

CONFERENCE PROGRAM

ESSE 2023

The 4th European Symposium on
Software Engineering

SPRA 2023

The 4th Symposium on
Pattern Recognition and Applications

December 1-3, 2023 | Napoli, Italy

Co-sponsored by



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Welcome Message

You are immensely welcome to attend ESSE 2023: The 4th European Symposium on Software Engineering & SPRA 2023: The 4th Symposium on Pattern Recognition and Applications. ESSE & SPRA 2023 aims to build an ideal academic platform for the purpose of encouraging researcher participating in this event.

The conference focuses on the trending, highly popular, but exciting and extremely challenging areas from our keynote speakers of leading scientists and a variety of authors around the world. The outcome of our deliberations will play a crucial role in progress achieved in these areas.

The conference brings together researchers looking for opportunities for conversations that cross the traditional discipline boundaries and allows them to resolve multidisciplinary challenging problems. It is the clear intent of the conference to offer excellent mentoring opportunities to participants. Through this virtual platform, we trust that you will be able to share the state-of-the-art developments and the cutting-edge technologies in these broad areas.

We have the conference for three days. There will be 3 keynote speeches and 2 sessions.

Special thanks are extended to our colleagues in program committee for their thorough reviews of all the submissions, which are vital to the success of the conference, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference. Last but not least, our special thanks go to speakers as well as all the authors for contributing their latest researches to the conference.

In closing, we thank you for participating in ESSE & SPRA 2023 and we hope you enjoy the next three days.

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2023/12/1-3

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Overall Agenda

Day 1 Dec. 1, 2023 Friday	
10:00-12:00	ZOOM Test
Day 2 Dec. 2, 2023 Saturday	
10:00-12:15	Opening Remarks & Keynote Speeches
13:30-15:00	Sessions 1 - Software Design and Data Management
Day 3 Dec. 3, 2023 Sunday	
10:00-11:30	Sessions 2 - Digital Image Analysis and Processing

Sessions at a Glance	
Session 1:	SS0156, SS0161, SS0164, SS0140, SS0198, SS0173
Session 2:	SS045, SS0125, SS0110, SS035, SS0115, SS0135

ZOOM ID for All Sessions
819 9613 4663

Guideline & Tips

Before the Conference

Time Zone

Napoli, Italy Time (GMT / UTC+1)

You're suggested to set up the time on your computer in advance.

Platform: ZOOM

Download link:

1. <https://zoom.us/download>
2. <https://zoom.com.cn/download> (Chinese authors only)

Equipment Needed

- ◆ A computer with internet connection and camera
- ◆ Headphone/earphone

Environment Needed

- ◆ A quiet place
- ◆ Stable internet connection
- ◆ Proper lighting and background

Test Your Presentation

Date: Dec. 1, 2023

Prior to the formal meeting, presenters shall join the test room to ensure everything is on the right track.

During the Conference

Name

Name yourself with your paper ID + Name

Example: SS001+Mary

Voice Control Rules

- ◆ The host will mute all participants while entering the meeting.
- ◆ The host will unmute the speakers' microphone when it is turn for his or her presentation.
- ◆ Q&A goes after each speaker, the participant can raise hand for questions, and the host will unmute the questioner.
- ◆ After Q&A, the host will mute all participants and welcome next speaker.

Oral Presentation

Timing: a maximum of 15 minutes in total, including 3 minutes for Q&A. Please make sure your presentation is well timed.

