

EDITORIAL

The IADIS International Journal on Computer Science and Information Systems (IJCSIS) is a peer-reviewed scientific journal published exclusively in an electronic format. Its mission is to publish original contributions pertaining to the topics of Applied Computer Science, Information Systems and their Applications, to disseminate knowledge amongst its readers and to be a reference publication. The IADIS IJCSIS publishes original research papers and review papers, as well as auxiliary material: short ongoing research papers, case studies, conference reports, management reports, book reviews and commentaries.

This number (ISSN: 1646-3692) gathers 13 selected original papers that bring together research covering the wide spectrum of Computer Science and Information Systems and their applications. The authors' contributions embrace important research topics, namely Bayesian networks, sensor fusion algorithms, Ambient Assisted Living, identity management, Information Sharing, technology deployment in education, GPU, Collision detection algorithms, Sketch-Based Modelling. Also, they intend to provide a current depiction of the research in the field and present their own empirical conclusions while providing ground for future research work.

The first paper in this issue by Hannes Wettig, Petri Kontkanen and Petri Myllymäki (University of Helsinki, Finland) entitled **CALCULATING THE NORMALIZED MAXIMUM LIKELIHOOD DISTRIBUTION FOR BAYESIAN FORESTS** presents a non-informative approach to Bayesian network learning, based on the normalized maximum likelihood (NML) criterion. The NML criterion has some similarities with other previously implemented approaches, but, since it has no explicit need for defined prior distributions, it evades the technical issues of parameter priors. The authors introduce a viable algorithm for computing this criterion designed for Bayesian networks which are tree-structured.

The second paper by Keren Kapach and Yael Edan (Ben-Gurion University of the Negev, Israel) titled **EVALUATION OF GRID-MAP SENSOR FUSION MAPPING ALGORITHMS** evaluates three logical sensor fusion algorithms used in the creation of grid maps for the mapping of a mobile robot's milieu. These sensors: a CCD camera, a set of ultrasonic sensors and a laser rangefinder were compared with an adaptive fuzzy logic algorithm. The outcome of this comparison shows that the adaptive fuzzy logic's performance is superior to logical sensor fusion algorithms.

The third paper by Barnabás Takács (Hungarian Academy of Sciences (MTA SZTAKI), Hungary; Digital Elite, USA; VirMED, Hungary) and Dávid Hanák (Hungarian Academy of Sciences (MTA SZTAKI), Hungary), **A MOBILE SYSTEM FOR ASSISTED LIVING WITH AMBIENT FACIAL INTERFACES** pioneers a mobile solution for Ambient Assisted Living (AAL) created to address the needs of current health services when examining and supporting the elderly population in their own surroundings. The proposed solution encompasses health management, mental observation, mood evaluation as well as diverse physical exercises. In addition to other devices and features, the authors present the Ambient Facial Interfaces (AFI), a methodology to assist the elderly in the monitoring of their personal medication intake or nutritional targets.

The fourth contribution by Mohammad M. R. Chowdhury and Josef Noll (UniK – University Graduate Center, Norway) entitled **INTEGRATED IDENTITY MECHANISM FOR UBIQUITOUS SERVICE ACCESS** underlines the security challenges of the use and possession of different types of identities for accessing remote or proximity services and suggests an architecture that integrates these identities. The authors propose that identities are stored in a distributed way: in the user's personal appliance and in a safe network place. The deployment of multifactor authentication settings addresses diverse degrees of security requirements when accessing services.

The fifth paper by Addisalem Negash, Vasile-Marian Scuturici and Lionel Brunie (Institute National des Sciences Appliquées de Lyon, France) titled **A CONTEXT AWARE INFORMATION SHARING MIDDLEWARE FOR A DYNAMIC PERVASIVE COMPUTING ENVIRONMENT** puts forward an Information Sharing Middleware, SAMi, which can be employed by co-located appliances to exchange data according to the users' environment and their setting. It uses underlying semantic modelling methods and searches files effectively by employing service discovery techniques. By developing a pilot prototype for the simulation of Mobile Ad-hoc NETWORKS (MANET) and the implementation of SAMi, the authors conclude that this middleware has the potential to facilitate the sharing of information amid co-located devices.

The sixth paper by Vladimir Trajkovik, Danco Davcev (University "Ss. Cyril and Methodius", Macedonia) and Slogana Gligorovska (GisData, Macedonia), **MOBILE VIRTUAL BLACKBOARD** presents and assesses the employment of a mobile virtual blackboard in an existing Distance Education System (DES). This virtual blackboard is a mobile communication tool and it can be used for consultation and acquisition of information of immediate use, creating an idyllic setting for collaborative learning. The authors evaluated the viability of its integration in education, through a survey conducted on students, and found that it was feasible and it assisted the development of collaboration in educational settings.

