

APPLIED COMPUTING 2024

The 39th Annual ACM Symposium on Applied Computing

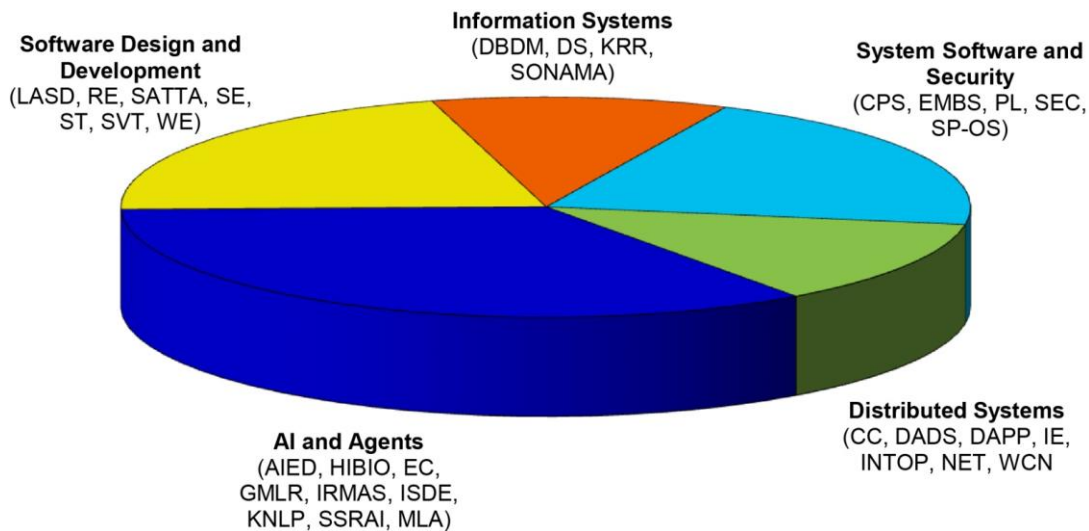
PROCEEDINGS OF THE 2024 ACM
SYMPOSIUM ON APPLIED COMPUTING

Avila, Spain
April 8 – April 12, 2024

Organizing Committee

Jiman Hong
Juw Won Park
Marin Lujak
Ana Belén Gil
Hossain Shahriar

Fernando de la Prieta Pintado
Adam Przybyłek
John Kim
Sara Rodriguez Gongalez
Junyoung Heo



Hosted by
University of Salamanca, Spain

***** SAC 2024 at Glance *****

Monday 04/08/2024	Tuesday 04/09/2024	Wednesday 04/10/2024	Thursday 04/11/2024	Friday 04/12/2024
	<p>Opening & Keynote Session I (9:30am – 11:00am) Chamber Hall</p> <p>Coffee Break (11am – 11:30am)</p> <p>AM Breakout Sessions (11:30am – 1:00pm)</p>	<p>AM Breakout Sessions (9:30am – 11:00am)</p> <p>Coffee Break (11am – 11:30am)</p> <p>AM Breakout Sessions (11:30am – 1:00pm)</p> <p>AM Posters Session (11:00am – 1:00pm)</p>	<p>Keynote Session (10am – 11:00am) Chamber Hall</p> <p>Coffee Break (11am – 11:30am)</p> <p>AM Breakout Sessions (11:30am – 1:00pm)</p>	<p>SIGAPP Wrap-up Meeting (10am – noon)</p>
	<p>SAC Luncheon For all Registered Attendees (1:00pm – 2:30pm) Congress Hall</p>	<p>SAC Luncheon For all Registered Attendees (1:00pm – 2:30pm) Congress Hall</p>	<p>SAC Luncheon For all Registered Attendees (1:00pm – 2:30pm) Congress Hall</p>	<p>The Conference Ends at 12:30pm Thank you for your participation and we hope to see you all next year</p>
<p>Tutorials (2:30pm – 6:30pm)</p>	<p>PM Breakout Sessions (2:30pm – 4:00pm)</p> <p>Coffee Break (4:00pm – 4:30pm)</p> <p>PM Breakout Sessions (4:30pm – 6:00pm)</p> <p>SRC Poster Exhibit (4:00pm – 6:00pm)</p>	<p>PM Breakout Sessions (2:30pm – 4:00pm)</p> <p>Coffee Break (4:00pm – 4:30pm)</p> <p>PM Breakout Sessions (4:30pm – 5:30pm)</p> <p>PM Posters Session (3:00pm – 5:00pm)</p>	<p>PM Breakout Sessions (2:30pm – 4:00pm)</p> <p>Coffee Break (4:00pm – 4:30pm)</p> <p>PM Breakout Sessions (4:30pm – 6:00pm)</p> <p>SRC Oral Presentations (4:00pm – 6:00pm)</p>	
	<p>Future SAC Organization Meeting (6:00pm – 7:00pm)</p> <p>SIGAPP Reception (7:30pm – 9:30pm) Congress Hall</p>	<p>SIGAPP Annual Business Meeting (5:30pm – 7:00pm)</p>	<p>Track Chairs Meeting (6:00pm – 7:00pm)</p> <p>SAC Banquet (8:00pm – 11:00pm) Hotel “Palacio de los Velada”</p>	

**** SAC 2024 Session Schedule ****

Monday April 08, 2024

Tutorial Sessions – Please see more on Tutorials Page

Tuesday April 9, 2024				
Room	9:30am – 11:00am	11:30am – 1:00pm	2:30pm - 4:00pm	4:30pm - 6:00pm
Room 1	Opening/Keynote Address #1 (Chamber Hall, 0 floor)	DAPP(4)	CC(3)	DADS(4)
Room 2		ISDE(5)	HIBIO(4)	IRMAS(4)
Room 3		KNLP(4)	CPS-1(4)	CPS-2(4)
Press Room		AIED-1(5)	AIED-2(5)	GMLR(4)
Room Mirador		SATT(4)	WE(3)	EC(3)
Hallway (0 floor)		SRC Poster Exhibit (4-6pm)		

Wednesday April 10, 2024				
Room	9:30am – 11:00am	11:30am – 1:00pm	2:30pm - 4:00pm	4:30pm - 5:30pm
Room 1	SSRAI-1(4)	SSRAI-2(3)	MLA-1(5)	MLA-2(3)
Room 2	RE(4)	ST(5)	LASD-1(4)	LASD-2(3)
Room 3	EMBS(5)	SP-OS(6)	SEC-1(4)	SEC-2(3)
Press Room	SONOMA(4)	KRR(5)	DBDM(5)	DS(2)
Room Mirador	INTOP(3)	WCN(5)	IE-1(4)	IE-2(2)
Hallway (0 floor)	AM Poster Session (11am-1pm)		PM Poster Session (3-5pm)	

Thursday April 11, 2024				
Room	10:00am – 11:00am	11:30am – 1:00pm	2:30pm - 4:00pm	4:30pm - 6:00pm
Room 1	Keynote Address #2 (Chamber Hall, 0 floor)	MLA-3(4)	MLA-4(4)	MLA-5(4)
Room 2		SEC-3(4)	SEC-4(4)	PL(4)
Room 3		SVT(6)	SE-1(4)	SE-2(4)
Room Mirador		NET(3)	SRC ORAL Presentation (4-6pm)	

Notes: Please note that the number inside the parentheses is the number of papers scheduled in the session. Room 1, Room 2, and Room 3 are located on Floor -1 (Basement Floor), while Room Mirador and the Press Room are located on Floor 0 (Ground Floor)

Themes and their Tracks	
AI & Agents (9)	AIED(10), EC(3), HIBIO(4), GMLR(4), IRMAS(4), ISDE(5), KNLP(4), MLA(20), SSRAI(7)
Distributed Systems (7)	CC(3), DADS(4), DAPP(4), IE(6), INTOP(3), NET(3), WCN(5)
Information Systems (4)	DBDM(5), DS(2), KRR(5), SONAMA(4)
Software Design & Development (7)	LASD(7), RE(4), SATT(4), SE(8), SVT(6), ST(5), WE(3)
System Software & Security (5)	CPS(8), EMBS(5), PL(4), SEC(15), SP-OS(6)

Theme(# of Tracks) / Track Name (# of presentations)

The Association for Computing Machinery, Inc.

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April 8 – April 12, 2024

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About the Sponsoring SIG

ACM SIGAPP

The ACM Special Interest Group on Applied Computing is ACM's primary applications-oriented SIG. Its mission is to further the interests of the computing professionals engaged in the development of new computing applications and applications areas and the transfer of computing technology to new problem domains. SIGAPP offers practitioners and researchers the opportunity to share mutual interests in innovative application fields, technology transfer, experimental computing, strategic research, and the management of computing. SIGAPP also promotes widespread cooperation among business, government, and academic computing activities. Its annual Symposium on Applied Computing (SAC) provides an international forum for presentation of the results of strategic research and experimentation for this inter-disciplinary environment. SIGAPP membership fees are: \$15.00 for ACM Non-members, \$15.00 for ACM Professional Members, and \$8.00 for ACM Student Members. For further information on SIGAPP, please contact Tei-Wei Kuo at ktw@csie.ntu.edu.tw or visit the SIGAPP website at <http://www.acm.org/sigapp>.

Track Chairs

Theme: Artificial Intelligence and Agents

AIED - Artificial Intelligence for Education

Danial Hooshyar, Tallinn University, Estonia
Roger Azevedo, University of Central Florida, USA
Mart Laanpere, Tallinn University, Estonia
Raija Hämäläinen, University of Jyväskylä, Finland
Marcelo Milrad, Linnaeus University, Sweden

EC - Applications of Evolutionary Computing

Federico Divina, Pablo de Olavide University, Spain
Francisco Gómez Vela, Universidad Pablo de Olavide de Sevilla, Spain
Miguel Garcia Torres, Universidad Pablo de Olavide, Spain

HIBIO - Health Informatics and Bioinformatics

Anu Mary Chako, National Institute of Technology Calicut, India
Gopakumar G, National Institute of Technology Calicut, India

GMLR – Graph Models for Learning and Recognition

Alessandro D'Amelio, University of Milan, Italy
Jianyi Lin, Università Cattolica del Sacro Cuore, Italy
Raffaella Lanzarotti, University of Milan, Italy
Giuliano Grossi, University of Milan, Italy

IRMAS - Intelligent Robotics and Multi-Agent Systems

Rui Rocha, University of Coimbra, Portugal

ISDE - Intelligent Systems for Digital Era

Tarmo Robal, Tallinn University of Technology, Estonia
Innar Liiv, Tallinn University of Technology, Estonia
Diana Kalibatienė, Vilnius Gediminas Technical University, Lithuania
Raimundas Matulevicius, University of Tartu, Estonia

KNLP - Knowledge and Natural Language Processing

Mauro Dragoni, Fondazione Bruno Kessler, Italy
Marco Rospocher, Università degli Studi di Verona, Italy

MLA - Machine Learning and its Applications
Jee-Hyong Lee, Sungkyunkwan Univ, Republic of Korea
Keon Myung Lee, Chungbuk National University, Republic of Korea

SSRAI – Safe, Secure and Robus AI
Tommaso Zoppi, University of Florence, Italy
Jeremie Guiochet, University of Toulouse, LAAS CNRS, France
Antonio Pecchia, University of Sannio, Italy
Maura Pintor, University of Cagliari, Italy

Theme: Distributed Systems

CC - Cloud Computing
Priya Chandran, National Institute of Technology Calicut, India
S.D Madhu Kumar, National Institute of Technology Calicut, India

DADS - Dependable and Adaptive Distributed Systems
Rui Oliveira, INESC TEC & Univeristy of Minho, Portugal
Karl Goeschka, Vienna University of Technology, Austria
Matti Hiltunen, AT&T, United States

