CONFERENCE PROGRAM

April 13 - 15, 2023
Marseille, France

ICGDA 2023

2023 6th International Conference on Geoinformatics and Data Analysis

ICoSSE 2023

2023 International Conference on Software and System Engineering

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WELCOME MESSAGE

Dear Distinguished Guests, Ladies and Gentlemen,

Welcome to attend the 2023 6th International Conference on Geoinformatics and Data Analysis (ICGDA 2023) and the 2023 International Conference on Software and System Engineering (ICoSSE 2023), which will be held hybrid (on-site and online) in Marseille, France during April 13 to 15, 2023.

The Conference aims to gather researchers, scholars, and industry professionals all over the world for the presentation and exchange of past experiences, research results and new advances in the field of Geoinformatics and Data Analysis and Computer Science, System, System Model, and Software Engineering Science. Contributions that promote scientific contacts and exchanges of ideas between people all over the world are welcome.

We want to express our sincere gratitude to the Conference Committee members, whose work in encouraging participation made the Conference possible and to all the authors who submitted their papers.

Special thanks go to the keynote speakers, who accepted to contribute to the Conference by sharing their expertise: Prof. Robert Laurini, INSA Lyon, University of Lyon, France; Prof. Jean Sequeira, CEO of the 2IK Company, Aix-Marseille University, France.

This year, there will be 2 keynote speeches and 3 sessions on Software and Information System Development and Service and Application Software Design and Testing.

Wishing all of you an unforgettable and perfect experience at the conference, we hope that you all find your participation fruitful and rewarding and that you may get from its new inputs for your researches and the possibility of establishing future collaborations.

We look forward to meeting you again on the occasion of ICGDA\ICoSSE 2024.

Yours sincerely,
Conference Organizing Committee

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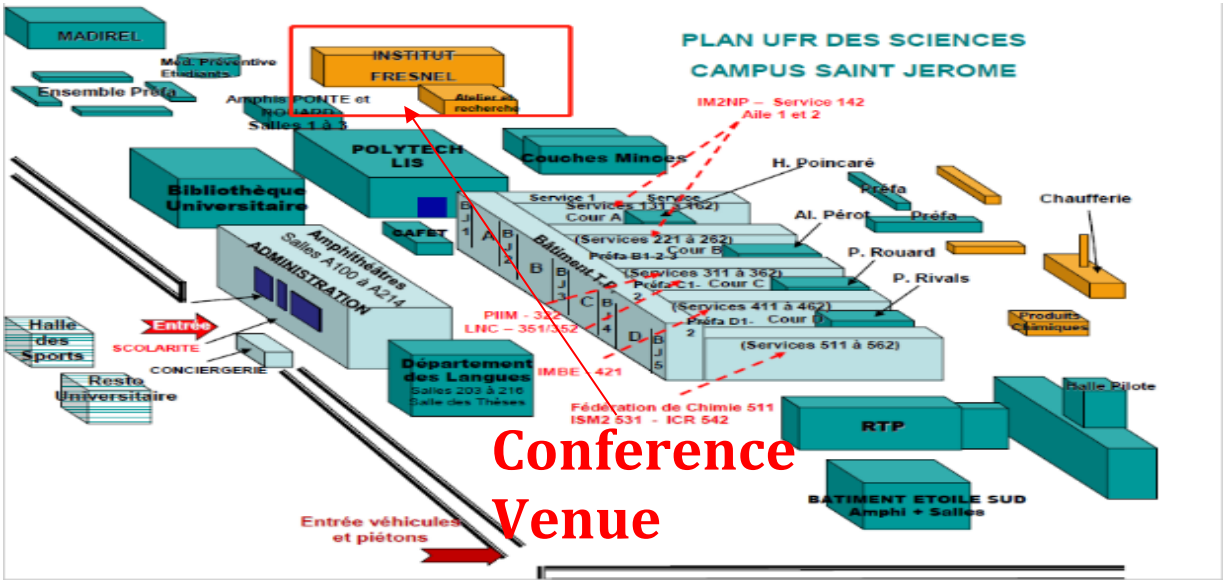
CONFERENCE GUIDELINE

FOR ONSITE PRESENTATION

Conference Venue

- Room: Pierre COTTON
- Address: Institut Fresnel, Campus Universitaire de Saint-Jérôme, 52 Av. Escadrille Normandie Niemen, 13013 Marseille, France



