering process.

The Aquisition Of Hyperspectral Imagery Under Laboratory Conditions

Presented by: Aleksandra Tomaszewska, Damian Pacholec

Hyperspectral imagery allows to acquire images in even to hundreds of narrow bands. Thanks to that we can undertake a thorough analysis of prospected objects. In our paper we used Headwall's hyperspectral cameras, which acquire images based on the principle of pushbroom scanner in VNIR and NIR spectral ranges. It requires of using special slider, what leads to need of assigning parameters of exposure in order to obtain square pixel as a determinant of images cartometry. Depending on demand, there is also the possibility of installing these cameras in the plane or drone, so it is important to assign parameters different for each ceiling.

Participants' Posters

Application Of Terrestrial Laser Scanning To The Assessment Of A Dam Construction

Presented by: Maria Zygmunt

The character of structures for water impoundment entails the necessity that these structures should be particularly well inspected and the data obtained in the process of control measurement and observation should be used to prepare the safety assessment of the structure. Measurement techniques used for the inspection of water impoundment structures should be improved along with experience gained in this area. The poster depicts the assessment of the possibilities for improving the currently used inspection methods through the use of the terrestrial laser scanning (TLS) technology.

Testing The Metrology Accuracy Of Terrestrial Laser Scanning Method In Laboratory Conditions

Presented by: Pelagia Bilka and Tomasz Noszczyk

For monitoring of large engineering objects (common strategic and inaccessible one) terrestrial laser scanning (TLS - Terrestrial Laser Scanning) can be a good technological solution. Monitoring of such objects, however, requires good data quality, manifested sufficient accuracy and stability. In order to verify the quality of data obtained using TLS, the author made a series of tests to check the accuracy of metrological equipment. The results allow us to conclude that a carefully planned measurement of terrestrial laser scanning technology provides high-quality data.

Geodetic-Legal Aspects Of Rivers Measurements In National Parks

Presented by: Robert Gradka

Poster is a partial results of the tacheometric measurement passage of the river flowing through the National Park in Poland. The coastline of the river, which is the subject of measurement, is highly variable over its entire length, in the absence of any interference in the protected areas and the inability to regulate these watercourses. The coastline does not coincide with the borders of the evidence of the river. The specificity of field work in national parks, in mountainous areas, requires the surveyor's knowledge of not only the law of geodetic, but also knowledge of the constraints of national parks. Methodology work is the use of different measurement techniques and the integration of received data. Terrain necessitates the use of information technology and surveying equipment. The end result is a graphic design longitudinal profiles of the river in sections over 3 km and execution of cross profiles. In addition, the author presents a photographic documentation showing the shoreline of rivers and streams them at intervals of about 40 meters. In this poster relates to the development of the river Prądnik flowing through the Ojcowski National Park.

Integration Of Lidar And UAV Technologies And Applications

Presented by: Nikola Jankovic, Marina Davidovic and Jovana Radovic

The mobile laser scanner gives the user the ability to capture point cloud information from a moving platform with a level of precision that will compliment existing survey techniques. Mobile laser scanners can capture highly detailed and accurate data to support rehabilitation projects as well as the design and layout of new roads. They are best combined with unmanned aerial vehicles which can be used to obtain highly detailed raster data, which can be used as a base for projects. The efficiency and accuracy is improved with the use of GPS and INS sensors, which gives a fully integrated system of measurement and mapping.

The Comparision Of Polish And Spanish Cadastre System In Aspect Of Integrated Cadastre System

Presented by: Katarzyna Brzezińska and Izabela Kaczmarek

Integrated Cadastral System as interoperable public register has to satisfy the requirements of unity, interchangeability and conformity. From a few years in Poland are conducted works related to the establishment and introduction of the real estate cadastre. Changes in Polish legislation, which took place in the past two decades, and our entry into the European Union made it possible to undertake such a huge task of creating a modern cadastre. In our work, we present the differences between the cadastre in Spain and Land and Buildings Register in Poland and we will indicate the direction in which changes should follow in Poland.

