Welcome to

EUSPN 2021

The 9th International Conference on
Emerging Ubiquitous Systems and
Pervasive Networks

ICTH 2021

The 8th International Conference on
Current and Future Trends of
Information and Communication
Technologies in Healthcare

November 1 – 4, 2021
Leuven, Belgium

With support of

Hasselt University, Belgium & Acadia University, Canada

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EUSPN / ICTH
SYMPOSIA AND WORKSHOPS

EUSPN The 11th International Conference on Emerging Ubiquitous Systems and Pervasive Networks

ICTH The 10th International Conference on Current and Future Trends of Information and Communication Technologies in Healthcare

AATCare The 6th International Workshop on Adults Use of Information and Communication Technologies in Healthcare

BDNT The 6th International workshop on Big Data and Networks

CIM The 4rd International Workshop on Connected & Intelligent Mobility

EICN The 7th International Symposium on Emerging Information, Communication and Networks

HODII International Workshop on Healthcare Open Data, Intelligence and Interoperability

IA&NLP International Workshop on Artificial Intelligence for Natural Language Processing

IWBCS International Workshop on Blockchain Security

IWIT International Workshop on Innovation and Technologies

PROGRAM AT A GLANCE

EUSPN 2021, ICTH 2021 and Workshops
Program Time Slots

Timing		Monday 1 November 2021		
17:00 - 19:00		Registration	Registration Room		
			ROOM 1	ROOM 2	ROOM 3
			Erasmus 1	Erasmus 2	Erasmus 3

Timing		Tuesday 2 November 2021		
Starts 08:30		Registration	Registration Room		
09:00 - 09:30		Opening Ceremony	Erasmus 1		
09:30 - 11:00		Technical Sessions (1)	EUSPN–S1	ICTH–S1	BDNT
11:00 - 11:25		Coffee Break	Meeting Foyer		
11:30 - 12:30		Keynote Speaker I	Prof. Dr. Danny Hughes		
12:30 - 13:25		LUNCH	Lunch Room (Restaurant)		
13:30 - 15:00		Technical Sessions (2)	EUSPN–S2	ICTH–S2	EICN
15:00 - 15:25		Coffee Break	Meeting Foyer		
15:30 - 17:30		Technical Sessions (3)	EUSPN–S3	ICTH–S3/AATCare	IA&NLP

Timing		Wednesday 3 November 2021		
Starts 09:00		Registration	Conference Desk		
09:30 - 11:00		Technical Sessions (4)	EUSPN–S4	ICTH–S4	IWIT
11:00 - 11:25		Coffee Break	Meeting Foyer		
11:30 - 12:00					
12:00 - 13:25		LUNCH	Lunch Room (Restaurant)		
13:30 - 15:00		Technical Sessions (5)	EUSPN–S5	EUSPN–S6	HODII–S1
15:00 - 15:25		Coffee Break	Meeting Foyer		
15:30 - 17:30		Technical Sessions (6)	EUSPN–S7	EUSPN–S8	DUDE
19:00 - 21:00		Banquet and Award Ceremony	Banquet Room		

Timing		Thursday 4 November 2021		
08:30 - 10:00		Technical Sessions (7)	EUSPN–S9	CIM/EICN	IWBCS
		Coffee Break	Meeting Foyer		
		End of Event			

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KEYNOTE I

Self adaptive Software Systems are Essential for the Internet of Things

Prof. Danny Hughes
CTO VersaSense, Belgium

Abstract

The Internet of Things is composed of tiny computers equipped with sensors, actuators and low power radios that are embedded in our physical environment. The number of Internet of Things devices is growing dramatically. Gartner predicts that by 2020 there will be over 20 billion deployed internet of things devices. By bridging the physical and digital worlds, the Internet of Things will enable radical efficiency gains across a wide range of industries. This talk will argue that self-adaptive software is essential to achieving the IoT vision. My talk will be illustrated throughout by real-world examples of the demand for self-adaptation in the Internet of Things, as drawn from my experiences as the Chief Technical Officer of VersaSense, an industrial Internet of Things company and spin-off of KU Leuven.

About the Speaker:

Prof. Danny Hughes is the Chief Technical Officer (CTO) of VersaSense, the creators of the world's first true plug-and-play Internet of Things platform. He is also a Professor with the Department of Computer Science at KU Leuven (Belgium), where he leads the Networked Embedded Software task force. Danny holds a PhD from Lancaster University (UK) and has since worked at the University of California at Berkeley (USA), the University of Sao Paulo (Brazil) and at Xi'an Jiaotong-Liverpool University (China). His research focuses on developing and securing the complete Internet of Things (IoT) software stack.