DAPP - Decentralized Applications with Blockchain, DLT and Crypto-Currencies
Jean-Marc Seigneur, University of Geneva, Switzerland
Suzana Moreno, University of Geneva, Switzerland

IE – IoT and Edge Computing
Hong Min, Gachon University, Republic of Korea
Sabur Baidya, University of Louisville, United States

INTOP – Interoperability
Young-Gab Kim, Sejong University, Republic of Korea

NET - Networking
Mario Freire, University of Beira Interior, Portugal
Marilia Curado, University of Coimbra, Portugal
Ivan Ganchev, University of Limerick, Ireland

WCN - Selected Areas of Wireless Communications and Networking
Dongkyun Kim, Kyungpook National University, Republic of Korea
Wei Wang, San Diego State University, United States

DBDM - Databases and Big Data Management

Junping Sun, Nova Southeastern University, United States
Apostolos Papadopoulos, Aristotle University of Thessaloniki, Greece
Ramzi Haraty, Lebanese American University, Lebanon

DS - Data Streams

Albert Bifet, Telecom ParisTech, France
Bruno Veloso, INESC TEC, Portugal
Joao Gama, INESC TEC, University of Porto, Portugal
Heitor Gomes, Victoria University of Wellington, New Zealand

KRR - Knowledge Representation and Reasoning

Stefano Bistarelli, Università di Perugia, Italy
Martine Ceberio, University of Texas El Paso, United States
Eric Monfroy, University of Angers, France
Francesco Santini, Università di Perugia, Italy
Carlo Taticchi, University of Perugia, Italy

SONAMA - Social Network and Media Analysis

Sang-Wook Kim, Hanyang University, Republic of Korea
Yunyong Ko, University of Illinois at Urbana-Champaign, United States

Theme: Software Design & Development

LASD - Lean and Agile Software Development

Adam Przybyłek, Gdańsk University of Technology, Poland

RE - Requirement Engineering

Maria Lencastre Pinheiro de Menezes Cruz, State University of Pernambuco, Portugal

Giovanni Giachetti, Universidad Andres Bello, Chile

SATTA - Software Architecture - Theory, Technology, and Applications

Matteo Camilli, Politecnico di Milano, Italy

Ana Petrovska, Technical University of Munich, Germany

Giovanni Quattrocchi, Politecnico di Milano, Italy

SE - Software Engineering

Eunjee Song, Baylor University, United States

Byungjeong Lee, University of Seoul, Republic of Korea

Geunseok Yang, Hankyong National University, Republic of Korea

SVT - Software Verification and Testing

Georgiana Caltais, University of Twente, The Netherlands

Justyna Petke, University College London, United Kingdom

Peter Lammich, University of Twente, The Netherlands

ST – Semantic Technologies

Sangsoo Sung, Google Inc., United States

Hyoil Han, Illinois State University, United States

Soon Ae Chun, CUNY, United States

WE - Web Engineering

Cristian Mateos, ISISTAN-UNICEN-CONICET, Argentina

Tim A. Majchrzak, University of Agder, Norway

Flavius Frasincaer, Erasmus University Rotterdam, Netherlands

CPS - Cyber-Physical Systems

Mengying Zhao, Shandong University, China

Qiao Li, Xiamen University, China

Jingtong Hu, University of Pittsburgh, United States

Bruno Rossi, Masaryk University, Czech Republic

EMBS - Embedded Systems

Jalil Boukhobza, ENSTA-Bretagne Lab-STICC, France

Marco D. Santambrogio, Politecnico di Milano, Italy

Chien-Chung Ho, National Cheng Kung University, Taiwan

PL – Programming Language

Barrett Bryant, Texas State University, United States

Rajeev Raje, Indiana University-Purdue University-Indianapolis, USA

Marco Giunti, NOVA School of Science and Technology, Portugal

SEC - Computer Security

Diego Sempredoni, Industry, United Kingdom

Giampaolo Bella, Università di Catania, Italy

Ronald Petrlc, TH Nürnberg, Germany

Christoph Sorge, Saarland University, Germany

SP-OS - Software Platform – Operating System

Joonhyouk Jang, Hannam University, Republic of Korea

Jinman Jung, Inha University, Republic of Korea

Bongjae Kim, Chungbuk National University, Republic of Korea

Kwanghee Won, South Dakota State University, United States

Message from the Symposium Chairs

Jiman Hong
Symposium Chair
Soongsil University
Republic of Korea

Fernando de la Prieta Pintado
Symposium Vice-Chair
University of Salamanca
Spain

On behalf of the Organizing Committee, I extend a warm welcome to you at the 39th Annual ACM Symposium on Applied Computing (SAC 2024), taking place in Ávila, Spain, and hosted by the University of Salamanca. For more than three decades, this international forum has been dedicated to computer scientists, engineers, and practitioners, providing a platform for presenting their research findings and results in various areas of applied computing. The organizing committee sincerely appreciates your participation in this exciting international event, and we hope that the conference proves interesting and beneficial for all attendees.

SAC 2024 is proudly sponsored by the ACM Special Interest Group on Applied Computing (SIGAPP), whose mission is to further the interests of computing professionals engaged in the design and development of new computing applications, interdisciplinary application areas, and applied research. This conference is committed to the study of applied computing research addressing real-world problems. Additionally, the event serves as a forum for discussing and exchanging new ideas across a wide spectrum of applied computing areas. We all recognize the importance of staying updated on the latest developments and research in our respective areas of expertise.

SAC 2024 offers Technical Tracks and Poster Sessions, and the success of the conference is attributed to the substantial contributions of dedicated Track Chairs and Co-Chairs. Each track maintains a program committee and a team of highly qualified reviewers. We extend our sincere thanks to the Track Chairs, Co-Chairs, Committee Members, and participating reviewers for their hard work and efforts, which contribute to making SAC 2024 a high-quality conference. Our gratitude also goes to our invited keynote speakers, Dr. Xue (Steve) Liu from McGill University, Canada, and Dr. Paulo Novais from University of Minho, Portugal.

Most importantly, we express our deep gratitude to the authors and presenters for sharing their experiences, and to all attendees for joining us in Ávila, Spain, this year.

The organizing committee has played a crucial role in the success of SAC 2024. Our appreciation goes to the Local Arrangement Chair, Dr. Sara Rodriguez Gonzalez, University of Salamanca, Salamanca, Spain. We extend sincere appreciation to the Publication Chair, Dr. Hossain Shahriar, University of West Florida, Florida, USA, for his tremendous effort in compiling the conference proceedings. Special thanks to the Posters Chair, Dr. Marin Lujak Rey Juan Carlos University, Madrid, Spain, for his hard work in creating a successful Poster Program, and to the Tutorial Chair, Dr. Ana Belén Gil, University of Salamanca, Salamanca, Spain, for organizing the Tutorials. Additionally, we acknowledge Dr. John Kim, Utica University, New York, USA, for organizing the Student Research Competition and serving as treasurer, and Dr. Junyoung Heo, Hansung University, Seoul, South Korea, for the role of registration chair and webmaster.

We also express our gratitude to the Program Co-Chairs, Dr. Juw Won Park, University of Louisville, Kentucky, USA, and Dr. Adam Przybyłek, Gdańsk University of Technology, Gdańsk, Poland, for coordinating and bringing together an excellent Technical Program.

Once again, we welcome you to SAC 2024, and we hope you thoroughly enjoy the conference. Looking ahead, we invite you to participate in SAC 2025, which will be held in Sicily, Italy.

Message from the Program Chairs

Juw Won Park
University of Louisville
USA

Adam Przybyłek
Gdańsk University of Technology
Poland

Welcome to the 39th International Symposium on Applied Computing (SAC 2024). For the past 39 years, SAC has become a major international venue for computing researchers and applied practitioners to convene and share ideas on recent developments in a variety of applied areas of information technology. The success of SAC has been the consolidation of a wide range of applied areas into specialized modules called Tracks. Each of the Tracks is then organized and administered by experts in the respective areas by instituting program committees, carrying out blind reviews according to the ACM guidelines, and finally selecting the highly qualified papers for the Track. Since its inception nine years ago, the Poster Sessions at SAC have become a tradition, and this year again the Poster will be an integral part of the Technical Program at SAC 2024.

The open Call for Track Proposals and after prescreening the proposals, 34 Tracks were finally accepted for SAC 2024. The prescreening and selections were made based on the success of those Tracks in the previous SACs as well as targeting new and emerging areas. The Call for Papers for these Tracks attracted 773 final paper submissions from over 40 different countries. The submitted papers underwent the blind review process and 180 submissions were finally accepted as full papers for inclusion in the Conference Proceedings and presentation during the Symposium. The final acceptance rate for SAC 2024 is (23.3%) for the overall track. In addition to the accepted full papers, 71 submissions that received high enough review scores were accepted as poster papers for the Posters program. The Student Research Competition (SRC) program is designed to provide graduate students the opportunity to meet and exchange ideas with researchers and practitioners in their areas of interest. 36 submissions received and finally 7 (19%) papers were accepted for the SRC program.

The Technical Program of SAC 2024 is made possible through the hard work of many people from the scientific community who have volunteered and committed many hours to make it a success. Much credit goes to all Track Chairs for making SAC 2024 Technical Sessions a huge success. Some of the popular Tracks had an unprecedented submissions and having three blind reviews for each paper was certainly a major challenge. Once again this year, we follow the previous years' tradition in organizing various tracks into five different themes. The Symposium Proceedings and the technical presentations are focused around these themes to form a series of related track sessions. On behalf of the entire SAC 2024 Organizing Committee, we congratulate all the authors for having their papers accepted in their respective Tracks, and we wish to thank all of those who made this year's technical program a great success. Specifically, we wish to thank the speakers, posters chair, track chairs, reviewers, technical program committee members, session chairs, presenters, and all the attendees. We also wish to convey our special thanks to the local organizing committee lead by University of Salamanca, Spain. We wish you have a great time at Avila, Spain in SAC 2024, and you will have the opportunity to share and exchange your ideas and foster new collaborations. We hope to see you all at SAC 2025.

SAC 2024 Keynote

Title: Bridging the Gap: My Experiences in Academia and Industry as an Applied Computing Researcher

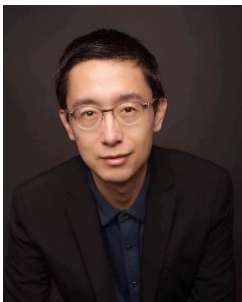
Speaker: Dr. Xue (Steve) Liu, School of Computer Science, McGill University, Canada

Abstract

Applied computing research holds immense importance in computer science because it bridges theory and practical applications. It translates cutting-edge computing technologies into tangible solutions that address real-world challenges. In this talk, I will share my experience and lessons learned as an applied computing researcher who has worked in both academia and industry. I will embark on a personal journey - from my decision to transition from a mathematics student to a Ph.D. in computer science, followed by becoming a university professor, and then venture into the dynamic landscapes of startups, entrepreneurship, and corporate R&D, exploring diverse areas including computing systems, networking, and AI/machine learning.

Beyond sharing my experiences, I will discuss the core differences between academic research and industry research, and their pros and cons. Finally, I'll argue why closer collaboration between academia and industry is crucial for the future success of computing, and discuss actionable ways to carry out the collaboration.