Photogrammetry And Laser Scanning In Performance Of Engineering Studies

Presented by: Agnieszka Brachucy, Krzysztof Chmielnicki, Paweł Drwal, Paulina Grabek, Agnieszka Orzech, Michał Piwoda and Katarzyna Pogorzelec

Photogrammetry and laser scanning are two of the many measurement technologies used in modern surveying. Photogrammetry is a branch of science that provides spatial information from images. In the era of today's software, skillfully captured photogrammetric images can give very detailed and comprehensive information about the object of measurement. Laser scanning gives equally broad capabilities, though with slightly different features and benefits. The combination of these two measurement techniques provides an opportunity to perform studies which complement each other, with a broad range of use in fields that are not associated with conventional surveying. Wide scope of application of the above-mentioned measurement techniques are presented on the basis of projects performed by students of the Geodetic Student Association Dahlta, AGH Kraków.

Geodesist Rally

Presented by: Joanna Górską, Anna Duda and Marzena Kruszakin

The Geodesist Rally was held during 23-25th May this year. Each year third-year students of Geodesy and Cartography of the Wrocław University of Environmental and Life Sciences, along with the Students' Scientific Association and „Zenit-Nadir” association are organizing 3-day meeting for the geodesy students and people from geodesy business. This poster contains information about the attractions and activities for the 34th Gedesist Rally, which took place in polish mountain range – Sudety (Sudetes). This Rally is very important part of the life of the geodesy circles and tradition of our university. Every year over 400 people participate in games like Geo-Olympics or trekking through the moutains and the number of participants is still growing. The poster shows the best moments of the rally through the years (for example Geo-Olympics and mountains trip).

Exploration Of Bear Cave In Kletno

Presented by: Joanna Tryhut

This poster will be about exploration of the Bear Cave in Kletno made by University of Environmental and Life Sciences in Wrocław. Every two years during scientific camps our students are making geodetic measurements of the interior of the cave to research its deformation. Our poster will show especially results of their work, but also will tell you a little about history and beauty of the Bear Cave.

Analysis Of The Optimum Location Of The Wind Farm In The District Of Lower Silesia With Using Arcgis Tools

Presented by: Anna Wojciechowska


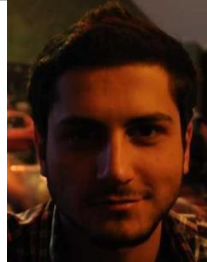





This poster will be about analysis of the optimum, best location of the wind farm in the district of Lower Silesia with using ArcGIS tools. It will contain basic information about GIS, description of ArcGIS tools and technical conditions of wind farms needed to choose the best location of it. It will be also about pros and cons of alternative energy sources and utility of ArcGIS Tools for example Spatial Analyst Tools, 3D Analyst Tools, Conversion Tools or Raster Surface. There will be presented final result of analysis on maps, graphs and tables.

Development Of A Numerical Model Of The Behavior Of The Concrete Dam And Verification On The Basis Of Surveying The Periodic Measurements Including The Period Of Seasonal Floods

Presented by: Michał Rabiński, Marlena Galarek, Karolina Kamińska

The main objective of the project was to develop a geometric model for the creation of a numerical model of behavior of concrete in the dam on the Dunajec Roznow. The full model was developed by the Scientific Water Engineering, Faculty of Environmental Engineering, Technical University of Warsaw. Determination of vertical displacements on the basis of precise leveling was another element of the periodic tests, because the need for periodic measurements are necessary during operation. An important aspect of the project was to assess the possibility of using terrestrial laser scanner to verify the geometry of the numerical model the behavior of concrete dam and periodic inventories signaled concrete dam construction points on the basis of measurements. The resulting numerical model of the object is the basis for determining the deformation and changes in the barrier in the process of forecasting its behavior based on the results of numerical modeling of finite element method (FEM). It is an innovative approach to the subject matter of determining displacement hydraulic engineering facilities, but analysis of the results confirms the usefulness of using this method. The innovative part of the project was the implementation of the above-water measurements inventory of the premises in laser scanning technology.