Conference Recording

The whole conference will be recorded. We appreciate you proper behavior and appearance

Daily Schedule

Day 1 Dec. 1, 2023 Friday	
10:00-11:00	ZOOM Test for Keynote Speakers & Session Chairs
11:00-12:00	ZOOM Test for Session 1-2
Day 2 Dec. 2, 2023 Saturday	
Host: Vassilis C. Gerogiannis, University of Thessaly, Greece	
10:00-10:05	Opening Remarks
10:05-10:45	Keynote Speaker I-Prof. Habib Zaidi, Geneva University Hospital. FIEEE, FAIMBE, FAAPM, FIOMP
10:45-11:25	Keynote speaker II-Yannis Manolopoulos, Open University of Cyprus
11:25-11:35	Break
11:35-12:15	Keynote speaker III-David Benavides, University of Seville, Spain
12:15-13:30	Break
13:30-15:00	Session 1- Software Design and Data Management
Day 3 Dec. 3, 2023 Sunday	
10:00-11:30	Session 2- Digital Image Analysis and Processing

ZOOM ID for All Sessions

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Keynote Speech I



Speech Title: Artificial Intelligence-Powered Multimodality Medical Image Analysis

Prof. Habib Zaidi, Geneva University Hospital
Ph.D, FIEEE, FAIMBE, FAAPM, FIOMP



10: 05-10: 45 | Dec. 2, 2023

ZOOM ID: 819 9613 4663 | <https://us02web.zoom.us/j/81996134663>

Biography: Professor Habib Zaidi is Chief physicist and head of the PET Instrumentation & Neuroimaging Laboratory at Geneva University Hospital and faculty member at the medical school of Geneva University. He is also a Professor at the University of Groningen (Netherlands) and the University of Southern Denmark. His research is supported by the Swiss National Foundation, the European Commission, private foundations and industry (Total 8.8M US\$) and centres on hybrid imaging instrumentation (PET/CT and PET/MRI), computational modelling and radiation dosimetry and deep learning. He was guest editor for 12 special issues of peer-reviewed journals and serves on the editorial board of leading journals in medical physics and medical imaging. He has been elevated to the grade of fellow of the IEEE, AIMBE, AAPM, IOMP, AAIA and the BIR. His academic accomplishments in the area of quantitative PET imaging have been well recognized by his peers since he is a recipient of many awards and distinctions among which the prestigious (100'000\$) 2010 Kuwait Prize of Applied sciences (known as the Middle Eastern Nobel Prize). Prof. Zaidi has been an invited speaker of over 160 keynote lectures and talks at an international level, has authored over 378 peer-reviewed articles (h-index=73, >19'300+ citations) in prominent journals and is the editor of four textbooks.

Abstract: Positron emission tomography (PET), x-ray computed tomography (CT) and magnetic resonance imaging (MRI) and their combinations (PET/CT and PET/MRI) provide powerful multimodality techniques for in vivo imaging. This talk presents the fundamental principles of multimodality imaging and reviews the major applications of artificial intelligence (AI), in particular deep learning approaches, in multimodality medical imaging. It will inform the audience about a series of advanced development recently carried out at the PET instrumentation & Neuroimaging Lab of Geneva University Hospital and other active research groups. To this end, the applications of deep learning in five generic fields of multimodality medical imaging, including imaging instrumentation design, image denoising (low-dose imaging), image reconstruction quantification and segmentation, radiation dosimetry and computer-aided diagnosis and outcome prediction are discussed. Deep learning algorithms have been widely utilized in various medical image analysis problems owing to the promising results achieved in image reconstruction, segmentation, regression, denoising (low-dose scanning) and radiomics analysis. This talk reflects the tremendous increase in interest in quantitative molecular imaging using deep learning techniques in the past decade to improve image quality and to obtain quantitatively accurate data from dedicated standalone (CT, MRI, SPECT, PET) and combined PET/CT and PET/MRI imaging systems. The deployment of AI-based methods when exposed to a different test dataset requires ensuring that the developed model has sufficient generalizability. This is an important part of quality control measures prior to implementation in the clinic. Novel deep learning techniques are revolutionizing clinical practice and are now offering unique capabilities to the clinical medical imaging community. Future opportunities and the challenges facing the adoption of deep learning approaches and their role in molecular imaging research are also addressed.