Presentation

- The duration of a presentation slot is 20 minutes. Please target your lecture for a duration of about 15 minutes for the presentation plus about 5 minutes for questions from the audience.
- Your punctual arrival and active involvement in each session will be highly appreciated.
- Get your presentation PPT or PDF files prepared and backed up. You can use USB flash drive (memory stick), make sure you scanned viruses in your own computer. Each speaker is required to meet her / his session chair in the corresponding session rooms 10 minutes before the session starts and copy the slide file (PPT or PDF) to the computer.
- It is suggested that you email a copy of your presentation to your personal inbox as a backup. If for some reason the files can't be accessed from your flash drive, you will be able to download them to the computer from your email.
- Laptops, projector & screen, laser sticks will be provided by the conference organizer.

Name Badge

- For security purposes, delegates, speakers and staff are required to wear their name badge to all sessions and social functions. Entrance into sessions is restricted to registered delegates only. If you misplace your name badge, please replace at the registration counter.

Notes and Tips

- Your paper ID will be required for the registration.
- One best oral presentation will be selected from each oral session. The Certificate for the best one will be awarded at the end of each session.
- After the session, there will be a group photo for all presenters in this session.
- Please kindly make your own arrangements for accommodations

Security

- Please ensure that you take your belongings with you at all times when leaving a room. Do not leave bags or laptops unattended. Please note that the ICGDA&ICoSSE 2023 and the onsite staff will not accept liability for any kind of damage, losses or injuries occurring to persons or personal belongings during the conference.

CONFERENCE GUIDELINE

FOR ONLINE PRESENTATION

Presentation

- The duration of a presentation slot is 20 minutes. Please target your lecture for a duration of about 15 minutes for the presentation plus about 5 minutes for questions from the audience.

Platform

- ZOOM Meeting | 线上会议平台: ZOOM
- For Users from mainland China please download: https://zoom.com.cn/download
- For Other Users please download: https://zoom.us/download

Sign-in & Join

STEP 1	Install the ZOOM
STEP 2	Join the meeting using Meeting ID or through the link provided
STEP 3	After entering the meeting, connect to PC Audio and make sure you can hear and be heard
STEP 4	Get familiar with the following: mute/unmute, rename, chat, raise hands, and screen share, etc

Time Zone

1. Central European Summer Time (CEST), UTC/GMT+2
2. Please make sure that the clock and the time zone on your computer are set to the correct France Time

Environment

1. Quiet Environment & Proper lighting
2. Stable Internet Connection

Voice Control

1. Please keep muted when you are listening to the talks.
2. Speakers can unmute microphone when it is his or her turn for presentation

Device

- A computer with an internet connection (wired connection recommended)
- USB plug-in headset with a microphone (recommended for optimal audio quality)
- Webcam (optional): built-in or USB plug-in

Conference Recording

The whole conference will be recorded. We appreciate your proper behavior and appearance.
The recording will be used for the conference reports among the committee, which won't be distributed to or shared with anyone else, and it shall not be used for commercial or illegal purpose. It will only be recorded by the staff; the presenters are not allowed to record.

Naming Manner

Role	Format	Example
Keynote Speaker:	Keynote-Name	Keynote-Prof. Abby
Session Chair	Session Number-SC-Name	S1-SC-Prof. Adam
Author	Session Number-Paper ID-Name	S1-CD1001-Alex
Listener	Listener-Name	Listener-Aron

Online Room

ROOM	MEETING ID	MEETING LINK
	817 5811 4894	https://us02web.zoom.us/j/81758114894

Online Testing

Thursday, April 13	Room ID: 81758114894 Link: https://us02web.zoom.us/j/81758114894
10:00-11:00 **(GMT+2)**	AP2013, AP0004, AP0016, AP2003, AP2005

Online Only

Activity	Meeting ID	Link
Session 3	81758114894	https://us02web.zoom.us/j/81758114894

AGENDA OVERVIEW

Note: All following time is in UTC/GMT + 2

April 13, 2022 | Thursday

Time	Activity	Venue
10:00-11:00	Online Test: AP2013, AP0004, AP0016, AP2003, AP2005	Room ID: 81758114894 https://us02web.zoom.us/j/81758114894