Organization Team

| | | | |
|--|---|---|--|
| Ferah Pırlanta Köksal IGSO Vice Secretary |  | İlker Demirci IGSO General Secretary |  |
| Sevda Olgun IGSO Treasurer |  | Güven Can Güç HR Coordinator |  |
| Naz Altay HR Coordinator |  | Çağıl Pozam Social Events Coordinator |  |
| Onur Karaca Sponsorship Coordinator |  | Kaner Levent IGSM Coordinator | |
| Committee Members | | | |
| Burak Başoğlu Zeynep Erman Fırat Koç Rojda Ekinci Reva Can Mahmood Ahmet Sönmez | | Can Delice Ayşe Türkmen Mehmet Kaya Okan Hamdi Göktuğ Gizem Karadal Mehmet Erçin | |

Participants list

Bellow figures a photo of the whole group which participated this year to IGSM'2014.



Figure 4: Photo-Group of all the participants in the IGSM2014

Statistics about the participation in this version of IGSM event are presented bellow.

| Country | Number of Students |
|----------------|--------------------|
| Austria | 9 |
| Croatia | 6 |
| Czech Republic | 2 |
| Fnland | 11 |
| Germany | 29 |
| Poland | 35 |
| Serbia | 20 |
| Spain | 2 |
| United Kingdom | 2 |
| Turkey | 9 |
| Total | 125 |

Table 1: Number of students per country

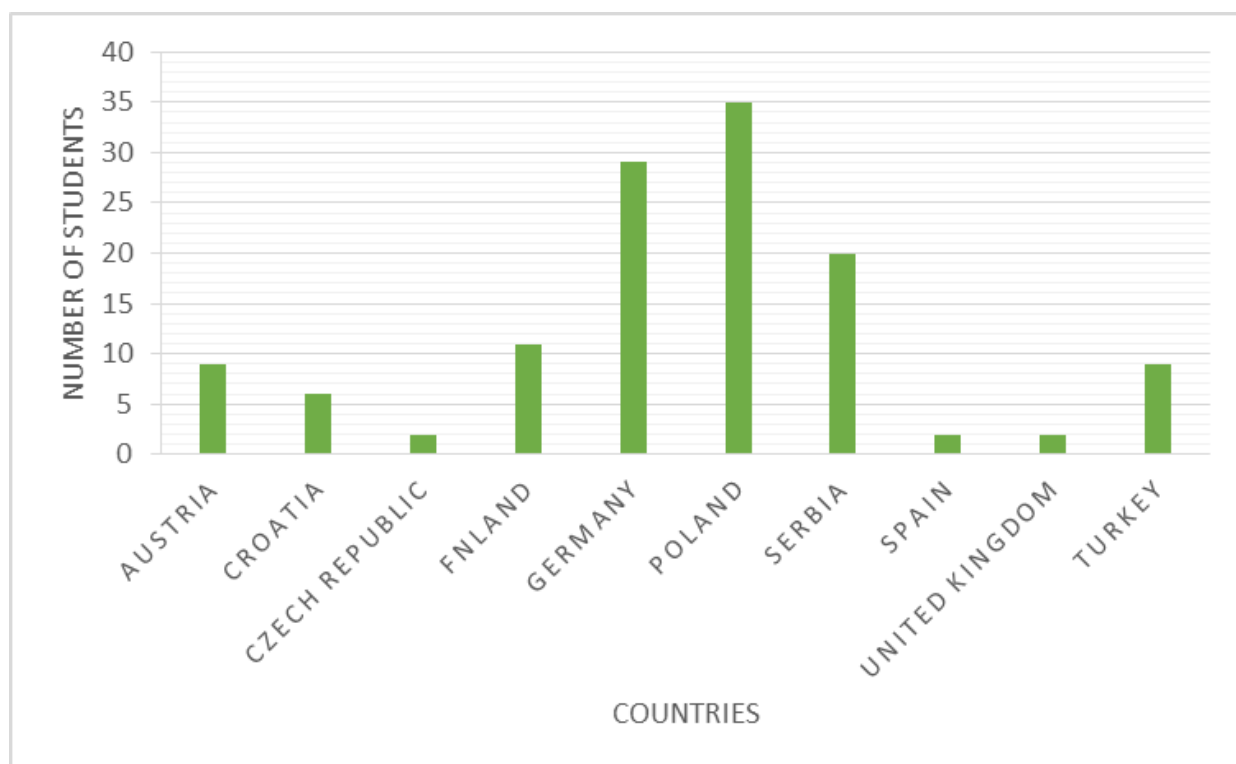


Figure 5: Number of students per country

| Country | Number of Seniors |
|----------------|-------------------|
| Afganistan | 2 |
| Austria | 2 |
| Czech Republic | 1 |
| Finland | 4 |
| Germany | 10 |
| Poland | 2 |
| Spain | 1 |
| Switzeland | 3 |
| Total | 25 |