Biography



Dr. Xue (Steve) Liu is a Full Professor in the School of Computer Science and a William Dawson Chair Professor at McGill University. He is also a Professor (Courtesy Appointment) of Mathematics and Statistics at McGill University. He served as VP R&D, Chief Scientist, and Co-Director of the Samsung AI Center Montreal, where he led the R&D of AI innovations in multiple areas including telecommunications, mobile computing, IoT, and robotics. He was also the Chief Scientist at Tinder Inc., leading the research and innovation for the world's largest dating and social discovery app valued at over 10 Billion US\$. He also worked briefly as the Samuel R. Thompson Chair Associate Professor in the Department of Computer Science and Engineering at The University of Nebraska-Lincoln, at Hewlett-Packard Labs in Palo Alto, California, and IBM T. J. Watson Research Center in New York.

Dr. Liu is an IEEE Fellow, and a Fellow of the Canadian Academy of Engineering. He is an associate member at the Quebec AI Institute (Mila). His research interests focus on Intelligent Computing and Communications Systems, AI/Machine Learning, Sustainable Computing, IoT and CPS. He has published 5 books and over 400 research papers in major peer-reviewed international journals and conference proceedings, and received 10 best paper awards from IEEE or ACM. He has served as the associate editor/advisor of several international academic journals and has served on the technical and organization committees of over 100 international conferences/workshops. He is a recipient of several awards including the Mitacs Award for Exceptional Leadership — Professor, and the Outstanding Young Canadian Computer Science Researcher Prizes from the Canadian Association of Computer Science. He is the current chair of ACM SIGBED. Dr. Liu has advised several high-tech startups. These startups have raised over 250 million US\$ in funding.

SAC 2024 Keynote

Title: Empowering human intelligence with AI integration: Creating more intelligent, intuitive, and understandable systems

Speaker: Dr. Paulo Novais, School of Informatics, University of Minho, Portugal

Abstract

The importance of Artificial Intelligence today, which goes far beyond the limits of “simple” technology, and the need to humanise its application and use in accordance with ecological and ethical principles, serve as the basis for this discussion.

The challenges that lie ahead are enormous and include the development of systems that are necessarily more intelligent, but that meet the requirements of transparency and explainability (as far as possible), and that are fundamentally sensitive to the human presence, with the strictest respect for human values and dignity.

I'd like to present some of the projects I've been involved in that are a step in this direction.

The ability to change the world is in our hands, but we must use it wisely.

Biography



Dr. Paulo Novais is a Full Professor of Computer Science at the Department of Informatics, the School of Engineering, the University of Minho (Portugal), and a researcher at the ALGORITMI Centre.

He is the director of the PhD Program in Informatics and co-founder and Deputy Director of the Master in Law and Informatics at the University of Minho.

He started his career developing scientific research in the field of Intelligent Systems/Artificial Intelligence (AI), namely in Knowledge Representation and Reasoning, Machine Learning and Multi-Agent Systems. His interest, in the last years, was absorbed by the different, yet closely related, concepts of Ambient Intelligence, Decision, Conflict Resolution, Behavioural Analysis, Digital Assistants and the incorporation of AI methods and techniques in these fields.

His main research objective is to make systems a little more smart, reliable, and sensitive to human presence and interaction.

He is the coordinator of the Portuguese Intelligent Systems Associate Laboratory (LASI).

Former president of the Portuguese Association for Artificial Intelligence, Senior member of the IEEE and Chair of the Computational Intelligence Society Portuguese Chapter, Member of the IFIP - TC 12 Artificial Intelligence, and of the executive committee of the IBERAMIA.

He has served as an expert of several institutions such as the EU Commission and FCT (Portuguese agency that supports science, technology, and innovation).

Other Activities

SIGAPP Annual Business Meeting:

Wednesday April 10, from 17:30 to 19:00 (Location: TBD). Open to everyone.

Future SAC Organization Meeting:

Tuesday April 9, from 18:00 to 19:00 (Location: TBD). Open to everyone.

SIGAPP Reception:

Tuesday April 9, from 19:30 to 21:30 (Location: Congress Hall). Open to everyone.

Track Chairs Meeting:

Thursday, April 11, from 18:00 to 19:00 (Location: TBD). Open for the Organizing Committee and Track Chairs.

SAC Banquet:

Thursday, April 11, from 20:00 to 23:00 (Location: Hotel Palacio de los Velada). Open for Banquet Ticket holders. See your tickets for full details.

SAC Best Papers/Best Posters Award:

Thursday, April 11. During the SAC Banquet, Program Chairs and Posters Chairs will award one best paper for each of the five themes and best posters of this conference.

SRC Program:

The Student Research Competition program includes Poster Display on Tuesday from 16:00 to 18:00 (Location: Hallway) and Oral Presentations on Thursday 16:00 to 18:00 (Location: Room Mirador). Medals and certificates will be given to the top three winners during the SAC Banquet.

SIGAPP Wrap-up Meeting:

Friday April 12, from 10:00 to 12:00 (Location: TBD). Open to everyone.

Monday April 08, 2024

Mon 14:30 – 18:30
Rooms: TBA
Tutorials
See tutorial pages for more details

Tuesday April 09, 2024

TUE 9:30–11:00
Room: Chamber Hall
Keynote Address
Dr. Steve X. Liu
See page 15 for details.

TUE 11:00 – 11:30
Coffee Break

TUE 11:30 – 13:00
Room: 1
(DAPP) Decentralized Applications
with Blockchain, DLT and
Crypto-Currencies Track
Session Chair: Jean-Marc Seigneur

**ACCOUNT DISCOVERY: IDENTIFYING WEB3 SNS
ACCOUNTS AT RISK OF DE-ANONYMIZATION**
Daiki Ito, Yuta Takata, Keika Mori, Ryoya Furukawa,
Hiroshi Kumagai and Masaki Kamizono

**ELECTRICITY CONSUMPTION OF ETHEREUM
AND FILECOIN: ADVANCES IN MODELS AND
ESTIMATES**
Elitsa Pankovska, Ashish Rajendra Sai, Harald Vranken and
Alan Ransil

**UNSEALING THE SECRETS OF BLOCKCHAIN
CONSENSUS: A SYSTEMATIC COMPARISON OF
THE FORMAL SECURITY OF PROOF-OF-WORK
AND PROOF-OF-STAKE**
Iván Abellán Álvarez, Vincent Gramlich and Johannes
Sedlmeir

**A STUDY OF MEV EXTRACTION TECHNIQUES
ON A FIRST-COME-FIRST-SERVED BLOCKCHAIN**
Burak Öz, Filip Rezac, Jonas Gebele, Felix Hoops and
Florian Matthes

TUE 11:30 – 13:00

Room: 2

(ISDE) Intelligent Systems for Digital Era
Session Chair: Tarmo Robal

**TOWARDS A LABELING METHOD FOR
EDUCATION PROCESS MINING AND A CASE
STUDY ON HIGHER EDUCATION**

Luiz Fernando Puttow Southier, Marcelo Teixeira,
Dalcimar Casanova and Edson Emilio Scalabrin

**PETRI NETS FOR SMART GRIDS:
THE STORY SO FAR**

Mouzhi Ge, Bruno Rossi, Stanislav Chren and
José Miguel Blanco

**EVALUATING TRUSTWORTHINESS OF ONLINE
NEWS PUBLISHERS VIA ARTICLE
CLASSIFICATION**

John Bianchi, Manuel Pratelli, Marinella Petrocchi and
Fabio Pinelli

**ON THE RELEVANCE OF VALUE SYSTEM
STRUCTURE FOR AUTOMATED VALUE-
ALIGNED DECISION-MAKING**

Marcelo Karanik, Holger Billhardt, Alberto Fernandez and
Sascha Ossowski

**FROM SELF-SOVEREIGN IDENTITY TO
FIDUCIARY IDENTITY: A JOURNEY TOWARDS
GREATER USER PRIVACY AND USABILITY**

Frederico Schardong and Ricardo Custodio

TUE 11:30 – 13:00

Room: 3

(KNLP) Knowledge and Natural
Language Processing Track
Session Chair: Marco Rospocher

**EMOSUM: CONVERSATION SUMMARIZATION
WITH EMOTIONAL CONSISTENCY**

YOUNGJIN JO and JinYeong Bak

**COSMO: A MULTILINGUAL MODULAR
LANGUAGE FOR CONTENT SELECTION
MODELLING**

Kutz Arrieta, Pablo R Fillottrani and C. Maria Keet

**CAUSAL-EVIDENCE GRAPH FOR CAUSAL
RELATION CLASSIFICATION**

Yuni Susanti and Kanji Uchino Vavassori Benitti

**WIKI-BASED PROMPTS FOR ENHANCING
RELATION EXTRACTION USING LANGUAGE
MODELS**

Amirhossein Layegh, Amir H. Payberah, Mihhail
Matskin, Ahmet Soylu and Dumitru Roman

TUE 11:30 – 13:00

Room: Press Room

(AIED-1) Artificial Intelligence for Education
Session Chair: Danial Hooshyar

**TOWARD SCALABLE AND TRANSPARENT
MULTIMODAL ANALYTICS TO STUDY
STANDARD MEDICAL PROCEDURES:
LINKING HAND MOVEMENT, PROXIMITY,
AND GAZE DATA**

Ville Heilala, Sami Lehesvuori, Raija Hämäläinen and
Tommi Kärkkäinen

**EFFECTIVENESS OF LIGHTWEIGHT
AUTOMATED SUPPORT FOR LEARNING ABOUT
DYNAMIC SYSTEMS WITH QUALITATIVE
REPRESENTATIONS**

Marco Kragten and Bert Bredeweg

**DECODING THE NATURALLY ARISEN
LEADERSHIP IN COLLABORATIVE LEARNING:
A BAYESIAN SIMULATION AND HUMAN
NETWORK STUDY**

Zheng Fang, Jae Young Han, Ahmad Ari Aldino, Zhijie
Feng and Toby Cai

**SIG-NET: GNN BASED DROPOUT PREDICTION
IN MOOCS USING STUDENT
INTERACTION GRAPH**

Daeyoung Roh, donghee han, Daehee Kim,
Keejun Han and Mun Yi

**EXPLORING THE EFFECTIVENESS OF
READING VS. TUTORING FOR ENHANCING
CODE COMPREHENSION FOR NOVICE**

Priti Oli, Rabin Banjade, Arun Balajee Lekshmi
Narayanan, Peter Brusilovsky and Vasile Rus

TUE 11:30 – 13:00

Room: Mirador

(SATTA) Software Architecture-Theory,
Technology, and Applications Track
Session Chair: Matteo Camilli

**SOFTWARE ARCHITECTURE RECOVERY
FROM MULTIPLE DEPENDENCY MODE**

Metin Altinisik, Hasan Sozer and Gonca Gursun

**ML-ENABLED SERVICE DISCOVERY FOR
MICROSERVICE ARCHITECTURE:
A QOS APPROACH**

Stefano Florio, Karthik Vaidhyanathan, Mauro Caporuscio
and Henry Muccini

**COMPARING THE SIMILARITY OF OPENAPI-
BASED MICROSERVICES**

Zhongyi Lu, Declan T Delaney and David Lillis

**VAMP: VISUAL ANALYTICS FOR
MICROSERVICES PERFORMANCE**

Luca Traini, Jessica Leone, Giovanni Stilo and
Antiniscia Di Marco

Tue 13:00 – 14:30

Lunch Break

(Congress Hall)

TUE 14:30 – 16:00

Room: 1

(CC) Cloud Computing Track
Session Chairs: Priya Chandran and SD Madhu Kumar

**DISJUNCTIVE MULTI-LEVEL DIGITAL
FORGETTING SCHEME**

Marwan Darwish and Georgios Smaragdakis

**DECENTRALIZED FAAS OVER MULTI-CLOUDS
WITH BLOCKCHAIN BASED MANAGEMENT
FOR SUPPORTING EMERGING APPLICATIONS**

Rabimba Karanjai, Lei Xu, Lin Chen, Nour Diallo and
Weidong Shi

**FUNCMEM: REDUCING COLD START LATENCY
IN SERVERLESS COMPUTING THROUGH
MEMORY PREDICTION AND ADAPTIVE
TASK EXECUTION**

Manish Pandey and Young-Woo Kwon

TUE 14:30 – 16:00

Room: 2

(HIBIO) Health Informatics and
Bioinformatics Track
Session Chairs: Anu Chacko and Gopakumar G