April 14, 2023 | Friday

Time		Activity	Venue	Online
Note: All following time is in UTC/GMT+2				
10:30-11:00		Conference Sign-In	Meeting Room: Pierre COTTON	
Keynote Speech Host: Conference Chair: Prof. Salah Bourennane, Ecole Centrale Marseille, France				
11:00-11:10	Opening Remarks	Conference Chair: **Prof. Salah Bourennane** Ecole Centrale Marseille, France	Meeting Room: Pierre COTTON	Room ID: 817 5811 4894
11:10-12:00	Keynote Speech I	**Prof. Robert Laurini** KSI Fellow and Professor Emeritus INSA Lyon, University of Lyon, France		
Speech: A Research Agenda on Knowledge Management for Regional Policies				
12:00-14:00		Lunch for In-person Attendees		
14:00-15:20	Technical Session	**Session 1: Software and Information System Development I** AP2007-A, AP2002, AP0014, AP0018-A	Meeting Room: Pierre COTTON	Room ID: 817 5811 4894
15:20-15:40		Coffee Break		
15:40-16:30	Keynote Speech II	**Prof. Jean Sequeira** CEO of the 2IK Company (2IK: Image, Information & Knowledge); Full Professor at the Computer Science Department of the Aix-Marseille University	Meeting Room: Pierre COTTON	Room ID: 817 5811 4894
Speech: Using Semantic Knowledge for Remote Sensing Image Analysis				
16:30-17:30	Technical Session	**Session 2: Software and Information System Development II** AP2009, AP0005, AP0010	Meeting Room: Pierre COTTON	Room ID: 817 5811 4894
17:30-19:30		Dinner for In-person Attendees		

April 15, 2023 | Saturday

Time		Activity	Online
09:00-10:40	Technical Session (Online Only)	**Session 3: Service and Application Software Design and Testing** AP2013, AP0004, AP0016, AP2003, AP2005	Room ID: 817 5811 4894

KEYNOTE SPEAKERS

Keynote Speech

11:10-12:00 (UCT+2), April 14, 2023

Prof. Robert Laurini

(KSI Fellow and Professor Emeritus),
INSA Lyon, University of Lyon, France
President of "Universitaires Sans Frontières/Academics Without Borders"

Prof. Robert Laurini, (aka Roberto) after having been distinguished professor of information technology at INSA/University of Lyon, France, was appointed emeritus professor at KSI, United States. During his career, he has supervised 44 doctoral students and was a member of PhD committees in 17 countries. He worked in the United Kingdom, the United States, Italy, Argentina and Mexico. After carrying out research in geographic information systems for urban and environmental planning, he turned to artificial intelligence and geographic knowledge modelling for smart cities and territorial intelligence. On these subjects, he wrote 8 books and more than 250 articles. In 2009, he founded "Universitaires Sans Frontières/Academics Without Borders", an NGO dedicated to the modernization of universities in which he is in charge of Latin America. He speaks French, English, Italian and Spanish.

Speech Title: A Research Agenda on Knowledge Management for Regional Policies

Abstract

A few months ago, there was an expert brainstorm worshop whose aim was to create a research agenda dedicated to knowledge engineering and management for regional planning and policy making.

After having analysed the Sustainable Development Goals and the possible regional levers, several directions and lines of research have been identified and detailed.

In total, 39 lines of research were proposed, leading to more than 100 doctorate subjects. The first set was to reveal the characteristics of regional knowledge in contrast to conventional business knowledge. The other lines of research range from the modeling of space-time knowledge to fuzzy rules, from gazetteers to ontologies, from scalability to the supersiding of geographic rules, etc

This research agenda addresses also related to border effects, semantic and seamless interoperability of geographic knowledge systems, and the needs for curating of knowledge and elimination of false knowledge have also been identified. Without forgetting the integration of collective intelligence, the use of knowledge (case-based reasoning) can also boost the economy/innovation and technological and sociological watching.