Table 2: Number of seniors per country

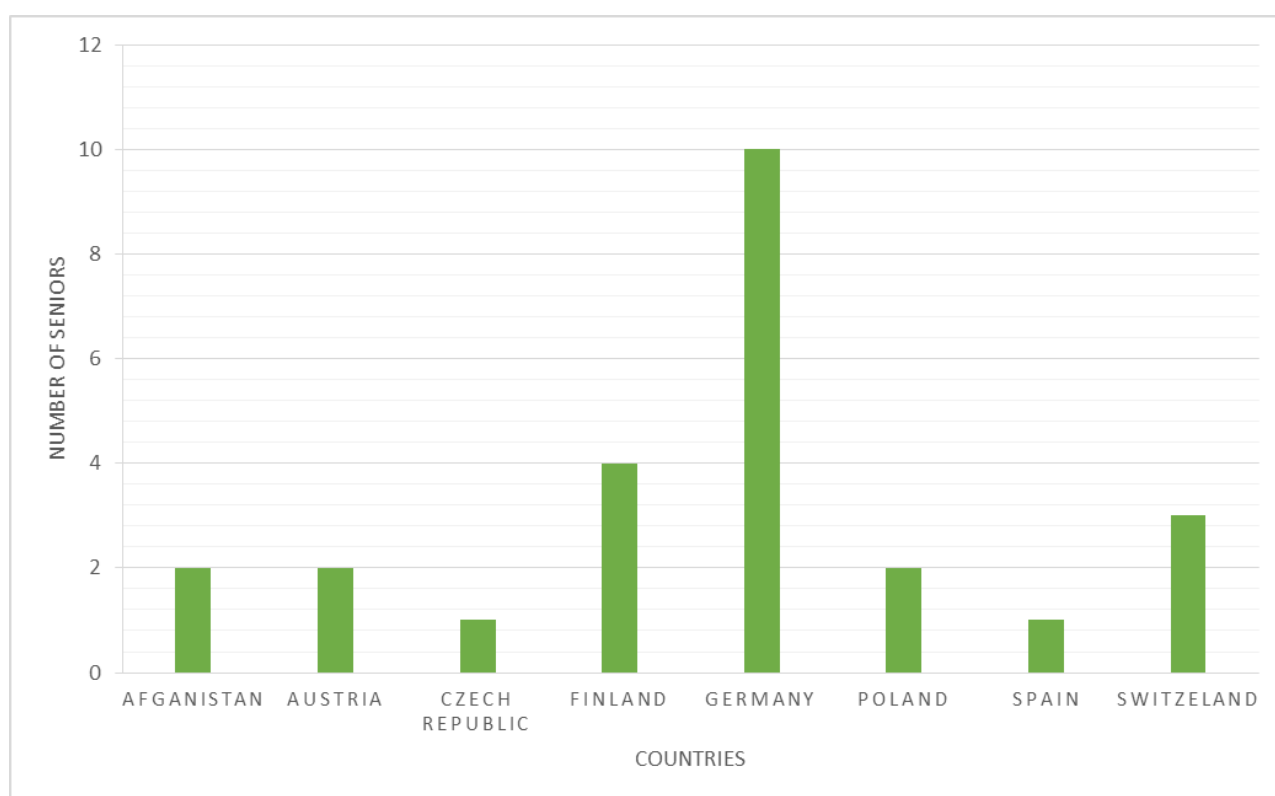


Figure 6 Number of seniors per country

| Country | Number of Participants |
|----------------|------------------------|
| Afganistan | 2 |
| Austria | 11 |
| Croatia | 6 |
| Czech Republic | 3 |
| Fnland | 15 |
| Germany | 39 |
| Poland | 37 |
| Serbia | 20 |
| Spain | 3 |
| Switzeland | 3 |
| Turkey | 9 |
| United Kingdom | 2 |
| Total | 150 |