Keynote Speech II



Speech Title: [Recommending Systems in Scholar Publishing](#)

Prof. Yannis Manolopoulos, Open University of Cyprus



10: 45-11: 25 | Dec. 2, 2023

ZOOM ID: 819 9613 4663 | <https://us02web.zoom.us/j/81996134663>

Biography: Yannis Manolopoulos is Professor of the Open University of Cyprus, as well as Professor Emeritus of the Aristotle University of Thessaloniki. Moreover, he is Member of Academia Europaea, London. He has been with the University of Toronto, the University of Maryland at College Park, the University of Cyprus and the Hellenic Open University. He has served as Vice-Rector of the Open University of Cyprus, President of the Board of the University of Western Macedonia in Greece and Vice-President of the Greek Computer Society. Currently, he is Member of the Board of the Research and Innovation Foundation of Cyprus.

His research interest focuses in Data Management. He has co-authored 6 monographs and 10 textbooks (in Greek), as well as >350 journal and conference papers. He has received >17500 citations from >2600 distinct academic institutions from >100 countries (h-index=60 according to Google Scholar, d-index=61 according to Research.com). He has also received 5 best paper awards from SIGMOD, ECML/PKDD, MEDES (2) and ISSPIT conferences. Currently, he serves in the Editorial Boards of the following journals (among others): Digital (Editor-in-Chief), The Computer Journal (Deputy Editor), Information Systems, World Wide Web, Expert Systems, Data Science & Analytics.

Abstract: The area of Recommendation Systems has matured after intensive theoretical studies by researchers and practical applications by large e-commerce companies. On the other hand, the area of Scientometrics and Bibliometrics has become an independent field, focusing in the study of laws and statistics related to scholarly publications. Nowadays, the publishing industry has accumulated big bibliographic data. Thus, the need to provide recommendations when searching in the abundance of bibliographic data has arisen.

- Journal recommenders are important tools for researchers as many journals belonging to different publishers have emerged.
- Conference recommenders are useful towards avoiding predatory ones.
- Citation recommenders play an important role to alleviate the dilemma that researchers spend a lot of time and experiences for literature survey.
- Reviewer recommenders for scientific research proposals are helpful tools for funding agencies.
- Article recommendation to best-fit reviewers is crucial to achieve constructive reviews towards a strong conference program.
- Collaborator Recommenders learn from researchers' publications and advice about persons, which can give research directions.

These are some fundamental research questions in the intersection area between Recommendation Systems and Scientometrics and Bibliometrics. In this talk, key approaches for each question will be presented, discussed and compared.

Keynote Speech III



Speech Title: Data-Intensive Product Lines: Embracing Past Results and New Variability Challenges

Prof. David Benavides, University of Seville



11: 35-12: 15 | Dec. 2, 2023

ZOOM ID: 819 9613 4663 | <https://us02web.zoom.us/j/81996134663>

Biography: Prof. David Benavides received the B.S. degree in information systems from the Institute Supérieur d'Electronique de Paris, France, in 2000, and the M.Sc. degree in computer engineering and the Ph.D. degree in software engineering from the University of Seville, Spain, in 2001 and 2007, respectively. He is currently a Full Professor with the University of Seville. He received the SPL Most Influential paper award in 2017 for his 2005 paper on feature model analysis that opened a new field of research. Also, Prof. Benavides received the most influential paper award at VaMoS 2020 for his paper about FaMa, a Java tool for feature model analysis that has been widely used in academia and industry. In 2012, he served as PC chair at SPLC in Salvador, Brasil, and from 2018 to 2022 he served as SPLC Steering Committee Chair. He has been more than 20 years researching around software product lines and variability, both theoretically and practically. He is the head of the Diverso Lab at the University of Sevilla.

Abstract: In the realm of software product line engineering, feature models have been a cornerstone for over three decades. As we enter a new era defined by the digital revolution, the value of data across diverse application domains is becoming increasingly apparent. This paradigm shift towards data-intensive environments poses fresh challenges that must be addressed through variability management. Data transformation, visualization, generation, and synthesis present ripe opportunities for leveraging variability techniques. Moreover, the growing prominence of data-intensive product lines emphasizes the need to adapt and innovate in this context. This keynote explores past achievements and contributions while charting a course to embrace these novel variability challenges in data-intensive product lines. The convergence of variability knowledge and data-driven applications can profoundly shape the future of software product line engineering.