KEYNOTE SPEAKERS

Keynote Speech II

15:40-16:30 (GMT+2), April 14, 2023

Prof. Jean Sequeira

CEO of the 2IK Company (2IK: Image, Information & Knowledge);
Professor at the Computer Science Department of the Aix-Marseille University

Prof. Jean Sequeira has been the CEO of 2IK (Image, Information & Knowledge) company since 2017 and an "Invited Professor" since 2008 at the IRSA (Institute for Remote Sensing Applications – institute of the Chinese Academy of Sciences). Formerly, he had been a research project leader at the IBM France company (1981-1991) and a Full Professor at the Aix-Marseille Université from 1991 to 2021 (Exceptional Class Professor since 2010). He used to work in foreign countries (two years in Ivory Coast and six months in United States) or in collaboration with various countries as China, Algeria, Peru, India, Canada. He also developed research partnerships with several industrial companies. In 2006, he participated to the creation of an international organization, ISDE (International Society for Digital Earth) and he had been a member of its Executive Committee for ten years (2006-2016). He is the author of about 135 papers and he supervised about 30 PhD students.

During the last 45 years, Prof. Jean Sequeira has been developing research and projects (with institutes and industrials) in the field of "Image and Computer Science", i.e. "Image Analysis", "Geometrical Modeling", "Visualization and Immersive Interaction", "Pattern Recognition", "Artificial Intelligence", for applications dedicated to "Medical Imaging", "Remote Sensing", "Forensics", "Industrial Computer Vision", "Video Watching" and "Sport Supervision". Since he retired from his position of Professor at the University in 2021, Jean Sequeira has been developing a Research and Development activity on behalf of the 2IK company, through several partnerships with industrials and academics.

Speech Title: Using Semantic Knowledge for Remote Sensing Image Analysis

Abstract

Image Analysis and Geometrical Modeling play an important role in exploiting remote sensing data for various applications (urban planning, wetland quantification, pollution analysis, urban green index, …). But what we want to extract from the data strongly depends on the application and its context. This leads us to ask ourselves the questions: which contextual information do we want to extract? and how do we structure it in the frame of a given application? Asking these questions requires to discuss about the concepts of "contextual information" , "machine learning", and specifically "semantic knowledge".

This discussion will be illustrated by an industrial user case we have worked on in the frame of a partnership with the Airbus Helicopters company. Our goal was to detect and to track helipads, which are platforms for helicopter landing, in order to help the pilot – and even, to provide an automatic landing – using a video camera embedded in the helicopter.

We will especially show how semantic knowledge helps efficiently the process in order to provide a robust real time detection and tracking. And we will spend some time on specific algorithms developed for this application.

Parallel Session 1

Software and Information Systems Development

14:00-15:20 (GMT+2), April 14, 2023 | Friday

Session Chair: Prof. Salah Bourennane, Ecole Centrale Marseille, France

Room ID: 81758114894
Link: https://us02web.zoom.us/j/81758114894
Onsite Meeting Room: Pierre COTTON

Presenter	Information
AP2007-A 14:00-14:20	**Integration of Preference Vectors with Resampling Techniques for Imbalanced Document Classification** Chihli Hung, Chung Yuan Christian University, Taiwan This research proposes a novel method that integrates preference vectors with resampling techniques for the imbalance of multi-class documents. The class imbalance is because the amount of data in the large class is greater than the amount of data in the small class, which causes poor prediction for small classes. In the literature, most studies focus on numerical and binary imbalanced classification problems. The imbalanced multi-class situation in documents is normal in a real life but it is usually ignored by most of the literature on both document classification and class-imbalanced problem fields. The preference vector takes the class as the vector feature, and the weight of the class represents the preference of the word for the class, which adjusts vector quality for imbalanced classification tasks. In terms of quantification, this study proposes a hybrid resampling strategy to increase the amount of data in small classes and reduce the amount of data in large classes. For large-class data, K-Means is used to remove outliers, and for small-class data, the recursive self-organizing map is imbedded into SMOTE (Synthesized Minority Oversampling Technique) to augment the data. In initial experiments, the proposed method shows its potential in multi-class imbalanced document classification tasks.
AP2002 14:20-14:40	**A Case Study to Increase Quality of Industrial Edge Software Product' s Dynamic Data Testing** Zehra Ateş, Siemens Turkey Company, Turkey In recent years, the importance of software testing has increased with the transition from waterfall to agile working methodology. Software testing process increases the quality of software, supplies more secure, verified, and validated software. Especially, testing has great importance on industrial applications that effects human life. There are many types of testing methodologies such as system, integration, smoke, unit, regression testing etc. At the base, all software testing progress starts with manual testing. Testers and test automation developers has a key role on development teams. Projects are completed with the quality approval of the software by testers. Besides of manual testing, test automation has an importance to expose incidents and to decrease human effort. Many different types of test automation frameworks and tools have developed. It is also stage of deployment process of pipelines on some projects. Because of all these reasons, this paper offers a new technique to automate visualized device anomaly values on application' s interface on industrial software products area. Anomaly values are the most important part of devices and testing the anomaly values on graphs doesn't give effective results on manual testing. The results show that the device anomaly score accuracy of the developed automation robot improves the test quality of system.