Table 3: Number of participants per country

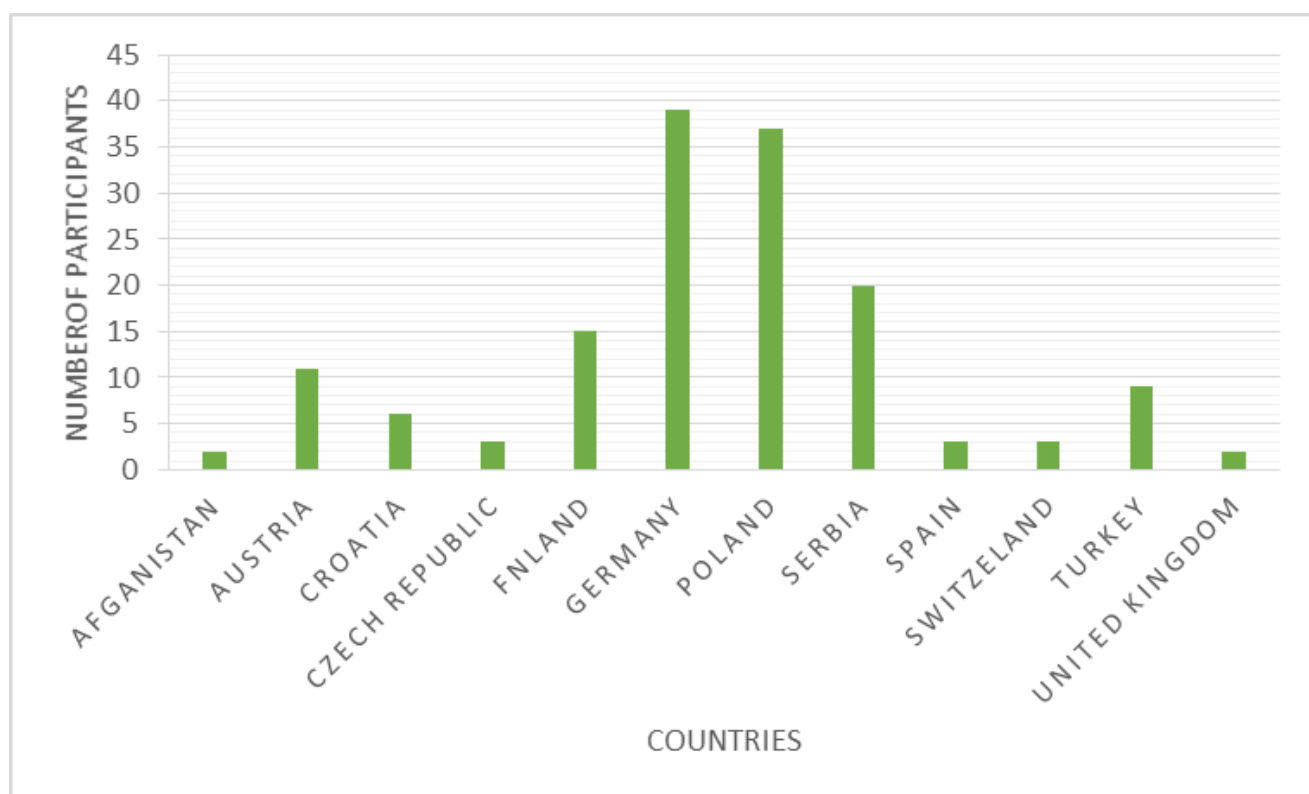


Figure 7: Number of participants per country

| Country | Number of Universities |
|----------------|------------------------|
| Afganistan | 1 |
| Austria | 1 |
| Croatia | 1 |
| Czech Republic | 1 |
| Fnlnd | 1 |
| Germany | 5 |
| Poland | 5 |
| Serbia | 2 |
| Spain | 2 |
| Switzeland | 1 |
| Turkey | 3 |
| United Kingdom | 1 |
| Total | 24 |