**PRIOR-BASED ENHANCED ASD-POCS FOR
ARTIFACT SUPPRESSION AND STRUCTURAL
PRESERVATION IN SPARSE-VIEW CBCT**

D M BAPPY, Donghwa Kang, Jinkyu Lee and
Hyeongboo Baek

**APPLYING DYNAMIC BALANCING TO
IMPROVE THE PERFORMANCE OF MPI
PARALLEL GENOMICS APPLICATIONS**

Alejandro Fernandez-Fraga, Jorge Gonzalez-Dominguez
and Maria J. Martín

**A NOVEL HIERARCHY-BASED KNOWLEDGE
DISCOVERY FRAMEWORK FOR ELUCIDATING
HUMAN AGING-RELATED PHENOTYPIC
ABNORMALITIES**

Cen Wan and Carl Barton Jhaveri

**KNOWLEDGE SYNTHESIS USING LARGE
LANGUAGE MODELS FOR A COMPUTATIONAL
BIOLOGY WORKFLOW ECOSYSTEM**

Hasan Jamil, Steve Krawetz and Alexander Gow

TUE 14:30 – 16:00

Room: 3

(CPS-1) Cyber-Physical Systems Track
Session Chair: Yi-Syuan Lin

**HARDWARE AND SOFTWARE GENERATION
FROM LARGE ACTOR MACHINES IN
STREAMING APPLICATIONS**

Gareth Callanan and Flavius Gruian

SATELLITE IMAGERY-ASSISTED LINK-BUDGET ANALYSIS ALGORITHM FOR SMART GRID WIRELESS BACKHAUL NETWORK PLANNING

Marina L. S. C. Vieira, Marina de Lara, Marcelo Pellenz, Mauricio Biczkowski, Marcos Alberto Mochinski, Fabrício Enembreck, Edgard Jamhour and Voldi Costa Zambenedetti

MOT-AS: REAL-TIME SCHEDULING FRAMEWORK FOR MULTI-OBJECT TRACKING CAPTURING ACCURACY AND STABILITY

Donghwa Kang, Kilho Lee, Cheol-Ho Hong, Youngmoon Lee, Jinkyu Lee and Hyeongbo Baek

BINARY FOLDING COMPRESSION FOR EFFICIENT SOFTWARE DISTRIBUTION

Jinheng LI, Qiao Li, Hu Wan and Jason Xue

TUE 14:30 – 16:00
Room: Press Room

(AIED-2) Artificial Intelligence for Education
Session Chair: Danial Hooshyar

THE TEMPORAL DYNAMICS OF PROCRASTINATION AND ITS IMPACT ON ACADEMIC PERFORMANCE: THE CASE OF A TASK-ORIENTED PROGRAMMING COURSE

Javier Conde, Sonsoles López-Pernas, Enrique Barra and Mohammed Saqr

ON THE RELATION OF CAUSALITY- VERSUS CORRELATION-BASED FEATURE SELECTION ON MODEL FAIRNESS

Mirka Saarela

CHATGPT AS A MATH QUESTIONER? EVALUATING CHATGPT ON GENERATING PRE-UNIVERSITY MATH QUESTIONS

Phuoc Pham, Anh Vu, Nhat Hoang, Xuan Long Do and Anh Tuan Luu

GENERATIVE AI-ENHANCED ACADEMIC WRITING: A STAKEHOLDER-CENTRIC APPROACH FOR THE DESIGN AND DEVELOPMENT OF CHAT4ISP-AI

Mohammed Taiye, Christopher High, Johanna Velandar, Khaled Matar, Rihards Okmanis and Marcelo Milrad

CONTEXTUAL EMBEDDINGS AND GRAPH CONVOLUTIONAL NETWORKS FOR CONCEPT PREREQUISITE LEARNING

Jean-Charles Layoun, Amal Zouaq and Michel Desmarais

TUE 14:30 – 16:00
Room: Mirador

(WE) Web Engineering Track
Session Chair: Marc Oriol Hilari

UX-ANALYZER: VISUALIZING THE INTERACTION EFFORT FOR WEB ANALYTICS

Juan Gardey, Julián Grigera, Andrés Rodríguez and Alejandra Garrido

ASYNCSLA: TOWARDS A SERVICE LEVEL AGREEMENT FOR ASYNCHRONOUS SERVICES

Marc Oriol, Abel Gómez and Jordi Cabot

ELYSIA: OPTIMIZING JAVASCRIPT WEB FRAMEWORK

Chayapatr Archiwaranguprok, Kongkeit Khunpanitchot, Poomparin Mano and Manachai Toahchoodee

TUE 16:00 – 16:30
Coffee Break

TUE 16:00 – 18:00
SRC Poster Exhibit

TUE 16:30 – 18:00
Room: 1

(DADS) Dependable, Adaptive, and Secure Distributed Systems
Session Chair: Karl M. Göschka

DYNAMIC OPTIMIZATION OF THE LATENCY THROUGHPUT TRADE-OFF IN PARALLEL CHAIN DISTRIBUTED LEDGERS

Pedro Campones and Henrique Domingos

ENABLING ADAPTATION IN DYNAMIC MANUFACTURING ENVIRONMENTS WITH DECENTRALIZED AGENT-BASED SYSTEMS AND LOCAL PERCEPTION

Sebastian Schmid and Andreas Harth

**FORTRESS: SECURING IOT PERIPHERALS
WITH TRUSTED EXECUTION ENVIRONMENTS**

Peterson Yuhala, James Menetrey, Pascal Felber,
Marcelo Pasin and Valerio Schiavoni

**SOLVABILITY OF BYZANTINE FAULT-
TOLERANT CAUSAL ORDERING:
SYNCHRONOUS SYSTEMS CASE**

Anshuman Misra and Ajay Kshemkalyani

**TUE 16:30 – 18:00
Room: 2**

(IRMAS) Intelligent Robotics and
Multi-Agent Systems
Session Chair: Rui P. Rocha

**TRUSTFUL COOPETITIVE INFRASTRUCTURES
FOR THE NEW SPACE EXPLORATION ERA**

Renan Lima Baima, Loïck Chovet, Eduard Hartwich,
Abhishek Bera, Johannes Sedlmeir, Gilbert Fridgen and
Miguel Angel Olivares-Mendez

**ATTENTION FOR THE ALLOCATION OF TASKS
IN MULTI-AGENT PICKUP AND DELIVERY**

Adria Fenoy, Jacopo Zagoli, Filippo Bistaffa and
Alessandro Farinelli

**COLLECTIVE ANOMALY PERCEPTION DURING
MULTI-ROBOT PATROL: CONSTRAINED
INTERACTIONS CAN PROMOTE
ACCURATE CONSENSUS**

Zachary Madin, Jonathan Lawry and Edmund R Hunt

**GRAPH LEARNING-BASED FLEET
SCHEDULING FOR URBAN AIR MOBILITY
UNDER OPERATIONAL CONSTRAINTS,
VARYING DEMAND & UNCERTAINTIES**

Steve Paul, Jhoel Witter and Souma Chowdhury

**TUE 16:30 – 18:00
Room: 3**

(CPS-2) Cyber-Physical Systems Track
Session Chair: Hu Wan

SATPRINT: SATELLITE LINK FINGERPRINTING

Gabriele Oligeri, Savio Sciancalepore and
Alireza Sadighian

**TEMPORAL LOGIC FORMALISATION OF
ISO 34502 CRITICAL SCENARIOS:
MODULAR CONSTRUCTION WITH
THE RSS SAFETY DISTANCE**

Jesse Reimann, Nico Mansion, James Haydon,
Benjamin Bray, Agnishom Chattopadhyay, Sota Sato,
Masaki Waga, Étienne André, Ichiro Hasuo,
Naoki Ueda and Yosuke Yokoyama

**BRIDGING DNA STORAGE AND
COMPUTATION: AN INTEGRATED
FRAMEWORK FOR EFFICIENT
BIOMOLECULAR DATA MANAGEMENT**

Yi-Syuan Lin, Yu-Pei Liang, Yuan-Hao Chang,
Wei-Kuan Shih and Wen Sheng Lim

**INTELLIGENT COEXISTENCE OF HYBRID VLC-
RF AND WI-FI FOR INDOOR WIRELESS CYBER-
PHYSICAL SYSTEMS**

Yuhan Su, Yuchen Lin, Sicong Liu, Minghui Liwang,
Xinqin Liao, Tingzhu Wu and Zhong Chen

**TUE 16:30 – 18:00
Room: Press Room**

(GMLR) Graph Models for
Learning and Recognition
Session Chair: Giuseppe Facchi

**INFORMED HETEROGENEOUS ATTENTION
NETWORKS FOR METAPATH BASED
LEARNING**

Lorenz Wendlinger and Michael Granitzer

**CHANGE POINT DETECTION IN EVOLVING
GRAPH USING MARTINGALE**

Shen-Shyang Ho and Tarun Teja Kairamkonda

**BEYOND THE ADDITIVE NODES'
CONVOLUTIONS: A STUDY ON HIGH-ORDER
MULTIPLICATIVE INTEGRATION**

Paolo Frazzetto, Luca Pasa, Nicolò Navarin and
Alessandro Sperduti

**GENDER CLASSIFICATION VIA GRAPH
CONVOLUTIONAL NETWORKS ON 3D FACIAL
MODELS**

Giorgio Blandano, Jacopo Burger, Annalisa Cappella,
Claudia Dolci, Giuseppe Maurizio Facchi, Federico
Pedersini, Chiarella Sforza and Gianluca M. Tartaglia

TUE 16:30 – 18:00
Room: Mirador

(EC) Applications of
Evolutionary Computing
Session Chair: David Gutiérrez Avilés

**A GENETIC ALGORITHM-BASED AUTO-ML
SYSTEM FOR SURVIVAL ANALYSIS**
Tossapol Pomsuwan and Alex A. Freitas

**AN ADAPTIVE BIASED RANDOM-KEY GENETIC
ALGORITHM FOR THE TACTICAL BERTH
ALLOCATION PROBLEM**
Antonio Chaves, Jose F Goncalves, Rudinei M Oliveira
and Luiz A Lorena

**AN EVOLUTIONARY TRICLUSTERING
APPROACH TO DISCOVER ELECTRICITY
CONSUMPTION PATTERNS IN FRANCE**
David Gutiérrez-Avilés, José F. Torres,
Francisco Martínez-Álvarez and Jairo Cugliari

TUE 18:00 – 19:00
**Future SAC Organization
Meeting**

TUE 19:30 – 21:30
SIGAPP Reception
Room: Congress Hall

Wednesday April 10, 2024

WED 9:30 – 11:00
Room: 1

(SSRAI-1) Safe, Secure, and
Robust AI Track
Session Chair: Tommaso Zoppi

**DATA POISONING DETECTION IN
FEDERATED LEARNING**
Denise-Phi Khuu, Michael Sober, Dominik Kaaser,
Mathias Fischer and Stefan Schulte

**VALIDATION OF SAFETY METRICS FOR
OBJECT DETECTORS IN AUTONOMOUS
DRIVING**
Andreas Rønnestad, Andrea Ceccarelli and
Leonardo Montecchi