Provocative note: This text have been refined with the help of an LLMs.

[13: 30-15: 00 Day 2 | Dec. 2, 2023 | Saturday]

Session 1 - Software Design and Data Management

Session Chair: Prof. Yannis Manolopoulos, Open University of Cyprus

ZOOM ID: 819 9613 4663 | <https://us02web.zoom.us/j/81996134663>

A Practical Failure Prediction Model based on Code Smells and Software Development Metrics

Associate Prof. Reinhold Ploesch, Martin Schütz

Johannes Kepler University Linz, Austria

SS0156
13:30-13:45

Abstract: Making errors during software development is unavoidable. Developers inevitably make errors that take additional time to fix later. Consequently, efforts for bug fixing compete with implementing new features. Typically, the later bugs are found, the higher the cost for remediation. To address this concern, software testing should start as early as possible in software development lifecycle. For this purpose, static analysis is proposed, but typically shows too many findings and hence do not support development teams appropriately. So, it would be a benefit to premature detect those findings in static analysis that will result in failures to reduce subsequent efforts notably. The purpose of the paper is to analyze failure data from issue tracking systems that are correlated to findings from static analysis. Thereupon an artificial intelligence-based approach is used to train practicable models for business environment that enables effective prediction of software faults. The results from static analysis show that predefined complexity measures encompassed the most defects. While there are commonalities in relevant defect findings in static analysis reports, meaningful prediction models cannot be expected based solely on this data. In addition to the findings of the static analysis, metrics like code changes in a time period or number of authors involved in code changes were considered for building the prediction models. Two of the developed prediction models have a high accuracy and excellent utility rate. These resulting prediction models are currently used at Raiffeisen Software GmbH for a long-term study on failure prediction based on code smells.

Towards a Globally Distributed Testing Network in the Automotive

Mr. Denesa Zyberaj, Pascal Hirmer, Marco Aiello

Mercedes-Benz, University of Stuttgart, Germany

SS0161
13:45-14:00

Abstract: Digitalization has transformed many aspects of our lives, particularly in the automotive industry, where it has significantly impacted how cars are built, tested, and operated. Car manufacturers are increasingly required to shift their focus from hardware to software, a change that is accelerated by the rise of electric vehicles. As the industry increasingly embraces a tech company identity, software-based approaches and new technologies can enhance existing processes, reduce costs, and generate revenue. The integration testing of car electronic control units (ECUs) is a prime example of an area that can be optimized through software-based approaches. In the traditional process, suppliers design and create ECUs and their corresponding software in various locations worldwide. Once completed, the units are shipped to a central location where the automaker physically connects them and conducts integration tests. However, this process can lead to expensive iterations because of found errors, which a virtual approach can address. An initial approach towards early integration testing through a globally accessible virtual testing platform is presented in this paper. Suppliers can leverage such a platform to connect their newly built ECUs, allowing car manufacturers to conduct integration tests early in the ECU's life cycle. This, in turn, reduces the overhead associated with physical transportation and facilitates early feedback, which can help identify and address issues much earlier in the development process. Overall, the proposed approach has great potential to enhance the integration testing process,