DETAILED PROGRAM

Monday, November 1, 2021

Registration　　　　　　　　　　**16:00-18:00**

Room: Registration Room

Tuesday, November 2, 2021

Registration　　　　　**08:45 – 9:15 & 10:30 – 12:30**

Room: Registration Room

Opening　　　　　　　　　　**09:15 - 10:30**

Opening Ceremony
Room: Main Meeting Room

Keynote I

Self adaptive software systems are essential for the Internet of Things
Prof. Danny Hughes, CTO VersaSense, Belgium

Session Chair: Ansar Yasar, Hasselt University, Belgium
Room: Main Meeting Room

Coffee Break　　　　　　　　**10:30 - 10:55**

Room: Meeting Foyer

Technical Sessions (1)　　　　　**11:00 - 12:30**

EUSPN Session S-1: Adaptive Systems, Intelligent Computing and Applications
Session Chair: Krishnamurthy Vidyasankar, Memorial University, Canada
Room: Room 1

A Prediction Model of Electric Vehicle Charging Requests
　Ahmed Nait-Sidi-Moh, Azizbek Ruzmetov, Mohamed Bakhouya, Naitmalek Youssef and Jaafar Gaber
A Hybrid GPU-FPGA-based Computing Platform for Machine Learning
　Xu Liu, Hibat Allah Ounifi, Abdelouahed Gherbi, Yves Lemieux and Wubin Li
A High Performance Search Algorithm for Job-Shop Scheduling Problem
　Shao-Juan Wang, Chun-Wei Tsai and Ming-Chao Chiang
An Approach for QoS-aware Service Composition with GraphPlan and Fuzzy Logic
　Ming Zhu, Guodong Fan, Jing Li and Olga Ormandjieva

ICTH Session S-1
Session Chair: Johan Holmgren, Malmö University, Sweden
Room: Room 2

Parallel software architecture for the next generation of glucose monitoring
　Tomas Koutny and Martin Ubl
Air Quality based Informational Intervention Framework to Promote Healthy and Active School Travel
　Shiraz Ahmed, Muhammad Adnan, Davy Janssens, Ansar-Ul-Haque Yasar and Geert Wets
Fall Detection System by Machine Learning Framework for Public Health
　Thiago Braga Rodrigues, Débora Pereira Salgado, Mauricio Costa Cordeiro, Katja Magdalena Osterwald,
　Teodiano F. B. Filho, Vicente F. de Lucena Jr, Eduardo L.M. Naves and Niall Murray
Classification of SmartestMentalTech Services and Application for Comprehensive Stepped-Care Model: Health
Psychological Approach
　Seomi Kyeong Ah Lee

auICTH Workshop
Session Chair: Heiko Gewald and Philipp Brune, The Neu-Ulm University of Applied Sciences, Germany
Room: Room 3

Return of the JS: Towards a Node.js-Based Software Architecture For Combined CMS/CRM Applications
Fabian Kaimer and Philipp Brune
Grandma's New Tablet – The Role of Mobile Devices in Trying to Innovate in IT
Maximilian Haug, Heiko Gewald and Robert Rockmann
An Experimental Protocol to Support Cognitive Impairment Diagnosis by using Handwriting Analysis
Nicole Dalia Cilia, Claudio De Stefano, Francesco Fontanella and Alessandra Scotto di Freca
How can technology enhance elderly adherence to self-managed treatment plan?
Karoly Bozan and Heiko Gewald

Lunch Break   **12:30 - 13:25**

Room: Meeting Foyer

Technical Sessions (2)   **13:30 - 15:00**

EUSPN Session S-2: Big Data and Big Data Science I
Session Chair: Manuele Kirsch-Pinheiro, Université Paris 1 - Panthéon Sorbonne, France
Room: Room 1

Improving Data Locality in P2P-based Fog Computing Platforms
Luiz Angelo Steffenel and Manuele Kirsch-Pinheiro
Hybrid Technique for Arrival Rate Extraction and Size Reduction using Singular Spectrum Analysis and Fourier Series
Ahmad Hammoudeh, Mohammad Al Saaideh and Ghazi Al-Naymat
Cloud Platform using Big Data and HPC Technologies for Distributed and Parallels Treatments A Patient Identity
Olivier Debauche, Sidi Ahmed Mahmoudi, Saïd Mahmoudi and Pierre Manneback
Big Data and Time Series Use In Short Term Load Forecasting In Power Transmission System
Arbër Perçuku, Daniela Minkovska and Lyudmila Stoyanova