**CAN YOU TRUST YOUR AGENT? THE EFFECT
OF OUT-OF-DISTRIBUTION DETECTION ON
THE SAFETY OF REINFORCEMENT
LEARNING SYSTEMS**
Tom Haider, Karsten Roscher, Benjamin Herd,
Felippe Schmoeller Roza and Simon Burton

**CAN YOU TRUST YOUR ML METRICS? USING
SUBJECTIVE LOGIC TO DETERMINE THE TRUE
CONTRIBUTION OF ML METRICS FOR SAFETY**
Benjamin Herd and Simon Burton

WED 9:30 – 11:00
Room: 2

(RE) Requirement Engineering Track
Session Chair: Maria Lencastre

**AN EMPIRICAL STUDY OF THE IMPACT OF
WATERFALL AND AGILE METHODS ON
NUMBERS OF REQUIREMENTS-RELATED
DEFECTS**
Anzira Rahman, Luiz Marcio Cysneiros and Daniel Berry

**HOW FACIAL RECOGNITION TECHNOLOGIES
AFFECT THE TRANSGENDER COMMUNITY?
A SYSTEMATIC MAPPING STUDY**
Michel Silva and George Valenca

A CATALOG OF NON-FUNCTIONAL REQUIREMENTS AND PATTERNS FOR MICROSERVICES MIGRATION

Marcio Veronez, Ivonei Freitas da Silva, Victor Francisco Araya Santander and Elder Elisandro Schemberger

A VIEW OF THE TECHNICAL, INDIVIDUAL, AND SOCIAL DIMENSIONS OF SUSTAINABLE SOFTWARE SYSTEMS: A SYSTEMATIC LITERATURE REVIEW

Quelita Ribeiro, Abimael Santos, Karolyne Oliveira, JAELSON CASTRO and Maria Lencastre Pinheiro de Menezes Cruz

WED 9:30 – 11:00

Room: 3

(EMBS) Embedded Systems Track
Session Chairs: Chien-Chung Ho and Chia-Heng Tu

AVOIDING EMPTY INSTANCES AND OFFSET DRIFTS OF BASIC SEQUENCER TASKS IN AUTOMOTIVE OPERATING SYSTEM

MuhammadTanveer AliAhmad, Michael Krisper, Leandro Batista Ribeiro and Marcel Baunach

TRAFFIC SIGNAL PREEMPTION AND PRIORITIZATION FOR HIGH-DENSITY ROAD NETWORKS

Chun Ting Wu, Yung-jen Hsu, Chia-Heng Tu and ShaoHua Wang

ON ENHANCING DATA INTEGRITY WITH LOW-COST RETENTION-REFILLABLE PROGRAMMING SCHEME

Kun-Chi Chiang, Yung-Chun Li, Wei-Chen Wang and Wei-Kuan Shih

PIGMMALION: A PARTIAL INCREMENTAL GAUSSIAN MIXTURE MODEL WITH A LOW I/O DESIGN

Meriem Bouzouad, Yasmine Benhamadi, Camelia Slimani and Jalil Boukhobza

FAIR AND STARVATION-FREE SPINLOCK FOR REAL-TIME AUTOSAR SYSTEMS

Drona Nagarajan, Tobias Scheipel and Marcel Baunach

WED 9:30 – 11:00

Room: Mirador

(INTOP) Interoperability Track
Session Chair: Young-Gab Kim

INTEGRATED INTEROPERABILITY BASED PANORAMIC VIDEO SYNOPSIS FRAMEWORK

Palash Ingle and Young-Gab Kim

LINK : SELF-ADAPTIVE SYSTEM WITH HUMAN-MACHINE TEAMING-BASED LOOP FOR INTEROPERABILITY IN IOT ENVIRONMENT

Hongseok Oh, Kyungchang Jeong, Euijong Lee and Ji-Hoon Jeong

RECKG: KNOWLEDGE GRAPH FOR RECOMMENDER SYSTEMS

Junhyuk Kwon, Seokho Ahn and Young-Duk Seo

WED 9:30 – 11:00

Room: Press Room

(SONAMA) Social Network and Media Analysis Track
Session Chairs: Sang-Wook Kim and Yunyong Ko

ARE K-CORES MEANINGFUL FOR TEMPORAL GRAPH ANALYSIS?

Alessio Conte and Davide Rucci

A LARGE LANGUAGE MODEL APPROACH TO DETECT HATE SPEECH IN POLITICAL DISCOURSE USING MULTIPLE LANGUAGE CORPORA

Aillkeen de Oliveira, Cláudio de Souza Baptista, Anderson Almeida Firmino and Anselmo Cardoso de Paiva

ALL POLARIZED BUT STILL DIFFERENT: A MULTI-FACTORIAL METRIC TO DISCRIMINATE BETWEEN POLARIZATION BEHAVIORS ON SOCIAL MEDIA

Celina Treuillier, Sylvain Castagnos and Armelle Brun

COOPERATIVE EMBEDDING - A NOVEL APPROACH TO TACKLE THE OUT-OF-VOCABULARY DILEMMA IN BOT

AKHILA VH and Dr. Anu Mary Chacko

WED 11:00 – 11:30

Coffee Break

WED 11:00 – 13:00

AM Poster Session

Posters of the following Tracks: *AIED, EC, EMBS, GMLR, IRMAS, ISDE, MLA*

(See page 23 for detailed list of Posters)

WED 11:30 – 13:00

Room: 1

(SSRAI-2) Safe, Secure, and Robust AI Track

Session Chair: Tommaso Zoppi

**MULTI-CONFEDERATED LEARNING:
INCLUSIVE NON-IID DATA HANDLING WITH
DECENTRALIZED FEDERATED LEARNING**

Michael Duchesne, Kaiwen Zhang and Talhi Chamseddine

**UNDERSTANDING THE PROCESS OF DATA
LABELING IN CYBERSECURITY**

Tobias Braun, Irdin Pekaric and Giovanni Apruzzese

**DECEPTIVE SKIES: LEVERAGING GANS FOR
DRONE SENSOR DATA FALSIFICATION**

Mehmed Uludag, Maryna Veksler, Yasin Yilmaz and Kemal Akkaya

WED 11:30 – 13:00

Room: 2

(ST) Semantic Technologies Track

Session Chair: Hyoil Han

**KNOWLEDGE BASE GROUNDED PRE-TRAIN
ED LANGUAGE MODELS VIA DISTILLATION**

Raphael Sourty, Jose G. Moreno, François-Paul Servant and Lynda Tamine

**TRACING THE IMPACT OF BIAS IN LINK
PREDICTION**

Mayra Russo, Sammy Fabian Sawischa and Maria-Esther Vidal

**PROCESS KNOWLEDGE EXTRACTION AND
KNOWLEDGE GRAPH CONSTRUCTION
THROUGH PROMPTING: A QUANTITATIVE
ANALYSIS**

Patrizio Bellan, Mauro Dragoni and Chiara Ghidini

**EFFICIENT KEY-BASED DATA LINKING
THROUGH KEY TRANSFER BETWEEN
KNOWLEDGE GRAPHS**

Thibaut SOULARD, Fatiha Saïb, Joe Raad and Gianluca Quercini

**AN EXPERIMENT IN RETROFITTING
COMPETENCY QUESTIONS FOR
EXISTING ONTOLOGIES**

Reham Alharbi, Valentina Tamma, Floriana Grasso and Terry Payne

WED 11:30 – 13:00

Room: 3

(SP-OP) Software Platform – Operating System Track

Session Chairs: Jinman Jung and Joonhyouk Jang

**TOWARDS OPTIMIZATIONS OF QUANTUM
CIRCUIT SIMULATION FOR SOLVING MAX-CUT
PROBLEMS WITH QAOA**

Yu-Cheng Lin, Chuan-Chi wang, Chia-Heng Tu and Shih-Hao Hung

**OPTIMIZING READ PERFORMANCE OF HBASE
THROUGH DYNAMIC CONTROL OF DATA
BLOCK SIZES AND KVCACHE**

Sangeun Chae, Wonbae Kim, Daegyung Han, Jeongmin Kim and Beomseok Nam

**HIGH ENERGY EFFICIENCY MOBILE AR
APPLICATIONS UNDER ADAPTIVE OBJECT
DETECTION ENGINE AND SELF-LEARNING
GOVERNOR**

He-Ru Chen, Kun-Sheng Liu, Ya-Shu Chen and Hsiu-Yi Ou Yang

**KNOWLEDGE SHARING BASED LIGHTWEIGHT
TRANSFORMER FOR CONSTRUCTION SAFETY
ACCIDENT PREVENTION**

Namgyu Jung, Saebom Lee and Chang Choi Chen

**VULNHUNT-GPT: A SMART CONTRACT
VULNERABILITIES DETECTOR BASED ON
OPENAI CHATGPT**

Biagio Boi, Christian Esposito and Sokjoon Lee

**GPU MEMORY REALLOCATION TECHNIQUES
IN FULLY HOMOMORPHIC ENCRYPTION
WORKLOADS**

Jake Choi, Sunchul Jung and Heonyoung Yeom

WED 11:30 – 13:00

Room: Mirador

(WCN) Selected Areas of Wireless
Communications and Networking Track
Session Chairs: Dongkyun Kim and Wei Wang

**DYNAMIC BACKHAUL CLUSTERING FOR
ENHANCED SCALABILITY IN CELL-FREE
MASSIVE MIMO NETWORKS**

Mahnoor Ajmal, Ayesha Siddiq, Muhammad Ashar Tariq,
Malik Muhammad Saad and Dongkyun Kim

**EFFICIENT TIME SLOT RECOVERY PROTOCOL
FOR WIRELESS NETWORKS**

Hicham Lakhlef, Khaled Abid, Ghada Jaber and Fabio
D'andreagiovanni

**EXPLORING ARCHITECTURAL STRATEGIES
FOR MOBILITY EXPERIMENTATION: A
SIMULATION-BASED STUDY**

Victoria Botelho Martins, Douglas Macedo and Laercio
Pioli Junior

**OPTIMIZATION BASED ON DISTRIBUTED
INTELLIGENT NETWORK SOFTWAREZATION
FOR THE INTERNET OF THINGS**

Mohamed Ali Zormati, Hicham Lakhlef and Sofiane Ouni

**AN ADAPTIVE TRANSMISSION STRATEGY FOR
TILED 360-DEGREE VR VIDEOS IN NOMA
SYSTEMS**

Hsueh-Wen Tseng, Ting-Ting Yang and Yi Yang

WED 11:30 – 13:00

Room: Press Room

(KRR) Knowledge Representation and
Reasoning Track
Session Chair: Eric Monfroy

**COLLECTIVE ATTACKS IN ASSUMPTION-
BASED ARGUMENTATION**

Ofer Arieli and Jesse Heyninck

**THE ABSTRACT EXPRESSIVE POWER OF
FIRST-ORDER AND DESCRIPTION LOGICS
WITH CONCRETE DOMAINS**

Franz Baader and Filippo De Bortoli

**EQUIPPING ABSTRACT ARGUMENTATION
SOLVERS FOR VERIFYING NEGATIVE RESULTS**

Wolfgang Dvorak, Alexander Greßler and Stefan Woltran

**TOWARDS VALUE-AWARENESS IN
ADMINISTRATIVE PROCESSES: AN APPROACH
BASED ON CONSTRAINT ANSWER SET
PROGRAMMING**

Joaquín Arias, Mar Moreno-Rebato, José Antonio
Rodríguez-García and Sascha Ossowski

**A MATHEMATICAL CONCEPTUALIZATION OF
BUNDLE SETS IN DEFEASIBLE LOGIC
PROGRAMMING**

Yamil Soto, Cristhian Ariel D. Deagustini, Maria Vanina
Martinez and Gerardo Simari

WED 13:00 – 14:30

Lunch Break

(Congress Hall)