Room ID: 81758114894 Link: https://us02web.zoom.us/j/81758114894 Onsite Meeting Room: Pierre COTTON	
Presenter	**Information**
AP0014 14:40-15:00	**Toward an efficient geographical routing protocol for internet of vehicles** Abdellah Kaci, University of Rennes, IRISA Lab., INRIA, France The Internet of Vehicles (IoV) is a use case of the Internet of Things (IoT), where the urban vehicle fleet forms a worldwide network. Quality of Service (QoS) optimization in IoV is a challenging task, since vehicles are in continuous movement, which causes the network to be unstable and in continuous topology change, this creates a hostile environment with many variables that should be taken into consideration. Locationbased routing protocols have proven to be the most performing in such an environment, they offer high packet delivery with low delay, but they also encounter some issues such as routing loops and bandwidth overload. In the present paper, we study existing solutions and propose a novel optimal location based routing algorithm named Minimum Hops Routing (MHR). For experimental study, we compared the proposed MHR algorithm with existing solutions from the state of the art. The experimental results show that the proposed MHR solution is more efficient than existing solutions in terms of reliability enhancement and delay.
AP0018-A 15:00-15:20	**Summary on the Study of Beekeeping Potential Data and the Development of a Decision Support System Involving a Web Mapping Platform** Philippe Doyon, Sherbrooke University, Canada Honeybees play a crucial role in pollinating agricultural crops and terrestrial ecosystems. A diversity of pollinator species in an ecosystem increases the pollination efficiency of floral systems tenfold and optimizes the pollination service for increased crop yield [1]. The first objective of this project is to determine the potential for beekeeping in a specific region of Quebec, Canada, given the current environmental conditions, in order to optimize production for beekeepers in the area. The second goal of the project is to provide decision-makers with the tools and information needed to understand and utilize beekeeping data and potentiality analysis, using a decision support system. The role of the decision support system is designed to gather, analyze and present information to aid in informed decision-making. In this project, a decision support system that incorporates a mapping platform is proposed as a tool to present beekeeping data in Quebec. A complete review of data and factors that impact honey production will be conducted. The data are classified according to the following main categories: environmental/climatic, available floral resources, land cover use and derived relationships, chemical stress and topographic landscape forms. The decision support system is designed according to the nature of the data and the access to available technologies. Continuous, real-time data management must be configured to make the data interoperable. Multidimensional data loading tools are configured to display data and analysis in an interactive dashboard. The dashboard features a user-friendly web interface that can display various integrated and interchangeable backgrounds, a series of data layers that can be selected or deselected, a series of visual indicators to aid in decision-making, and different functionalities such as quantitative, qualitative, date filters, and time sliders. Using GIS and automation tools, the state of the bee's environment can be analyzed. With the help of GIS and statistics allowing the creation of indexes, an approach to calculate beekeeping potential can be applied using spatial data layers. These

	results are sent to the dashboard in the form of spatial layers and indicators. One of the challenges of this project is to implement a data management system for multisource data of a wide variety of resolutions (spatial, temporal, descriptive, etc.). The data warehouse addresses this structural need. ETL processes allow data normalization before the creation of the data warehouse [2]. The creation of the data warehouse in this project also involves the use of automated format change tools with Python such as those of GDAL/OGR library [3]. Spatial data layers are stored in a database and processed by a multi-functional server-side (back-end) algorithm and sent through various processes to the display part (front-end) of the decision support system (DSS). The back-end environment must allow personalized access for each user. Once an account is created, users can access their personal information layers as well as those accessible to all. The algorithm has the automated decision support tools that manipulate the data warehouse as a data cube and transfers it to the DSS interface. Most of the programming code will be in Python (flask framework) and the templates for the front-end will be in web-based GUI: HTML, JavaScript and CSS. Flask framework is being used to create web application in Python [4]. The interactive web mapping interface is produced with OpenLayers, a feature-rich open-source library (JavaScript), for creating interactive maps [5]. The results of this research will help understand the ecosystems around a hive through data analysis and they can affect apiary owners financially. The research will allow beekeeping decision makers to analyze the potential of hives in the study area based on a wide range of factors. With the results of this research, beekeepers will be able to optimize or relocate their hives based on their interpretation of the results displayed in the decision support system.