ICTH Session S-2
Session Chair: Ali Al-Badi, Sultan Qaboos University, Oman
Room: Room 2

Optimal placement of Mobile Stroke Units considering the perspectives of equality and efficiency
Oliver Dahllöf, Felix Hofwimmer, Johan Holmgren and Jesper Petersson
Linking Health Web Services as Resource Graph by Semantic REST Resource Tagging
Cong Peng, Prashant Goswami and Guohua Bai
Red blood cell segmentation by thresholding and using a Canny detector
Fatimah Al-Hafiz, Shiroq Al-Megren and Heba Kurdi
SOULMATE - Secure Old people's Ultimate Lifestyle Mobility by offering Augmented reality Training Experiences
An Neven, Tom Bellemans, Astrid Kemperman, Pauline van den Berg, Martijn Kiers, Lex van Velsen, Judith Urlings, Davy Janssens and Yves Vanrompay

EICN-S1/CIM Workshops
Session Chair: Elhadi Shakshuki, Acadia University, Canada
Room: Room 3

An Effective Search Algorithm for Hyper-Dense Deployment Problem of 5G
Shi-Jui Liu and Chun-Wei Tsai
EERP: An Enhanced Eigentrust Algorithm for Reputation Management in Peer to Peer Network
Alanoud Alhussain and Heba Kurdi
Visualizations Serendipity for User Controlled Recommender System for Learning
Ahmad Hassan Afridi
Estimating meteorological visibility range under foggy weather conditions: A deep learning approach
Hazar Chaabani, Naoufel Werghi, Faouzi Kamoun, Bilal Taha, Fatma Outay, Ansar-Ul-Haque Yasar

Coffee Break   **15:00 - 15:25**

Room: Meeting Foyer

Technical Sessions (3)   15:30 - 17:30

EUSPN Session S-3: Internet of Things
Session Chair: Luiz Angelo Steffenel, Université de Reims Champagne-Ardenne, France
Room: Room 1

Consistency of Continuous Queries in Fog Computing
Krishnamurthy Vidyasankar
An Improved Energy Efficient Duty Cycling Algorithm for IoT based Precision Agriculture
Himanshu Agrawal and Ruchi Dhall
Ontology for Academic Context Reasoning
Maricela Bravo, José A. Reyes-Ortiz, Isabel Cruz-Ruiz, Ariadna Gutiérrez-Rosales and Josué Padilla-Cuevas
Towards Security on Internet of Things: Applications and Challenges in Technology
Kazi Masum Sadique, Rahim Rahmani and Paul Johannesson
Adaptive Packet Scheduling in IoT environment Based on Q-learning
Donghyun Kim, Sejun Kim, Byungjun Lee and Hee Yong Youn

ICTH Session S-3
Session Chair: Fatma Outay, Zayed University, UAE
Room: Room 3

Teleoperation Training Environment for New Users of Electric Powered Wheelchair
Yuri Silva, Vinicius Souza, Eduardo Naves, Teodiano Bastos Filho and Vicente Lucena Jr.
Risk Evaluation Method for Range of Motion after Total Hip Arthroplasty applying Monte-Carlo Simulation
Gisun Jung, Young Kim, Nokhaiz Tariq Khan and Yun Bae Kim
Security model for Big Healthcare Data Lifecycle
Hayat Khaloufi, Abderrahim Beni-Hssane, Karim Abouelmehdi and Mostafa Saadi

EICN-S2/SPFC2 Workshops
Session Chair: Rui Neves Madeira, University of Lisboa, Portugal
Room: Room 3

Research Directions for Digital Signage Systems in Retail
Christine Bauer, Marion Garaus, Christine Strauss and Udo Wagner
Group affiliation detection in a challenging environment
Håkan Jonsson, Pierre Nugues
CS-IBE : A Data Confidentiality System in Public Cloud Storage System
Ahmed Bentajer, Hedabou Mustapha, Karim Abouelmehdi and Said Elfezazi
Predicting Hospital Readmission among Diabetics using Deep Learning
Ahmad Hammoudeh, Ghazi Al-Naymat, Ibrahim Ghannam and Nadim Obied