WED 14:30 – 16:00

Room: 1

(MLA-1) Machine Learning and its
Applications Track

Session Chairs: Keon Myung Lee and Jee-Hyong Lee

**IDENTIFYING CHINESE HANDWRITING
CHARACTERISTICS FOR DETECTING
CHILDREN WITH AUTISM**

Ling Kai Yen, Jasin Wong and Arbee Chen

**NAVIGATING WEBAI: TRAINING AGENTS TO
COMPLETE WEB TASKS WITH LARGE
LANGUAGE MODELS AND REINFORCEMENT
LEARNING**

Lucas-Andrei Thil, Mirela Popa and Gerasimos Spanakis

**LEVERAGING SENTINEL-2 TIME SERIES FOR
BARK BEETLE-INDUCED FOREST DIEBACK
INVENTORY**

Giuseppina Andresini, Annalisa Appice and
Donato Malerba

**RAAD: REINFORCED ADVERSARIAL ANOMALY
DETECTOR**

Simon Woo, Daeyoung Yoon, Yuseung Gim and
Eunseok Park

**EXPLORING THE EFFICIENT MARKET
HYPOTHESIS FOR ACCURATE STOCK
MOVEMENT PREDICTION VIA FEATURE-AXIS
TRANSFORMER**

Kanghyeon Seo and Jihoon Yang

WED 14:30 – 16:00
Room: 2

(LASD-1) Lean and Agile
Software Development
Session Chair: Adam Przybyłek

COMMON LESS TRANSFORMATION PATTERNS

Alena Buchalceva and Jakub Hermanek

**BEYOND TECHNICAL DEBT UNRAVELLING
ORGANISATIONAL DEBT CONCEPT**

Muhammad Ovais Ahmad and Osama Al-Baik

**CHALLENGES TO SUSTAINING AGILITY:
AN EXPLORATORY CASE STUDY**

Mali Senapathi and Diane E Strode

**NAVIGATING CULTURAL DIVERSITY:
BARRIERS AND BENEFITS IN MULTICULTURAL
AGILE SOFTWARE DEVELOPMENT TEAMS**

Daniel Welsch, Luisa Burk, David Mötetfindt and
Michael Neumann

WED 14:30 – 16:00
Room: 3

(SEC-1) Computer Security Track
Session Chair: Diego Sempreboni

**DEEPPFAKE SPEECH DETECTION:
A SPECTROGRAM ANALYSIS**

Anton Firc, Kamil Malinka and Petr Hanáček

**DETECTION OF SLOWLORIS ATTACKS USING
MACHINE LEARNING ALGORITHMS**

Vinicius De Miranda Rios, Pedro Inácio, Damien Magoni
and Mario Freire

EVADING BOTNET DETECTION

Lisa-Marie Geiginger and Tanja Zseby

**OASIS: AN ORGANIZATIONAL CERTIFICATELESS
AGGREGATE SIGNATURE SCHEME IN
DISTRIBUTED NETWORKS FOR IOT**

Clementine Gritti

WED 14:30 – 16:00
Room: Mirador

(IE-1) IoT and Edge Computing
Session Chairs: Hong Min and Sabur Baidya

**IOT QUERY LATENCY ENHANCEMENT BY
RESOURCE-AWARE TASK PLACEMENT IN THE
FOG**

Fatima Abdullah, Mian Muaz Razaq, Youyang Kim,
Limei Peng, Young-kyoon Suh and Byungchul Tak

**DCS-ORIENTED IOT ARCHITECTURE FOR
ENHANCED CATTLE FEED PRECISION**

Guilherme Defalque, Ricardo R. Santos, Pedro A. P. C.
Castro, Marcio C. B. Pache and Ricardo Aguiar

**ETHEREUM ATTESTATION SERVICE AS A
SOLUTION FOR THE REVOCATION OF
HARDWARE-BASED PASSWORD-LESS
MECHANISMS**

Biagio Boi, Christian Esposito and Jung Taek Seo

**QUAD-BIOMETRICS FOR FEW-SHOT USER
IDENTIFICATION**

Christian Esposito, Chang Choi and JunHo Yoon

WED 14:30 – 16:00
Room: Press Room

(DBDM) Databases and Big Data
Management Track
Session Chairs: Ramzi Haraty and Junping Sun

**A DECLARATIVE QUERY LANGUAGE ENABLED
AUTONOMOUS DEEP WEB SEARCH ENGINE**

Kallol Naha and Hasan Jamil

**CROSS-LINGUAL LEARNING STRATEGIES FOR
IMPROVING PRODUCT MATCHING QUALITY**

Andre Alves, Cláudio de Souza Baptista, Luciano Barbosa
and Clécio B.M. Araújo

**MIGUE-SIM: SPEEDING UP SIMILARITY
QUERIES WITH NATIVE RDBMS RESOURCES**

Igor Eleuterio, Mirela Cazzolato, Larissa Roberta Teixeira,
Marco Antonio Gutierrez, Agma Juci Machado Traina and
Caetano Traina Jr.

**REGRET MINIMIZATION IN BILLBOARD
ADVERTISEMENT UNDER ZONAL INFLUENCE
CONSTRAINT**

Dildar Ali, Suman Banerjee and Yamuna Prasad

**DIAPPROX: DIFFERENTIAL PRIVACY-BASED
ONLINE RANGE QUERIES APPROXIMATION
FOR MULTIDIMENSIONAL DATA**
Ala eddine Laouir and Abdesammad Imine

WED 15:00 – 17:00

PM Poster Session

Posters of the following Tracks: **CC, CPS,
DADS, DAPP, DBDM, DS, HIBIO, IE, INTOP,
KNLP, KRR, LASD, NET, PL, RE,
SATTA, SE, SP, ST, SVT**

(See page 25 for detailed list of Posters)

Wed 16:00 – 16:30

Coffee Break

WED 16:30 – 17:30

Room: 1

(MLA-2) Machine Learning and its
Applications Track
Session Chairs: Keon Myung Lee and Jee-Hyong Lee

**A HETEROGENEOUS ENSEMBLE METHOD FOR
HANDLING CLASS NOISE IN SUPERVISED
MACHINE LEARNING**

Rashida Hasan and Chee-Hung Chu

**OPTIMIZING MOVIE SELECTIONS: A MULTI-
TASK, MULTI-MODAL FRAMEWORK WITH
STRATEGIES FOR MISSING MODALITY
CHALLENGES**

Subham RAJ, Pawan Agrawal, Sriparna Saha, Brijraj Singh
and Niranjana Pedanekar

**ACTION ATTENTION GRU: A DATA-DRIVEN
APPROACH FOR ENHANCING PURCHASE
PREDICTIONS IN DIGITAL MARKETING**

Girim Ban, Simon Woo and David Sung

WED 16:30 – 17:30

Room: 2

(LASD-2) Lean and Agile Software
Development
Session Chair: Michael Neumann

**TECHNICAL DEBT MANAGEMENT IN AGILE
CONTEXT: A NEW FRAMEWORK AND CASE
STUDY IN A LARGE FINANCIAL INSTITUTION**

Gisela Archela, Ana C V Melo and Vagner Luiz Gava

**REVISITING TECHNICAL DEBT TYPES AND
INDICATORS FOR SOFTWARE SYSTEMS**

Dilek Caglayan and Ozden Ozcan-Top

**THE USE OF PROTOTYPES AS A TOOL IN
AGILE SOFTWARE DEVELOPMENT**

Vivian Larrea, Milene Selbach Silveira and Tiago da Silva

WED 16:30 – 17:30

Room: 3

(SEC-2) Computer Security Track
Session Chair: Diego Sempredoni

**IS THE CANARY DEAD? ON THE
EFFECTIVENESS OF STACK CANARIES ON
MICROCONTROLLER SYSTEMS**

Xi Tan, Sagar Mohan, MD Armanuzzaman, Zheyuan Ma,
Gaoxiang Liu, Alex Eastman, Hongxin Hu and
Ziming Zhao

**OBFUSCATED PHP WEBSHELL DETECTION
USING THE WEBSHELL TAILORED TEXTRANK
ALGORITHM**

Hye Ju Lee, Seon jin Hwang, Millati Pratiwi and
Yoon-Ho Choi

**GENESIS: A GENERALIZABLE, EFFICIENT,
AND SECURE INTRA-KERNEL PRIVILEGE
SEPARATION**

Seongman Lee, Seoye Kim, Chihyun Song,
Byeongsu Woo, Eunyeong Ahn, Junsu Lee, Yeongjin Jang,
Jinsoo Jang, Hojoon Lee and Brent ByungHoon Kang

WED 16:30 – 17:30

Room: Mirador

(IE-2) IoT and Edge Computing
Session Chairs: Hong Min and Sabur Baidya

**RUL PREDICTION OF LITHIUM-ION BATTERIES
USING A FEDERATED AND HOMOMORPHICALLY
ENCRYPTED LEARNING METHOD**

Víctor López, Oscar Fontenla-Romero, Elena Hernández-Pereira, Berta Guijarro-Berdiñas, Carlos Blanco-Sejso and Samuel Fernández-Paz

**COST-BASED LOAD BALANCING OF RDF
REASONING IN FOG-COMPUTING
ENVIRONMENTS**

Yuma Kokubo and Toshiyuki Amagasa

WED 16:30 – 17:30

Room: Press Room

(DS) Data Streams
Session Chair: Albert Bifet

**JUST CHANGE ON CHANGE: ADAPTIVE
SPLITTING TIME FOR DECISION TREES IN
DATA STREAM CLASSIFICATION**

Daniel Assis, Fabrício Enembreck and Jean Paul Barddal

**DETECTING AND EXPLAINING ANOMALIES IN
THE AIR PRODUCTION UNIT OF A TRAIN**

Narjes Davari, Bruno Veloso, Rita Paula Ribeiro and João Manuel Portela da Gama

WED 17:30 – 19:00

**SIGAPP Annual Business
Meeting**

Thursday April 11, 2024

Thu 10:00-11:00

Room: Chamber Hall (0 floor)

Keynote Address

Dr. Paulo Novais
See page 16 for details.