	<p>resulting in significant benefits for all stakeholders involved. The contributions of this paper include an initial approach towards (i) a generic test specification that enables the definition of integration tests involving virtual and physical ECUs, distributed among different suppliers, (ii) a hardware interface that enables suppliers to connect their ECUs to a virtual test environment remotely, and (iii) an initial architecture for the virtual test platform, which allows integration testing throughout multiple distributed ECUs.</p>
<p>SS0164 14:00-14:15</p>	<p>Automotive Software Partitioning: A Production-Centric Perspective Mr. Yi Zhai, Michael Hahn, Mario Caggiano, Eric Sax Mercedes-Benz AG, Germany</p> <p>Abstract: Partitioning the software artifacts is a powerful technique to enhance modularity and manage the complexity of software systems. In the automotive industry, software partitioning is commonly used to isolate vehicular functions from various domains or vendors to accelerate function integration processes. This paper proposes a novel perspective on software partitioning for automotive software systems and demonstrates a redundancy-based approach that isolates the production-relevant part from the monolithic in-car software. This strategy can aid in reducing issues caused by frequent software updates and improving car assembly efficiency by reducing in-line flashing time. The paper also presents an overview of the costs and drawbacks associated with the proposed software partitioning approach.</p>
<p>SS0140 14:15-14:30</p>	<p>Transforming Tourism Experience: AI-Based Smart Travel Platform Dr. Şuayb Talha Özçelik, Meltem Turhan Yöndem, Inês Caetano, Patrícia Alves, Hüseyin Bahtiyar, Fernando Perales, George Suci Setur - IT and R&D Center, Türkiye</p> <p>Abstract: In this paper, we propose the development of a novel personalized tourism platform incorporating artificial intelligence (AI) and augmented reality (AR) technologies to enhance the smart tourism experience. The platform utilizes various data sources, including travel history, user activity, and personality assessments, combined with machine learning algorithms to generate tailored travel recommendations for individual users. We implemented fundamental requirements for the platform: secure user identification using blockchain technology and provision of personalized services based on user interests and preferences. By addressing these requirements, the platform aims to increase tourist satisfaction and improve the efficiency of the tourism industry. In collaboration with various universities and companies, this multinational project aims to create a versatile platform that can seamlessly integrate new smart tourism units, providing an engaging, educational, and enjoyable experience for users.</p>
<p>SS0198 14:30-14:45</p>	<p>Imposing Cache: Busy-Aware Cooperative Data Caching in Edge-Cloud Environments Mr. Gyujeong Lim, Jihun Kang, Heonchang Yu Korea University, South Korea</p> <p>Abstract: Data caching and placement are essential for reducing latency and increasing performance. With the correct allocation, users can access frequently used data faster while reducing the load on network bandwidth and resources. However, with the ever-changing virtual systems, caching methods must also adapt to fit in them. For example, cloud services no longer operate by only having a single powerful node such as a data center. Instead, services also deploy edge nodes, which can hold data closer to the users, thus reducing latency and improving quality. As a result, there are various studies and developments to make caching more efficient than ever. In this paper, we focus on what we call imposing cache, a method that allows nodes to cache on other nodes as if it were their own, as long as they are part of the same group, we call EdgeGroup. Additionally, our method is busy-aware enabling cloud and edge nodes to check on each other's availability and adjust their decision-making process so that unavailable nodes are not taken into consideration. Our method succeeded in reducing fetches from Cloud by around 33% compared to</p>

normal caching methods. Also, it reduced request completion time by around 3 minutes due to the fact that it could correctly identify busy nodes and suspend them accordingly

Which bug reports are valid and why? Using the BERT transformer to classify bug reports and explain their validity

Dr. Qianru Meng, Visser Joost
Leiden University, Netherlands

SS0173
14:45-15:00

Abstract: Defects and other issues regarding quality and performance of software systems are reported and stored in defect-tracking systems. For software developers, classifying valid bug reports in large defect repositories is challenging. Partly, this is because bug reports commonly contain noise and domain-specific terms. Deep learning, with its strong learning ability from complex text, offers a solution to this issue. However, merely focusing on the performance of the model is not sufficient - clarifying the classification decisions of the system holds equal significance. Our method uses BERT to perform the bug report validity classification task, and we test various mechanisms to explain the classification. Through rigorous evaluation on five open source datasets and benchmarking BERT's performance against CNN, we demonstrate significant improvements in recall, precision, and F1 score. Importantly, through the evaluation of results from three explanation techniques, our method effectively identifies key features essential to the validity and quality of bug reports.