End of Tuesday Technical Sessions

Coffee Break   **10:30 - 10:55**

Room: Meeting Foyer

Technical Sessions (4)   **11:00 - 12:30**

EUSPN Session S-4: Emerging Pervasive/Ubiquitous Technologies
Session Chair: Esam Qaralleh, Higher Colleges for Technology, UAE
Room: Room 1

Multi-UAV Task Allocation Algorithm to Combat the Red Palm Weevil
    Shiroq Al-Megren, Munirah F. Aldaood and Heba Kurdi
A Practical Sensors Software to Manage Fault Signals' Impact
    Slimane Ouhmad, Abderrahim Beni-Hssane and Abdelmajid Hajami
3iVClass: a new classification method for Virtual, Augmented and Mixed Realities
    Marc Parveau and Mehdi Adda
A step loss function based SVM classifier for binary classification
    Mahmud Mansour, Fethi Jarray, Sabri Boughorbel and Ghassen Tlig

ICTH Session S-4
Session Chair: Ming Zhu, Shandong University of Technology, China
Room: Room 2

MobiHealth: a System to Improve Medication Adherence in Hypertensive Patients
    Vandermi Silva, Vicente Ferreira De Lucena Jr, Vinicius Souza and Robson Cruz
Mobile Hardware Based Implementation of a Novel, Efficient, Fuzzy Logic Inspired Edge Detection Technique for
Analysis of Malaria Infected Microscopic Thin Blood Images
    Stephen Bias, Saumya Reni and Izzet Kale
A training simulation for practicing shared decision making for older patients
    Ruth Pel-Littel, Henk van Zeijts, Nadine Schram, Henk Herman Nap and Johan Jeuring
Hardware Implementation of Modified Annular Ring Ratio for Blood Cell Detection in Thin Blood Smear Images
    Alexandre Stecowiat, Saumya Kareem Reni and Izzet Kale

HiPIS Workshop S-1
Session Chair: Filipe Portela and Manuel Filipe Santos, University of Minho, Portugal
Room: Room 3

Step Towards Progressive Web Development in Obstetrics
    Patrícia Loreto, Jorge Braga, Hugo Peixoto, José Machado and António Abelha
Efficient Enriching of Synthesized Relational Patient Data with Time Series Data
    Simon Schiff, Marcel Gehrke and Ralf Möller
Deep Learning Based Pipeline for Fingerprinting Using Brain Functional MRI Connectivity Data
    Nicolas Lori, Ivo Ramalhosa, Paulo Marques and Victor Alves

Lunch   **12:30 - 13:25**

Room: Meeting Foyer

Technical Sessions (5)   13:30 - 15:00

EUSPN Session S-5: Mobile Computing and Wireless Communications
Session Chair: Tarek Sheltami, KFUPM University, Saudi Arabia
Room: Room 1

Supporting Node Connectivity with Dixon's Test for ZigBee-based WSN
   Seungeon Yoo, Cheng Wang, Kyung Tae Kim, Sejun Kim and Hee Yong Youn
An Approach towards Service System Building for Road Trac Signs Detection and Recognition
   Natalia Kryvinska and Aneta Poniszewska-Maranda
KaliGreen: A distributed Scheduler for Energy Saving
   Hernán Humberto Álvarez Valera, Philippe Roose, Marc Dalmau, Christina Herzog and Kyle Respicio
One the V2X speed synchronization at intersections: Rules based system for extended virtual platooning
   Wendan Du, Abdeljalil Abbas-Turki, Abderrafiaa Koukam, Stéphane Galland and Franck Gechter

ICTH Session S-5
Session Chair: Francesco Fontanella, University di Cassino e del Lazio Meridionale, Italy
Room: Room 2

Vision and Voice in eConsent: Future Trends for Health Social Networks
   Yvonne O'Connor, Wendy Rowan and Ciara Heavin
An agent-based simulation model for assessment of prehospital triage policies concerning destination of stroke patients
   Jabir Al Fatah, Ala'A Alshaban, Johan Holmgren and Jesper Petersson
Memory Improvement Tool for Dementia Alzheimer's Patients
   *Kahandawa Arachchige Dona Chathurangika Padmakumari Kahandawaarachchi, Dona Shanilka Deshani
   Weerakoon, Jayathilaka Dissanayakalage Suneelaka Yasith Dissanayake, Welideniayage Prasansanee Madhushika
   Thilakasiri and Wadduwage Don Malaka Buddhimal Shanthakumara*
A Fuzzy based Diagnostic Agent for Context Aware Patient Monitoring
   Tshegofatso Magano, Karim Djouani, Abdelghani Chibani and Anish Kurien