Thu 11:00 – 11:30

Coffee Break

THU 11:30 – 13:00

Room: 1

(MLA-3) Machine Learning and its
Applications Track
Session Chairs: Keon Myung Lee and Jee-Hyong Lee

**DTC-TRANGRU: IMPROVING THE
PERFORMANCE OF THE NEXT-DTC
PREDICTION MODEL WITH
TRANSFORMER AND GRU**

Abdul Basit Hafeez, Eduardo Alonso and Atif Riaz

**CADI: CONTEXTUAL ANOMALY DETECTION
USING AN ISOLATION FOREST**

Véronne Yepmo, Grégory Smits, Marie-Jeanne Lesot and Olivier Pivert

**CROSS-DOMAIN CORAL IMAGE
CLASSIFICATION USING DUAL-STREAM
HIERARCHICAL NEURAL NETWORKS**

Hongyong Han, Wei Wang, Gaowei Zhang,
Mingjie Li and Yi Wang

**GUARDML: EFFICIENT PRIVACY-PRESERVING
MACHINE LEARNING SERVICES THROUGH
HYBRID HOMOMORPHIC ENCRYPTION**

Eugene Frimpong, Khoa Nguyen, Mindaugas Budzys,
Tanveer Khan and Antonis Michalakis Noh

THU 11:30 – 13:00

Room: 2

(SEC-3) Computer Security Track
Session Chair: Diego Sempredoni

SECURITY IMPLICATIONS OF DEEPPAKES IN FACE AUTHENTICATION

Milan Šalko, Anton Firc and Kamil Malinka

FINDING HARMONY IN THE NOISE: BLENDING SECURITY ALERTS FOR ATTACK DETECTION

Tom-Martijn Roelofs, Eduardo Barbaro, Svetlana Pekarskikh, Katarzyna Orzechowska, Marta Kwapien, Jakub Tyrlik, Dinu Smadu, Michel van Eeten and Yury Zhauniarovich

PATCH PILGRIMAGE: EXPLORING THE LANDSCAPE OF TCP REFLECTIVE ATTACKS AND USER PATCHING EXPEDITION

Joost Oortwijn and Carlos Ganan

ENERGY EFFICIENT OBFUSCATION OF SIDE-CHANNEL LEAKAGE FOR PREVENTING SIDE-CHANNEL ATTACKS

Shan Jin, Minghua Xu and Yiwei Cai

THU 11:30 – 13:00

Room: 3

(SVT) Software Verification and Testing
Session Chairs: Sangharatna Godbole and Anders Schlichtkrull

VERIFICATION OF CONCURRENT MACHINE CODE RUNNING ON A SINGLE-CORE MACHINE

Narges Khakpour

(NEAREST) NEIGHBORS YOU CAN RELY ON: FORMALLY VERIFIED K-D TREE CONSTRUCTION AND SEARCH IN COQ

Nadeem Hamid

RESOURCE CONSTRAINED TEST CASE PRIORITIZATION WITH SIMULATED ANNEALING IN AN INDUSTRIAL CONTEXT

Eric Felding, Per Strandberg, Nils-Hassan Quttineh and Wasif Afzal

QUANTIFYING SOFTWARE CORRECTNESS BY COMBINING ARCHITECTURE MODELING AND FORMAL PROGRAM ANALYSIS

Florian Lanzinger, Christian Martin, Frederik Reiche,

Samuel Teuber, Robert Heinrich and Alexander Weigl
A FORMAL FRAMEWORK OF MODEL AND LOGICAL EMBEDDINGS FOR VERIFICATION OF STOCHASTIC SYSTEMS

Susmoy Das and Arpit Sharma

CONCURRENT NETKAT WITH PORTS

Hui Feng and Marcello Bonsangue

THU 11:30 – 13:00

Room: Mirador

(NET) Networking
Session Chair: Mário Freire

RESCUING QUIC FLOWS FROM COUNTERMEASURES AGAINST UDP FLOODING ATTACKS

Junseok Lee, Minhyeong Kim, Wonjun Song, Younghoon Kim and Dohyung Kim

CLASSIFICATION OF HOME NETWORK PROBLEMS WITH TRANSFORMERS

Jeremias Dötterl and Zahra Hemmati Fard

VIRTUAL LINK EMBEDDING IN COLLABORATIVE SLICED MULTI-ADMINISTRATIVE MULTI-DOMAIN NETWORKS

Stanislas Pedebearn, Slim Abdellatif, Pascal Berthou, Dariusz Nogalski and Dallal Belabed

Thu 13:00 – 14:30

Lunch Break

(Conference venue)

THU 14:30 – 16:00

Room: 1

(MLA-4) Machine Learning and its Applications Track
Session Chairs: Keon Myung Lee and Jee-Hyong Lee

EFFICIENT DUAL ATTENTION TRANSFORMER FOR IMAGE SUPER-RESOLUTION

Soobin Park, Yuna Jeong and Yong Suk Choi

EXPLAINABLE ARTIFICIAL INTELLIGENCE (XAI) APPROACH FOR REINFORCEMENT LEARNING SYSTEMS

Joelma Peixoto and Akramul Azim

FAST BIPARTITE FORESTS FOR SEMI-SUPERVISED INTERACTION PREDICTION

Pedro Ilídio, André Alves and Ricardo Cerri

IMPROVING SOFT SKILL EXTRACTION VIA DATA AUGMENTATION AND EMBEDDING MANIPULATION

Muhammad Uzair Ul Haq, Paolo Frazzetto, Giovanni Da San Martino and Alessandro Sperduti

THU 14:30 – 16:00

Room: 2

(SEC-4) Computer Security Track

Session Chair: Diego Sempredoni

COLLECTION AND ANALYSIS OF SENSITIVE DATA WITH PRIVACY PROTECTION BY A DISTRIBUTED RANDOMIZED RESPONSE PROTOCOL

Faisal Imran and Rosa Meo

STATE-BASED MODELING AND VERIFICATION OF SMART CONTRACTS

Chiara Braghin, Elvinia Riccobene and Simone Valentini

A PRIVACY-AWARE REMAPPING MECHANISM FOR LOCATION DATA

Guilherme Duarte, Mariana Cunha and Joao Vilela

FORGET ABOUT IT: BATCHED DATABASE SANITIZATION

James Wagner and Alexander Rasin

THU 14:30 – 16:00

Room: 3

(SE-1) Software Engineering Track

Session Chair: Geunseok Yang

YOU CANNOT IMPROVE WHAT YOU DO NOT MEASURE: A TRIANGULATION STUDY OF SOFTWARE SECURITY METRICS

Arina Kudriavtseva and Olga Gadyatskaya

SBOM GENERATION TOOLS UNDER MICROSCOPE: A FOCUS ON THE NPM ECOSYSTEM

Md Fazle Rabbi, Arifa Islam Champa, Costain Nachuma and Minhaz Fahim Zibran

RANKED SYNTAX COMPLETION WITH LR PARSING

Kwanghoon Choi, Sooyeon Hwang, Hyeonah Moon and Isao Sasano

VERIFOG: A GENERIC MODEL-BASED APPROACH FOR VERIFYING FOG SYSTEMS AT DESIGN TIME

Hiba Awad, Abdelghani Alidra, Hugo Bruneliere, Thomas Ledoux, Etienne Leclercq and Jonathan Rivalan

Thu 16:00 – 16:30

Coffee Break

THU 16:30 – 18:00

Room: 1

(MLA-5) Machine Learning and its Applications Track

Session Chairs: Keon Myung Lee and Jee-Hyong Lee

TRAINING HETEROGENEOUS CLIENT MODELS USING KNOWLEDGE DISTILLATION IN SERVERLESS FEDERATED LEARNING

Mohak Chadha, Pulkit Khera, Jianfeng Gu, Osama Abboud and Michael Gerndt

REWARD SPECIFICATIONS IN COLLABORATIVE MULTI-AGENT LEARNING: A COMPARATIVE STUDY

Maram Hasan and Rajdeep Niyogi

EXPLAINABLE PONZI SCHEMES DETECTION ON ETHEREUM

Letterio Galletta and Fabio Pinelli

AR-SPIDER: TEXT-TO-SQL IN ARABIC

Saleh Almohaimeed, Saad Almohaimeed, Mansour Al Ghanim and Liqiang Wang

THU 16:30 – 18:00

Room: 2

(PL) Programming Languages Track
Session Chair: Barrett Bryant

**COMPILING HASKELL FOR ENERGY
EFFICIENCY: EMPIRICAL ANALYSIS OF
INDIVIDUAL TRANSFORMATIONS**

Bernardo Santos, João Paulo Fernandes, Maja Kirkeby
and Alberto Pardo

**LIGHTWEIGHT COMPILATION OF METHOD
INVOCATION BYTECODES IN JAVA**

Harpreet Kaur, Scott Ryan Young, Marius Pirvu and
Kenneth Blair Kent

**LIGHTWEIGHT DSL FOR DESCRIBING
EXTENSIBLE TRANSITION SYSTEMS**

Seiji Umatani

**AN ASYNCHRONOUS SCHEME FOR ROLLBACK
RECOVERY IN MESSAGE-PASSING
CONCURRENT PROGRAMMING LANGUAGES**

German Vidal

THU 16:30 – 18:00

Room: 3

(SE-2) Software Engineering Track
Session Chair: Byungjeong Lee

**INFORMATION NEEDS IN CONTINUOUS
INTEGRATION AND DELIVERY IN LARGE
SCALE ORGANIZATIONS: AN OBSERVATIONAL
STUDY**

Azeem Ahmad, Kristian Sandahl, Daniel Hasselqvist and
Pontus Sandberg

**A LARGE-SCALE STUDY OF ML-RELATED
PYTHON PROJECTS**

Samuel Idowu, Yorick Sens, Thorsten Berger,
Jacob Krueger and Michael Vierhauser

**FROM FINE-TUNING TO OUTPUT: AN
EMPIRICAL INVESTIGATION OF TEST SMELLS
IN TRANSFORMER-BASED TEST CODE
GENERATION**

Ahmed Aljohani and Hyunsook Do

**METHODOLOGY FOR RESILIENCY ANALYSIS
OF MISSION-CRITICAL SYSTEMS**

Mahmoud Abdelgawad and Indrakshi Ray

THU 16:30 – 18:00

**SRC Oral Presentation
Room: Mirador**

See page 27 for details.

THU 18:00 – 19:00

Track Chairs Meeting

THU 20:00 – 23:00

SAC Banquet

Friday April 14, 2024

FRI 10:00 – 12:00

SIGAPP Wrap-up Meeting

POSTERS LISTING

WED 11:00 - 13:00
AM Poster Session
(Panorama)

(AIED) EQUITY CHALLENGES IN ONLINE LEARNING IN THE AGE OF CHATGPT

Hasan Jamil

(AIED) UTILIZING EXPLAINABLE AI TO ENHANCE REAL-TIME STUDENT PERFORMANCE PREDICTION IN EDUCATIONAL SERIOUS GAMES

Manuel J. Gomez, Álvaro Armada Sánchez, Mariano Albaladejo-González, Félix J. García Clemente and José A. Ruipérez-Valiente

(AIED) OPEN PLAYER MODELING - USING AI TO HELP REFLECTION AND LEARNING IN SERIOUS GAMES

Sai Siddartha Maram, Jennifer Villareale, Jichen Zhu and Magy Seif El-Nasr

(AIED) AN INSTRUCTOR'S LENS INTO THE ROLE OF AI IN TEACHING EXPERIMENTAL RESEARCH VIA GAMIFICATION

Sai Siddartha Maram, Anna Amato, Giovanni M Troiano, Steven C Sutherland, Camillia Matuk, Edward Melcer, Elin Carstensdottir, Casper Hartevelde and Magy Seif El-Nasr

(AIED) AUTHORING WORKED EXAMPLES FOR JAVA PROGRAMMING WITH HUMAN AI COLLABORATION

Mohammad Hassany, Jiaze Ke, Peter Brusilovsky, Arun Balajjee Lekshmi Narayanan and Kamil Akhuseyinoglu

(AIED) AUTHORING WORKED EXAMPLES FOR JAVA PROGRAMMING WITH HUMAN AI COLLABORATION

Mohammad Hassany, Jiaze Ke, Peter Brusilovsky, Arun Balajjee Lekshmi Narayanan and Kamil Akhuseyinoglu

(AIED) AN INTEGER LINEAR PROGRAMMING MODEL BASED ON COMPETENCES FOR STUDENT-INDUSTRY PLACEMENT ALLOCATION

Moumena Salah Yassen, Victor Sanchez-Anguix, Juan M. Alberola and Fulgencia Villa

(AIED) DUTY VS. CONSEQUENCE: EXPLORING TEACHERS' ASSESSMENT OF THE ETHICAL DIMENSIONS OF GENERATIVE AI TECHNOLOGIES

Stephen Aguilar and Changzhao Wang

(EC) EVOLUTIONARY FEATURE SELECTION FOR TIME-SERIES FORECASTING

María Lourdes Linares-Barrera, Manuel J. Jiménez-Navarro, Isabel Sofia Brito, José C. Riquelme-Santos and María Martínez-Ballesteros