The seventh contribution by Lorraine Fisher (UCD School of Business, Ireland), Michael Callaghan, Jim Harkin and Martin McGinnity (University of Ulster, Northern Ireland) entitled **USING SITUATED LEARNING THEORY TO EXPLORE TABLET PC USE IN ACADEMIC WORK: PERCEPTIONS OF STAFF AND STUDENTS** presents the outcome of an empirical research conducted by the School of Computing and Intelligent System (Magee Campus of the University of Ulster) on university students and staff to evaluate their viewpoint on the use of Tablet Personal Computer (PC). The findings were analysed and interpreted at the light of the situated learning theory and show that while both students and staff have been positively engaged in the School's Tablet PC initiative, its successful integration in the conventional classroom setting still entails numerous transformations.

The eight paper by Maria José Marcelino (Universidade de Coimbra, Portugal) and Carlos Brigas (Instituto Politécnico da Guarda, Portugal), **CUSTOMIZING HANDHELD SIMULATION SCENARIOS WITH A HANDHELD AUTHORING-TOOL** argues that despite the growing popularity of handheld devices in education there isn't much software available in terms of simulation authoring and modelling tools and introduces the Sim-H, an authoring mechanism to be used in handheld modelling and simulation. This system creates and tests models and simulations through direct manipulation methods and multiple representation and interaction structures. It is composed by three editors: modelling, scenario creation and simulation building. The authors focus on describing Handheld Scenario Editor (HSE).

The ninth paper by Thomas Hübner, Yanci Zhang and Renato Pajarola (University of Zurich, Zürich), titled **SINGLE-PASS MULTI-VIEW RENDERING** underlines the main shortcomings of stereo and multi-view display techniques and suggests a system for point splatting, volume rendering and triangle meshes on multi-view auto-stereoscopic displays. This method takes advantage of the programmability of modern graphic processing units (GPUs) for rendering multi-stereo views in a single rendering pass. The authors explain the algorithm they propose in detail and compare it with standard multi-pass rendering approaches.

The tenth contribution by Sergi Grau and Dani Tost (Centre de Recerca de Enginyeria Biomédica, UPC, Spain) entitled **IMAGE-SPACE SHEET-BUFFERED SPLATTING ON THE GPU** introduces an innovative Image-Space Sheet-Buffered (ISSB) Splatting design which generates and administers the buckets on the GPU. A previous GPU design had been suggested, which accelerated the rendering phase, but showed limitations in the computation of the buckets. The method the authors implement has the advantage of being three times quicker in terms of rate frames than prior designs that employ the GPU exclusively in the rendering stage.

The eleventh paper by Nicoletta Adamo-Villani and David Jones (Purdue University, USA) entitled TRAVEL IN IMMERSIVE VIRTUAL LEARNING ENVIRONMENTS: A USER STUDY WITH CHILDREN depicts the progress and assessment of three travel interfaces for immersive settings. These interfaces were created for project SMILE™ (Science and Math in an Immersive Learning Environment), an immersive didactic game for deaf and hearing children, using an imaginary 3D virtual world and involving them with math and science educational tasks. The evaluation of the interfaces compared their use, by children, and tried to appraise hearing children's performance with each of the interfaces to determine which one is most suitable.

The twelfth paper by Joachim Georgii, Jens Krüger and Rüdiger Westermann (Technische Universität München, Germany), INTERACTIVE COLLISION DETECTION FOR DEFORMABLE AND GPU OBJECTS introduces a collision recognition algorithm intended for current and prospect graphics hardware. The algorithm uses the inherent power of GPUs to scan-convert great sets of polygons and to shadow billion of fragments at interactive rates. This paper explains how to locate all likely to collide polygons and pairs through the use of a mipmap hierarchy. The design the authors propose allows the method to be appropriate for situations where geometry is distorted or even produced on the GPU.

The final contribution to this volume by Zuzana Kúkelová (Czech Technical University in Prague, Czech Republic) and Roman Ďurikovič (University of Saint Cyril and Metod Trnava, Slovak Republic) entitled SKETCH-BASED MODELING SYSTEM WITH CONVOLUTION AND VARIATIONAL IMPLICIT SURFACES compares two methods for sketch-based modelling: skeleton-based convolution surfaces and variational implicit surfaces. With this assessment the authors conclude that a blend of both approaches used in different sectors of the shape would produce better results. The system this paper proposes is aimed at reconstructing 3D shapes from silhouettes delineated by users and employs both methods of sketch-based modelling.

These papers illustrate different aspects of research done on Applied Computer Science, Information Systems and their Applications and contribute with the work they've developed to the enrichment of this field. The review of the relevant literature contributes to the theoretical grounding of these areas and the innovative empirical research on different technologies creates opportunity for the development of innovative findings.

The Editors,

Pedro Isaías
Open University, Portugal

Marcin Paprzycki
SWPS, Poland