AATCare/PSCare Workshops
Session Chair: Yun Bae Kim, Sungkyunkwan University, Korea Republic
Room: Room 3

The Kullback-Leibler Divergence Used in Machine Learning Algorithms for Health Care Applications and Hypertension
Prediction: A Literature Review
   Antonio CLIM, Răzvan Daniel ZOTA, Grigore TINICĂ
Comparison Study of Digital Forensics Analysis Techniques; Findings versus Resources
   Ayman Shaaban and Nashwa Abdelbaki
Enhanced Approach to Detect Malicious VBScript files Based on Data Mining Techniques
   Doaa Wael, Samir G. Sayed, Nashwa AbdelBaki

Coffee Break   15:00 - 15:25

Room: Meeting Foyer

Technical Sessions (6)   15:30 - 17:30

EUSPN Session S-6: Security, Privacy, and Trust
Session Chair: Natalia Kryvinska, University of Vienna, Austria
Room: Room 1

Detecting fake news in social media networks
    Monther Aldwairi and Ali Alwahedi
Design and Implementation of an End-to-End Web based Trusted Email System
    M Zeeshan Sabir and Muhammad Yousaf
Towards the intelligent agents for blockchain e-voting system
    Aneta Poniszewska-Maranda
A Detection and Prevention Technique for Man in the Middle Attack in Fog Computing
    Farouq Aliyu, Tarek Sheltami and Elhadi Shakshuki

ICTH Session S-6
Session Chair: Vicente Lucena, Federal University of Amazonas, Brazil
Room: Room 2

Interaction techniques for a neural-guided hand exoskeleton
    Tobias Ableitner, Surjo Soekadar, Andreas Schilling, Gottfried Zimmermann and Christophe Strobbe
Personalizing the User Experience of a Mobile Health Application towards Patient Engagement
    Rui Madeira, Patrícia Macedo and Helena Germano
Design of a feedback intervention to increase travel related physical activity of cardiac patients
    Tooba Batool, Luk Knapen, Yves Vanrompay, An Neven, Kris Brijs, Veerle Ross, Paul Dendale, Davy Jansses and Geert Wets

HiPIS Workshop S-2
Session Chair: Filipe Portela, Manuel Filipe Santos, University of Minho, Portugal
Room: Room 3

Improving Pervasive Decision Support System in Critical Care using Technology Acceptance Model
    Ana Nunes, Filipe Portela and Manuel Filipe Santos
Introduction to BPM approach in Healthcare and Case Study of End User Interaction with EHR Interface
    João Gomes, Filipe Portela and Manuel Filipe Santos

End of Wednesday Technical Sessions

Banquet and Award Ceremony   19:00-21:00

Banquet Room

Thursday, November 4, 2021

Technical Sessions (7)   **08:30 – 10:00**

EUSPN Session S-7: Big Data and Big Data Science II
Session Chair: Ansar Yasar, Hasselt University, Belgium
Room: Room 1

Model-based Approach to Data Center Design and Power Usage Effectiveness Assessment
  Hibat Allah Ounifi, Xu Liu, Abdelouahed Gherbi, Yves Lemieux and Wubin Li
Exploring Big Data Governance Frameworks
  Ali Al-Badi, Ali Tarhini, Asharul Islam Khan
A Large-Scale Sentiment Data Classification for Online Reviews Under Apache Spark
  Samar Al-Saqqa, Ghazi Al-Naymat and Arafat Awajan

EUSPN Session S-8: Emerging Systems
Session Chair: Elhadi Shakshuki, Acadia University, Canada
Room: Room 1

Modeling and Verification of Response Time of QoS-aware Web Service Composition by Timed CSP
  Ming Zhu, Jing Li, Olga Ormandjievaand Guodong Fan
Multi-tier Blockchain Framework for IoT-EHRs Systems
  Shaimaa Badr, Ibrahim Gomaa and Emad Adb-Elrahman
Reconfigurable Hardware-Friendly Early Termination Mechanism in Motion Estimation for HEVC
  Esam Alqaralleh, Yazan Alqudah and Belal Sababha
Improved Handover Decision Algorithm Using Multiple Criteria
  Radhwan Mohamed Abdullah, Ali Alwan and Abedallah Zaid Abualkishik

END of Event