Lecture Notes in Networks and Systems 450

Leonard Barolli
Farookh Hussain
Tomoya Enokido *Editors*

Advanced Information Networking and Applications

Proceedings of the 36th International Conference on Advanced Information Networking and Applications (AINA-2022), Volume 2

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Lecture Notes in Networks and Systems

Volume 450

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Editors

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Welcome Message from AINA-2022 Organizers

Welcome to the 36th International Conference on Advanced Information Networking and Applications (AINA-2022). On behalf of AINA-2022 Organizing Committee, we would like to express to all participants our cordial welcome and high respect.

AINA is an international forum, where scientists and researchers from academia and industry working in various scientific and technical areas of networking and distributed computing systems can demonstrate new ideas and solutions in distributed computing systems. AINA was born in Asia, but it is now an international conference with high quality thanks to the great help and cooperation of many international friendly volunteers. AINA is a very open society and is always welcoming international volunteers from any country and any area in the world.

AINA International Conference is a forum for sharing ideas and research work in the emerging areas of information networking and their applications. The area of advanced networking has grown very rapidly, and the applications have experienced an explosive growth especially in the area of pervasive and mobile applications, wireless sensor networks, wireless ad-hoc networks, vehicular networks, multimedia computing and social networking, semantic collaborative systems, as well as grid, P2P, IoT, big data, and cloud computing. This advanced networking revolution is transforming the way people live, work, and interact with each other and is impacting the way business, education, entertainment, and health care are operating. The papers included in the proceedings cover theory, design, and application of computer networks, distributed computing, and information systems.

Each year AINA receives a lot of paper submissions from all around the world. It has maintained high-quality accepted papers and is aspiring to be one of the main international conferences on the information networking in the world.

We are very proud and honored to have two distinguished keynote talks by Prof. Mario A. R. Dantas, University of Juiz de Fora, Minas Gerais, Brazil, and Prof. Isaac Woungang, Ryerson University, Toronto, Ontario, Canada, who will present their recent work and will give new insights and ideas to the conference participants.

An international conference of this size requires the support and help of many people. A lot of people have helped and worked hard to produce a successful AINA-2022 technical program and conference proceedings. First, we would like to thank all authors for submitting their papers, the session chairs, and distinguished keynote speakers. We are indebted to program track co-chairs, program committee members and reviewers, who carried out the most difficult work of carefully evaluating the submitted papers.

We would like to thank AINA-2022 General Co-chairs, PC Co-chairs, and Workshops Co-chairs for their great efforts to make AINA-2022 a very successful event. We have special thanks to Finance Chair and Web Administrator Co-chairs.

We do hope that you will enjoy the conference proceedings and readings.

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AINA-2022 Keynote Talks

Data Intensive Scalable Computing in Edge/Fog/Cloud Environments

Mario A. R. Dantas

University of Juiz de Fora, Minas Gerais, Brazil

Abstract. In this talk are presented and discussed some aspects related to the adoption of data intensive scalable computing (DISC) paradigm considering the new adoption trend of edge/fog/cloud environments. These contemporaneous scenarios are very relevant for all organizations in a world where billion of IoT and IIoT devices are being connected, and an unprecedent amount of digital data is generated. Therefore, they require special processing and storage.

Resource Management in 5G Cloudified Infrastructure: Design Issues and Challenges

Isaac Woungang

Ryerson University, Toronto, Canada

Abstract. 5G and Beyond (B5G) networks will be featured by a closer collaboration between mobile network operators (MNOs) and cloud service providers (CSPs) to meet the communication and computational requirements of modern mobile applications and services in a mobile cloud computing (MCC) environment. In this talk, we enlighten the marriage between the heterogeneous wireless networks (HetNets) and the multiple clouds (termed as InterCloud) for a better resource management in B5G networks. First, we start with an overview of the building blocks of HetNet and InterCloud, and then we describe the resource managers in both domains. Second, the key design criteria and challenges related to interoperation between the InterCloud and HetNet are described. Third, the state-of the-art security-aware resource allocation mechanisms for a multi-cloud orchestration over a B5G networks are enlighten.

Contents

A Fuzzy-Based System for Determining Driver Stress in VANETs Considering Driving Experience and History

Kevin Bylykbashi[1(✉)], Ermioni Qafzezi[2], Phudit Ampririt[2], Makoto Ikeda[1], Keita Matsuo[1], and Leonard Barolli[1]

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Abstract. We have previously implemented an intelligent system based on fuzzy logic for determining driver's stress in Vehicular Ad hoc Networks (VANETs), called Fuzzy-based System for Determining the Stress Feeling Level (FSDSFL), considering the driver's impatience, the behavior of other drivers, and the traffic condition as input parameters. In this work, we present a modified version of FSDSFL, which considers the driving experience and history as an additional input. We show through simulations the effect that driving experience and history and the other parameters have on the determination of the stress feeling level and demonstrate some actions that can be performed when the stress exceeds certain levels.

1 Introduction

The highly competitive and rapidly advancing autonomous vehicle race has been on for several years now, and it is a matter of time until we have these vehicles on the roads. However, even if the automotive companies do all it takes to create fully automated cars, there will still be one big obstacle, the infrastructure. In addition, this could take decades, even in the most developed countries. Moreover, 93% of the world's fatalities on the roads occur in low- and middle-income countries [11] and considering all these facts, Driver Assistance Systems (DASs) and Vehicular Ad hoc Networks (VANETs) should remain in focus for the foreseeable future.

DASs are intelligent systems that are implemented in vehicles to increase driving safety by assisting drivers and can be very helpful in a variety of situations as they do not depend on the infrastructure as much as driverless vehicles do. Furthermore, DASs can provide driving support with very little cost, thus help the low- and middle-income countries in the long battle against car accidents.

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