[10:00-11:30 Day 3 | Dec. 3, 2023 | Sunday]

Session 2-Digital Image Analysis and Processing

Session Chair: Dr. Apostolos Xenakis, University of Thessaly, Greece

ZOOM ID: 819 9613 4663 | <https://us02web.zoom.us/j/81996134663>

<p>SS045 10:00-10:15</p>	<p>Effects of Hyper-Parameters in Online Constrained Clustering: A Study on Animal Videos Francis James Williams, Ludmila Ilieva Kuncheva Bangor University, UK</p> <p>The aim of online clustering is to discover a structure in running data. Adding label constraints or pairwise constraints to this has shown to improve the clustering accuracy. In this study we present an analysis of how different hyperparameters – proportion of constraints, initial number of clusters, and batch window size – affect most recent and popular online constrained clustering methods, using three different metrics. Our results show that initial number of clusters and window size have an effect on clustering results, while the proportion of constraints does not. We also demonstrate that online clustering performs better than clustering of the whole data together. Our overall findings point at the need for new, more effective online constrained clustering methods.</p>
<p>SS0125 10:15-10:30</p>	<p>Efficient Pneumonia Detection in Chest X-ray Images: Leveraging Lightweight Transfer Learning for Improved Accuracy and Practicality Ms. Bibi Qurat Ul Ain, Bingcai Chen Dalian University of Technology, China;</p> <p>Abstract: Pneumonia is a leading cause of death worldwide, particularly in Pakistan. However, it is challenging to recognize pneumonia by examining chest radiographs, even for expert radiologists. Chest X-ray (CXR) images serve as a primary means of pneumonia detection. However, manual interpretation by radiologists is challenging, necessitating the development of automatic computer-aided diagnostic systems to enhance accuracy. Recent literature has explored diverse deep learning algorithms for pneumonia detection, but their practicality is limited by high computational demands and the need for fast GPUs. In this study, a lightweight approach leveraging transfer learning of pre-trained architectures (SSD MobileNet V2, SSD MobileNet V2 FPNLite 320x320, and SSD MobileNet V2 FPNLite 640x640) was employed, followed by comparative analysis of these pre-trained models for pneumonia detection. The proposed models underwent extensive testing in various scenarios, employing different dataset distributions, hyper-parameters, classification loss functions, and image pre-processing techniques using a set of evaluation metrics. The SSD MobileNetV2, SSD MobileNetV2 FPNLite 320x320, and SSD MobileNetV2 FPNLite 640x640 models achieved mAP scores of 76%, 85%, and 80%, respectively, alongside accuracies of 81.3%, 94.6%, and 92.6% on an unseen dataset from the Ghuangzhou Women and Children's Medical Center pneumonia dataset. Notably, the SSD MobileNetV2 FPNLite 320x320 model exhibited superior performance among the three. These findings demonstrate great potential in accurately detecting pneumonia cases in medical images, offering computational efficiency, cost-effectiveness, and faster results compared to existing methods in the literature.</p>
<p>SS0110 10:30-10:45</p>	<p>SensorLib: an Energy-efficient Sensor-collection Library for Wear OS Dr. Lorenzo Calisti, EMANUELE LATTANZI University of Urbino, Italy</p> <p>Abstract: In recent years, wearable technology has gained popularity due to features like long battery life, network connectivity, and fitness monitoring. Human Activity Recognition has emerged as a popular use case for smartwatches, enabling the recognition of activities starting from internal sensors. Data acquisition from sensors is crucial in wearable devices because if not properly implemented can reduce battery life or device responsiveness. The paper presents an energy-</p>

