

RoCHI – International Conference on Human-Computer Interaction

Proceedings of the 19th International Conference
on Human-Computer Interaction – RoCHI 2022

6-7 October 2022



Craiova, Romania



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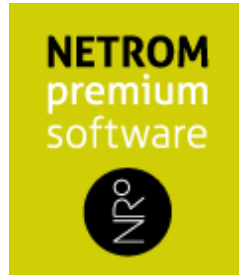
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Foreword

RoCHI 2022 is the 19th edition of the International Conference on Human-Computer in Romania. Since its creation, the RoCHI conference has covered many research topics in the field of human-computer interaction, while following the evolution of interactive technologies. The papers presented this year are representative of very current trends. Among the specificities of the 2022 edition, it is important to highlight the influence of the pandemic on interaction situations, as well as the growing importance of connections between machine learning & deep learning, and HCI.

The conference had 39 submissions from authors from different countries. Even if the majority of the authors of the submitted articles come research centers from Romania, we can note that several were submitted by authors from Belgium, France, India, Spain and United States. In the end, 26 papers were accepted for presentation and for publication at the conference, thus resulting in an acceptance rate of 66,67%. Three papers submitted as long papers were also accepted in as shorter format. The majority of the articles were evaluated by 4 or 5 reviewers. Only two of them were reviewed by 3 reviewers, but with converging opinions of all three.

The conference had two keynote speakers who brought complementary visions from Software Engineering and Artificial Intelligence: Guilherme Horta Travassos, from COPPE/UFRJ, Brazil, with a talk entitled “From Ad-hoc to Rapid Reviews: a systematic (and not so rapid) evolution”, and Vicente Julian Inglada, from Polytechnic University of Valencia, Spain, with a talk on “Cognitive assistants and intelligent agents”.

The papers were divided into eight main topic areas covering a wide range of the HCI discipline: (1) Augmented Reality & User eXperience, (2) Interaction and learning during the pandemic, (3) Games, vision & animation, (4) Usability & security in Social networks and Society, (5) Machine learning & Deep learning for interactive applications, (6) Adaptation, agents & recommender systems, (7) VR for UX, UX of VR, (8) Technology Acceptance & User-Centered Design.

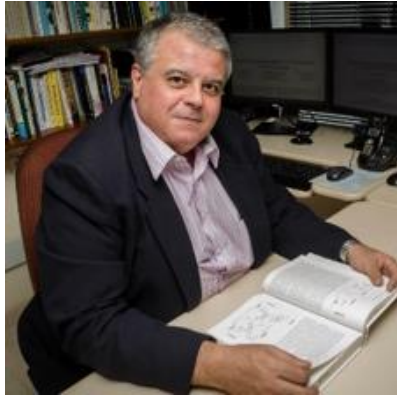
An industry session with invited presenters from companies ENDAVA, IMOPEDIA and NETROM SOFTWARE was also organized.

We would like to thank all the members of the program committee and all the reviewers for their involvement in the evaluation process and for their constructive comments. These comments are often very valuable to the authors, whether their article is accepted or not. We thank also warmly all who contributed to the success of the 2022 edition, including authors, presenters, attendees, associate chairs, members of the organizing committee, administrators, technicians, as well as the involved institutions and sponsors.

Editors,

Paul-Ștefan Popescu and Christophe Kolski

Keynote: From Ad-hoc to Rapid Reviews: a systematic (and not so rapid) evolution



Professor Guilherme Horta Travassos
*Alberto Luiz Coimbra Institute for
Graduate Studies and Research in
Engineering, COPPE/UFRJ, Brazil*

Abstract: Literature reviews used to be the seed of most investigations and research activities. They are usually simple to execute and mostly are performed ad-hoc. However, ad-hoc literature reviews, despite their usefulness to start studies on determining topics of interest, typically present low scientific strength due to a lack of replicability, coverage, and dependability of the researcher's experience. Therefore, researchers have invested in supporting more systematic literature reviews to minimize bias and provide more reliable findings to support their conclusions. It includes different strategies such as mapping studies, (quasi) Systematic Literature Reviews, and currently, Rapid Reviews. This talk intends to discuss and exemplify these different review strategies and their features in the context of Evidence-Based Software Engineering.

Biography: Guilherme Horta Travassos is an Electrical Engineer (UFJF, 1985), M.Sc. (1990) and D.Sc. (1994) in Systems and Computer Engineering from COPPE/UFRJ. Held a Post-Doctoral internship at the University of Maryland – College Park together with SEL/NASA (the USA – 98/00), with the main focus on applied experimentation in Software Engineering and software product lines. He is currently a full professor, CNPq researcher, FAPERJ CNE, and head of the Systems and Computer Engineering Graduate Program (PESC) at COPPE/UFRJ. His research interests are inserted in the context of Experimental Software Engineering and in the Engineering of Contemporary Software Systems, including software quality (VV&T), ubiquitous and context-aware systems, Internet of Things, simulation in software, environments, and tools to support software development and experimentation. He leads the Experimental Software Engineering group at COPPE/UFRJ. He is a member of ISERN, the Brazilian Computer Society, and ACM. He is an associate editor of Elsevier-Information and Software Technology. He is part of the editorial board of the other journals. He collaborates with the software industry through research & development projects developed by COPPE /UFRJ. Further information at www.cos.ufrj.br/~ght