Parallel Session 2

Software and Information Systems Development

16:30-17:30 (GMT+2), April 14, 2023 | Friday
Session Chair: Prof. Salah Bourennane, Ecole Centrale Marseille, France

Room ID: 81758114894 Link: https://us02web.zoom.us/j/81758114894 Onsite Meeting Room: Pierre COTTON	
Presenter	**Information**
AP2009 16:30-16:50	**A Flexible Approach for Solving Quality Issues by Means of Collecting Runtime Data** Uwe Hohenstein, Siemens AG, Germany This paper presents an approach to solve specific quality issues in an industrial project. Some use cases are discussed that tackle quality and refactoring challenges. The solution con-sists of adding a few new reusable components to the existing code base of the project to achieve a flexible and configurable collection of runtime data. This runtime data is subsequently used to identify quality issues whereupon refactoring can take place. The paper demonstrates in detail the benefits of using aspect-orientation, particularly the AspectJ language, and reports on experiences.
AP0005 16:50-17:10	**Monitoring of Statistical Data on GHG Emissions using GIS: A Review** Gustė Metrikaitytė, Vilnius Gediminas technical university Department of Geodesy and Cadaster, Lithuania The aim of this work is to analyse greenhouse gases (GHGs), their emissions in the agricultural sector, and the possibility of monitoring them through remote sensing (RS) and data-driven solutions. This paper analysed the GHG emission reports of 43 member countries that are regularly submitted to the Secretariat of the United Nations Framework Convention on Climate Change. The analysis highlighted Sweden's leadership in the energy sector, where up to 66% of its electricity comes from renewable sources. New Zealand also stood out in the context of all countries, with very high methane (CH4) emissions due to the country's large livestock population and poor emission controls in the agri-cultural sector. The article also provided an overview of the satellites currently available on the market for monitoring GHG emissions and a partial analysis of their characteristics. Future work is planned to further investigate the applicabil-ity of satellites for monitoring GHG emissions, to provide a detailed analysis of the characteristics of public, commercial, and hybrid satellites, to carry out prac-tical applications of satellite data for the determination of agricultural emissions, and to develop a methodology for continuous emissions monitoring.

Room ID: 81758114894 Link: https://us02web.zoom.us/j/81758114894 Onsite Meeting Room: Pierre COTTON	
Presenter	**Information**
AP0010 17:10-17:30	**Geospatial and multivariate analysis of under-five stunting children in Rwanda using DHS 2020** Similien Ndagijimana, African Centre of Excellence in Data Science, Biostatistics, University of Rwanda, Kigali-Rwanda Background: Malnutrition is a major public health concern worldwide; a recent study found that 22% of children under the age of five were stunted worldwide in 2020. Stunting in Rwanda has decreased dramatically over the last 15 years, from 51% in 2005 to 33% by 2020. However, because few geospatial studies have been conducted, geographical survey data analysis is required to effectively focus stakeholders' efforts in response to successful stewardship of health programs in the eradication of all types of malnutrition. The study's goal is to map the prevalence distribution of stunted children under the age of five, make Projections, and provide exceedance probability maps for each stunting at the 30% threshold value, as well as identify risk factors associated with stunting in Rwanda.

Parallel SESSION 3

Service and Application Software Design and Testing (Online Only)