(EMBS) PROFILING VS STATIC ANALYSIS: THE IMPACT ON PRECISION TUNING

Lev Denisov, Gabriele Magnani, Daniele Cattaneo, Giovanni Agosta and Stefano Cherubin

(EMBS) PACKET-TYPE AWARE SCHEDULING OF MOLDABLE STREAMING TASKS ON MULTICORE SYSTEMS WITH DVFS

Michail Boulasikis, Christoph Kessler, Flavius Gruian, Jörg W Keller and Sebastian Litzinger

(EMBS) INCREASING TESTING ROBUSTNESS OF GPU SOFTWARE IN EMBEDDED CRITICAL SYSTEMS

Javier Barrera, Leonidas Kosmidis, Enrico Mezzetti, Jaume Abella and Francisco J Cazorla

(GMLR) LEARNING TO SOLVE COMBINATORIAL OPTIMIZATION PROBLEMS ON GRAPHS WITH STATE-AWARE MULTI-RELATION AGGREGATION

Hui-Ju Hung, Wang-Chien Lee, Tao-Yang Fu, Chih-Ya Shen and Zhen Lei

(GMLR) LESS IS MORE: A STREAMLINED GRAPH-BASED FASHION OUTFIT RECOMMENDATION WITHOUT MULTIMODAL DEPENDENCY

Daehee Kim, donghee han, Daeyoung Roh, Keejun Han and Mun Yong Yi

(IRMAS) BAYESIAN SOFT ACTOR-CRITIC: A DIRECTED ACYCLIC STRATEGY GRAPH BASED DEEP REINFORCEMENT LEARNING

Qin Yang and Ramvijas Parasuraman

(ISDE) POTHOLEVISION: AN AUTOMATED POTHOLE DETECTION AND REPORTING SYSTEM USING COMPUTER VISION

Zachary Jeffreys, Kshama Kumar, Zhuojing Xie, Wan Bae, Shayma Alkobaisi and Sada Narayanappa

(ISDE) EMPLOYEE EXPERIENCE REPRESENTATION FOR PERSONALIZATION WITHIN DIGITAL BUSINESS ECOSYSTEMS

Mustapha Kamal BENRAMDANE, Elena Kornyshova, Sébastien Ruelle and Charles Vidal

(MLA) A MODEL FOR DETECTING ABNORMALITY IN ACTIVITIES OF DAILY LIVING SEQUENCES USING INVERSE REINFORCEMENT LEARNING

Fateme Akbari and Kamran Sartipi

(MLA) M-DBSCAN: MODIFIED DBSCAN CLUSTERING ALGORITHM FOR DETECTING AND CONTROLLING OUTLIERS

Momotaz Begum, Mehedi Hasan Shuvo, Md. Golam Mostofa, ABM Kamrul Islam Riad, Md Arabin Islam Talukder, Mst Shapna Akter and Hossain Shahriar

(MLA) DECOUPLING DECISION-MAKING IN FRAUD PREVENTION THROUGH CLASSIFIER CALIBRATION FOR BUSINESS LOGIC ACTION

Emanuele Luzio, Moacir Ponti, Christian Ramirez Arevalo and Luis Argerich

(MLA) ENHANCING VIDEO CAPTURE IN MOBILE APPLICATIONS FOR POWER SAVING THROUGH MACHINE LEARNING

Tzu-Heng Chen, Sheng-Da Tsai and Chun-Han Lin

(MLA) ELEVATING CTR PREDICTION: FIELD INTERACTION, GLOBAL CONTEXT INTEGRATION, AND HIGH-ORDER REPRESENTATIONS

Sojeong Kim, Dongjun Lee and Jaekwang Kim

(MLA) DROPACTER : COMPACTER-BASED TUNING WITH LAYER FREEZING IN PRE-TRAINED LANGUAGE MODEL

Saurabh Anand, Shubham Malaviya, Manish Shukla and Sachin Lodha

(MLA) REBALANCING SHARED MOBILITY SYSTEMS BY USER INCENTIVE SCHEMES: STATE-ACTION REPRESENTATION DESIGN AND ANALYSIS

Matthew Schofield, Ning Wang and Shen-Shyang Ho

(MLA) OPEN-VOCABULARY AND MULTITASK IMAGE SEGMENTATION

Lihu Pan, Yunting Yang, Zhengkui Wang, Wen Shan and Jiali Yin

(MLA) AN EFFECTIVE AND EFFICIENT GREEN FEDERATED LEARNING METHOD FOR ONE-LAYER NEURAL NETWORKS

Oscar Fontenla-Romero, Berta Guijarro-Berdiñas, Elena Hernández-Pereira and Beatriz Pérez-Sánchez

(MLA) EVALUATING KNOWLEDGE RETENTION IN CONTINUAL LEARNING

Andrii Krutsylo

(MLA) MULTIMODAL FUSION OF HETEROGENEOUS REPRESENTATIONS FOR ANOMALY CLASSIFICATION IN SATELLITE IMAGERY

Youngsun Jang, Maryam Moshrefizadeh, Abir Mohammad Hadi, Kwanghee Won and John Kim

(MLA) TOWARDS AIRCRAFT TRAJECTORY PREDICTION USING LSTM NETWORKS

Jorge Silvestre, Paula Mielgo, Miguel A. Martínez-Prieto, Anibal Bregon and Pedro C. Álvarez-Esteban

(MLA) CONTROLLING THE LATENT SPACE OF GANS THROUGH REINFORCEMENT LEARNING: A CASE STUDY ON TASK-BASED IMAGE-TO-IMAGE TRANSLATION

Mahyar Abbasian, Taha Rajabzadeh, Ahmadreza Moradipari, Seyed Amir Hossein Aqajari, Hongsheng Lu and Amir M. Rahmani

(MLA) THE PERFORMANCE OF SEQUENTIAL DEEP LEARNING MODELS IN DETECTING PHISHING WEBSITES USING CONTEXTUAL FEATURES OF URLS

Saroj Gopali, Akbar S. Namin, Faranak Abri and Keith S. Jones

(MLA) IDENTIFYING OUT-OF-STOCK ITEMS AT RETAIL STORES USING COMPUTER VISION

Maria Nicos Alain Pasaylo, Nour Kawani, Camilla Fonseca and Bethlehem Megabiaw Tassew

WED 15:00 - 17:00
PM Poster Session
(Panorama)

(CC) SADHE: SECURE ANOMALY DETECTION FOR GPS TRAJECTORY BASED ON HOMOMORPHIC ENCRYPTION

Priyanka Singh, Jash Rathi and Priyankaben Babulal Patel

(CPS) CANLP: NLP-BASED INTRUSION DETECTION SYSTEM FOR CAN

Kavya Balasubramanian, Adithya Gowda Baragur, Denis Donadel, Dinuka Sahabandu, Alessandro Brighente, Bhaskar Ramasubramanian, Mauro Conti and Radha Poovendran

(CPS) OLIVE: FLEXIBLE, PORTABLE, AND SUSTAINABLE V2X MULTI-FACTOR AUTHENTICATION

Marco De Vincenzi, Chiara Bodei and Ilaria Matteucci

(CPS) AUTOENCODER-BASED CONTINUAL OUTLIER CORRELATION DETECTION FOR REAL-TIME TRAFFIC FLOW PREDICTION

Himanshu Choudhary and Marwan Hassani

(DADS) ON THE RELIABILITY OF TIME-SENSITIVE NETWORK INFRASTRUCTURES

Willi Brekenfelder, Tom Reincke, Helge Parzyjegl, Peter Danielis, Omer Hanif Khan and Gero Muehl

(DAPP) USING BLOCKCHAIN FOR INCENTIVE-DRIVEN FHIR-BASED HEALTH RECORD EXCHANGE

Moritz Rosar and Kun-Ta Chuang

(DAPP) FORMALIZATION AND VERIFICATION OF DELEGATE CONTRACT SIGNING MECHANISM BASED ON SMART CONTRACT USING CSP

BANGJIE ZHU, JIAQI YIN, Sini Chen and Huibiao Zhu

(DBDM) EMBEDDB: A HIGH-PERFORMANCE DATABASE FOR RESOURCE-CONSTRAINED EMBEDDED SYSTEMS TOO SMALL FOR SQLITE

Justin Schoenit, Seth Akins and Ramon Lawrence

(DBDM) MODELLING AND EVOLUTION MANAGEMENT OF MULTI-MODEL DATA

Jachym Bartik, Pavel Koupil and Irena Holubova

(DS) WHERE DO WE GO FROM HERE? LOCATION PREDICTION FROM TIME-EVOLVING MARKOV MODELS

Thiago Andrade and Joao Gama

(DS) DRIFTGAN: USING HISTORICAL DATA FOR UNSUPERVISED RECURRING DRIFT DETECTION

Christofer Fellicious, Sahib Julka, Lorenz Wendlinger and Michael Granitzer

(HIBIO) ANALYSIS OF VOICE RECORDINGS FEATURES FOR CLASSIFICATION OF PARKINSON'S DISEASE

Beatriz Pérez-Sánchez, Noelia Sánchez-Marroño and Miguel A. Díaz-Freire

(HIBIO) FEDERATED LEARNING FOR UNSUPERVISED ANOMALY DETECTION OF ADLS IN SINGLE-RESIDENT ELDERLY SMART HOMES

Zahraa Shahid, Saguna Saguna, Christer Åhlund and Karan Mitra

(IE) IMPROVING PRIVACY IN FEDERATED LEARNING-BASED INTRUSION DETECTION FOR IOT NETWORKS

Lamine Syne, Pino Caballero-Gil and Candelaria Hernández-Goya

(INTOP) CROSS-CHAIN PAYMENTS ON BLOCKCHAIN NETWORKS: AN APARTMENT BOOKING USE-CASE

Dušan Morháč, Viktor Valaštín, Kristian Kostal and Ivan Kotuliak

(KNLP) IMPACT OF POSITION BIAS ON LANGUAGE MODELS IN TOKEN CLASSIFICATION

Mehdi Ben Amor, Michael Granitzer and Jelena Mitrović

(KRR) CLASSIFYING WORDS WITH 3-SORT AUTOMATA

Tomasz Jastrzab, Frederic Lardeux and Eric Monfroy

(KRR) AN EPISTEMIC LOGIC FOR MODELING DECISIONS IN THE CONTEXT OF INCOMPLETE KNOWLEDGE

Djordje Markovic, Simon Vandevelde, Linde Vanbesien, Joost Vennekens and Marc Denecker

(LASD) UMASK-AFL: UNMASKING ALL REACHABLE TARGETS FOR COMPREHENSIVE AGILE FUZZING

SANGHARATNA GODBOLEY, Bikash Singha, Monika Rani Golla and P. R Krishna

**(LASD) IMPLEMENTING ACTION ITEMS
OVER IMPROVING THE FORMAT OF
RETROS**

Yen Ying Ng and Ryszard Kuduk

**(NET) GENERATING APPROXIMATE STEINER
TREE FROM A FULLY DYNAMIC APPROXIMATE
MST OF A PLANAR GRAPH**

Hemraj Raikwar, Miki Maheshbhai Patel and
Sushanta Karmakar

**(NET) MICRO-CHAIN: TOWARDS THE USE OF
NDN MICROSERVICES**

Otávio Augusto da Cruz, Carlos Eduardo Pereira, Edison
Pignaton de Freitas, Antonio Arlis Santos da Silva, Denis
Lima Do Rosário, Eduardo Coelho Cerqueira, Paulo Mendes
and Julio Cesar Santos dos Anjos

**(PL) A DOMAIN-SPECIFIC LANGUAGE FOR
AUGMENTED REALITY GAMES**

Michel Bourdelles, Jamal EL HACHEM and Salah Sadou

**(RE) HYBRID ACTIVE TEACHING
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