Keynote: Cognitive assistants and intelligent agents



Professor Vicente Julian Inglada
Polytechnic University of Valencia, Spain

Abstract: Cognitive Assistants (CA) are a relatively new concept, advancing the Cognitive Orthotics concept that focuses on direct assistance to people with cognitive or physical disabilities and expanding the area to include complex platforms that include sensors, actuators, interfaces, monitoring abilities, and decision processes. CA is an area containing technologies such as personalized intelligent assistants, multi-agent systems, robotics, e-health applications, and others. This keynote will present several advances made in the area of cognitive assistants from the point of view of intelligent agents.

Biography: Full Professor of the Department of Computer Systems and Computing at the Polytechnic University of Valencia (UPV). He is also Deputy Director of Research of the Department of Computer Systems and Computation and Coordinator of the Doctorate Program in Computer Science of the UPV. He belongs to the Valencian Research Institute in Artificial Intelligence (VRAIN). The trajectory in terms of research projects is very regular. He has participated continuously in national and European research projects. His research area is artificial intelligence and, specifically, multi-agent systems. Throughout his scientific career, he has obtained different results in the development of autonomous intelligent systems applied to real-time systems (ARTIS and SIMBA), the coordination of distributed complex services (THOMAS), the development of adaptive virtual organizations (OVAMAH), human-agent coordination, and emotion recognition (iHAS) and, in recent years, in the application of agent technologies to the improvement of mobility especially in the urban environment (SURF and inEDGEmobility). The results obtained have been used in transfer projects related to maritime transport, the simulation of migratory processes, flexible manufacturing in industry 4.0, or the optimization of bike-sharing fleets and the location of electric vehicle charging points. In recent years, he has worked on developing cognitive assistants, obtaining different results in the form of robots or wearable devices mainly focused on improving the well-living of the elderly.

Presentation of the industry session

Title: Your future is bright, and so is the AR around you

Presenters: Gabriel-Octavian Dorobanțu & Andrei Razvan Șerban, *ENDAVA*

Abstract:

Augmented reality becomes more and more a part of our life, with a 34% increase in active mobile AR consumers, bringing the count to a record of 802 million users.

To embrace this trend, Endava decided to invest in an internal AR project to enhance the experience of our internal gatherings. Using the Unity game engine, the team developed EndavAR, which displays contextual information of predefined scanned images. This removes the need of using QR codes while creating an interactive experience with real-world objects.

Using the application is as simple as pointing your camera at a predefined image and enjoying the 3D animated and interactive result.

The project is based on AR Foundation, an easy-to-use cross-platform framework for augmented reality applications. The default behavior was customized to our needs, by only using the events that the framework provided and then defining our methods and creating our flows.

The visual effects were achieved by changing the result's transform properties according to the real-world objects and using composite transformations that react to the position and rotation of the camera.

As we strongly believe in the growth potential of this idea, we are already foreseeing numerous other applications, from better offering help and information to animating and personalizing the world around us for new and outstanding experiences.

Title: AI technologies for enhancing real estate apps

Presenters: Eduard Cojoclea & Mihai Masala, *IMOPEDIA*

Abstract: Given the large amounts of data available in real estate applications and also influenced by the recent uptake of Artificial Intelligence (AI) in various domains, real estate apps are also exploring how AI can be used to improve user experience and provide a better functionality for buyers, sellers, and real estate agents. We provide an overview of using various AI technologies, including machine learning, computer vision, image processing, and natural language processing, for several tasks relevant for real estate apps. The experiments were performed using data from Imopedia, one of the leading real estate portals in Romania, and the developed technologies are currently being integrated in the Imopedia app. We present how image processing and computer vision are used to detect similar and near-duplicate property listings and also to automatically tag images from listings in order to detect room and property types or the objects in a home. Then we analyze the performance of machine learning models for price prediction and detection of duplicate listings, together with some insights about the explainability of these models. Finally, we show how visit and click logs can be used to recommend properties similar to the preferences of a user and also to improve search by providing a personalized search.

Title: The importance of UX design combined with vertical specific know-how in digital product engineering

Presenters: George Sacerdotianu & Alex Dobre, *NETROM SOFTWARE*

Abstract:

Cases study: how a professional UX design can shape the controlling processes in fully automated greenhouses

Since the aim is to constantly improve the relationship between human and machine through interaction just by making engineering simple and fun, nowadays the controlling of sensors, robots and lifts, as well as tracking real-time KPIs, can be achieved with an innovative and smart user interaction design. In other words, we will show you how “to pilot” a greenhouse ecosystem just with “the power of a click”, relying on the guidance system of all technical installations. Mechanical systems not only have to ‘do what they have to do’, they also have to provide information for operational management. By empowering a professional UX design with this information, you can anticipate efficiently the developments in cultivation, processing, purchasing and sales in the horticulture vertical.