	<p>efficient programming library for real-time sensor sampling on smartwatches using native Wear OS sensor APIs. The library's implementation is evaluated on a real smartwatch for code size, memory utilization, and power consumption. The preliminary results empirically demonstrate that the solution proved to be light and versatile enough to be used on wearable devices without heavily compromising battery life and system performance.</p>
<p>SS035 10:45-11:00</p>	<p>Chinese Multi-Dialect Speech Recognition Based on Instruction Tuning Timin Ding, Dalian University of Technology, China</p> <p>Abstract: The technology of Chinese dialect speech recognition contributes to the preservation and inheritance of regional culture, as well as providing more convenient and customized services, with broad application prospects. In recent years, end-to-end speech recognition methods have demonstrated strong performance in dialect recognition. However, training the model using only a single dialect dataset would cause the model to lose the commonalities in acoustics and linguistics at a broader level. On the other hand, directly training a single model with multiple dialects would overlook the differences between dialect texts, thus affecting the model's performance. To address this issue, this paper proposes a Chinese multi-dialect speech recognition method based on instruction tuning. By adding different instruction sets before different dialect texts, the model can learn the commonalities among different dialects within the same language while preserving the differences between dialect texts. Additionally, this paper also attempts to enhance the model's text generation capability by using an additional language model for rescoring the model outputs. We conducted tests on the Common Voice dataset using the Whisper model. The results show that compared to the method of direct mixed training, the instruction fine-tuning method and rescoring method reduced the Word Error Rate (WER) by 13.44% and 13.75% respectively.</p>
<p>SS0115 11:00-11:15</p>	<p>Using Quantum Monte Carlo Simulation to Price Complicated Derivatives in the Big Data Environment Dr. Gen Chen, Lin Wang Guangdong University of Finance and Economics, China</p> <p>Abstract: Since the beginning of the 21st century, the scale and complexity of financial derivatives have increased significantly. Meanwhile, the pricing models of derivatives have become increasingly complex, and have involved larger-scale data, posing unprecedented challenges to algorithms and computing speed. Although classical computing can still solve the pricing problem of some complex derivatives by adopting the big data simulation algorithms, its speed has become more and more difficult to meet the needs of real-time computing. In recent years, the emerging quantum computing makes full use of the advantages of quantum superposition to improve the computing speed and accuracy. It has been proven to be an efficient computing mode in the big data simulation. This paper takes the pricing of European options and defaultable bonds as examples to explore the application of Quantum Monte Carlo Simulation of complicated derivative pricing in the big data environment. The innovative comprehensive method of pricing derivatives by Quantum Monte Carlo Simulation provides new development for the application of quantum computing in the pricing of complicated financial derivatives (taking defaultable bond as example) in the big data environment. In the case of defaultable bond pricing, the Quantum Amplitude Estimation has been employed to speed up the Monte Carlo Simulation and the price of it has been successfully obtained with at least the same accuracy, which demonstrates that the Quantum Monte Carlo Simulation is an efficient approach to price the complicated derivatives based on the big data since the quantum bits has dramatically increased.</p>
<p>SS0135 11:15-11:30</p>	<p>Difficulties in Object-Oriented Design and its relationship with Abstraction: A Systematic Review of Literature Pamela Catherine Flores, Ismael Sebastian Rivas, Jenny Gabriela Torres Escuela Politécnica Nacional, Ecuador</p>

Abstract: Object-oriented approach is a different way of thinking about software in terms of modularity and abstraction of concepts through the modeling of system components. According to the literature, students have several difficulties while designing software, a lack of understanding of basic object-oriented design concepts is especially noticeable. However, from a cognitive point of view, one of the pillars on which software design is supported is abstraction, there is an evident need to refine research efforts to correct lack of knowledge revealed by these difficulties in software design and, specifically, in abstraction. With this intention, it has been carried out a literature review through a qualitative research based on the Kitchenham methodology. This study helps us to know the difficulties that designers face when modeling systems in order to understand which and how these difficulties are related to abstraction. The findings invited us to establish a classification of the difficulties in software design that were found in the literature and to determine the existence of the levels of abstraction that various authors perceive in this regard. Among the difficulties encountered are the lack of students' perception that the classes represent a real phenomenon, the transition from structural to object-oriented programming and the movement between levels of abstraction.

Thank you!