09:30-11:10 (GMT+2), April 15, 2023 | Saturday

Session Chair: TBA

Room ID: 81758114894 Meeting Link: https://us02web.zoom.us/j/81758114894	
Presenter	**Information**
AP2013 09:30-9:50	**MEC Applications Deployment and TCP Testing Using Simu5G** Aalwahab Dhulfiqar, Eötvös Loránd University, Hungary Multi-Access Edge Computing (MEC) is a brandnew paradigm for application development since it places a near server between the client and the conventional remote server to provide cloud computing services at the network's edge and closer to the consumers. Particularly low latency, high bandwidth, realtime access to radio networks, position awareness, and flexible and expandable architecture for the services are advantages of this novel approach. This work analyses the performance of the MEC edge computing network without TCP and with TCP algorithms (TCP Reno, TCP NewReno, TCP Dump) under a 5G network. The performance analysis is done using a Simu5G tool. Results show that TCP NewReno is more compatible with MEC-5G network in terms of signal strength, and queue utilities.
AP0004 09:50-10:10	**Spatio-temporal Analysis of Mobile Phone and Social Media Data Across Multiple Disaster Scenarios: An Input to Population Exposure Assessment** Bernadette Joy Detera, Keio University, Japan Understanding what people need during disasters and how many people are exposed to disasters are critical in effective disaster management especially in urban megacities where high population density poses greater disaster risk. More importantly, analyzing how disaster needs and population vary through time is becoming as critical for modelling population exposure to hazards, which can aid disaster risk estimation and mitigation. Although traditional data collection methods such as remote sensing data are available, it is still a challenge to estimate exposure and analyze dynamic changes in a high temporal resolution. This paper investigates the use of spatio-temporal big data as an input in population exposure assessment across multiple disaster scenarios in Tokyo. Specifically, we demonstrate this through case studies on natural disasters typhoon and earthquake, as well as abnormal scenarios such as heavy snowfall in the city. We utilize geoinformation (e.g., GPS traces) from mobile phone users in Japan, extract trajectory and search query data, and analyze population changes and trends at hourly temporal resolution during disasters. Moreover, we compare the intensity of changes with normal times to delineate extent of exposure. In addition, we collect geo-tagged social media data from Twitter in the same location to analyze hourly trend of tweet volume. By utilizing this method, we are able to get better understanding of the intensity and dynamic trend of the population affected by the disaster at a high temporal resolution (i.e., hourly) which can aid population.

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Presenter	**Information**
	exposure assessment for disaster risk management
AP0016 10:10-10:30	**Design for Wharf Quality Evaluation Service Platform Based on WebGIS** Chuanyi Liao, University of Electronic Science and Technology of China As a meeting point of multiple transportation modes such as land, water, and pipeline, the wharf has always been an important transportation hub in my country. With the development of the economy, the excessive use of wharves has caused many hidden dangers in quality and safety. However the traditional quality evaluation methods are complicated and cumbersome, and the results are not intuitive. Therefore, by analyzing the demand for wharf quality evaluation services and combining it with web geographic information systems, this article uses the Yangtze River Delta and Lianyungang wharf's data as research data, uses Angular framework, PostgreSQL, Leaflet, and other technologies to build a wharf quality evaluation service platform based on WebGIS that is compatible with all major browsers. This platform realizes the functions of spatial information visualization, viewing of attribute information, multi-mode data query, calculation of reinforced concrete strength, and concrete corrosion potential evaluation services. The platform can not only visually display the quality level of the wharf, but also provide quality evaluation services through dynamic interaction, which is of great significance to the management and evaluation of wharf quality information.
AP2003 10:30-10:50	**The Role of Implementation-Specific Static Analysis** Norbert Pataki, Eötvös Loránd University, Hungary C++ Standard Template Library (STL) is the most well-known library based on the generic programming paradigm. Unfortunately, C++ compilers cannot validate the usage of the library comprehensively. Classical problems (e.g. memory leak) can be solved with the STL, however, new kinds of errors appeared. Using static analysis is a feasible way to achieve an improved validation of the C++ STL's usage. In this paper, we describe cases when special analysis can be applied for the reduction of false positive findings. We present our tool for detecting internal copies of stateful predicates in the library implementation that can be a subtle headache during development. We evaluate our tool with open source projects.
AP2005 10:50-11:10	**A Benchmark for Design Pattern Recovery Tools** Mohammed Ghazi Al-Obeidallah, AL Ain University, United Arab Emirates Design patterns provide reusable solutions to common design problems. Several tools and approaches were presented in the literature to recover the instances of design patterns. However, there is no standard benchmark to validate the recovered design pattern instances. This paper presents a benchmark that involves the instances of design patterns recovered from three subject systems. This benchmark has been developed by investigating the design pattern instances recovered by several recovery tools. Our benchmark can be used by design pattern recovery tools to validate their recovered design instances.

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