Table 4: Number of universities per country

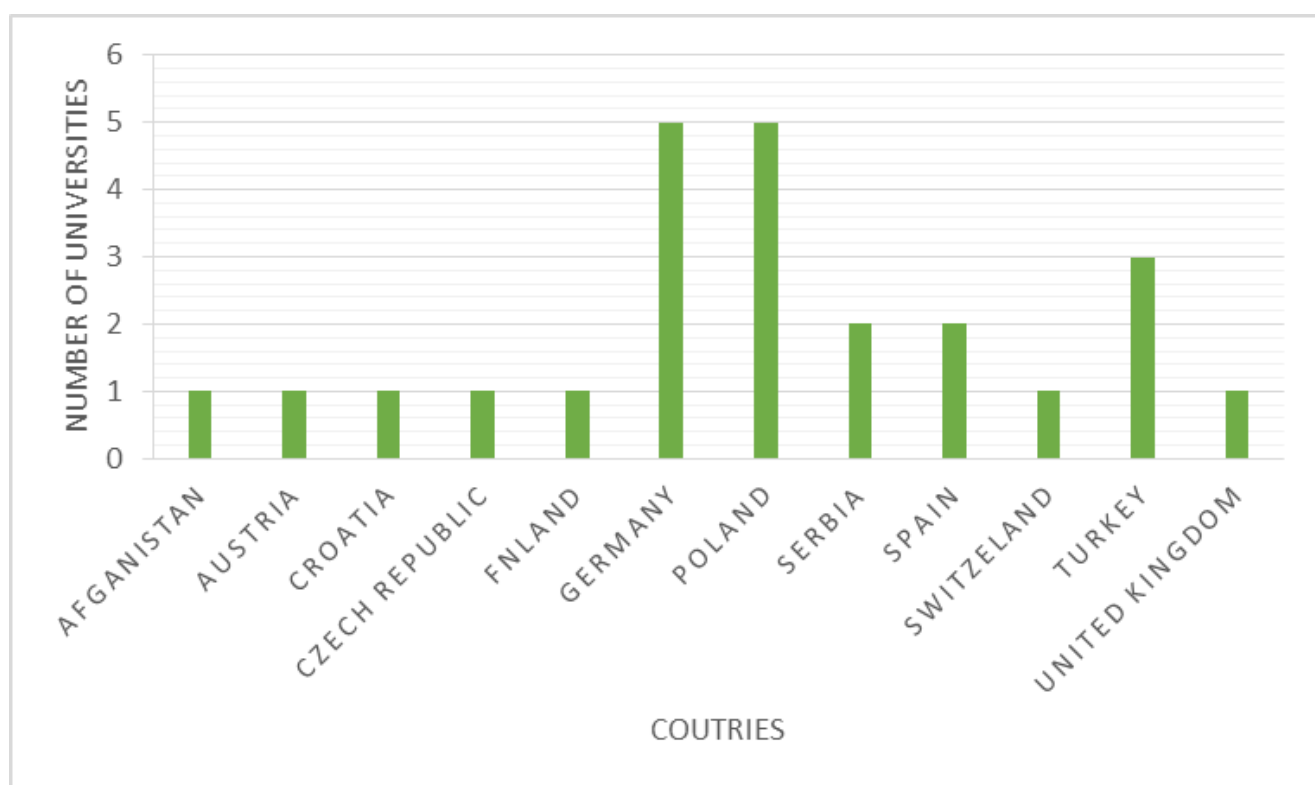


Figure 8: Number of universities per country

Students

| Country | University | Participants Names | |
|----------------|--------------------------------------|--|--|
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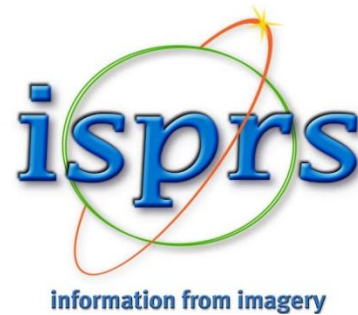


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