University of Larbi Ben M'hidi, Oum El Bouaghi

International Training Days of Science and Engineering ITDSE 2019, Algeria

Advanced applied science and technology for the advancement of society

ITDSE 2019
International Training Days of Science and Engineering

Institute of science and applied techniques, Ain M'lila

15 December 15 – 17 2019

International Training Days of Science and Engineering

Algeria (ITDSE) 2019

December 15-17, 2019 - ISTA, Ain M'lila | Algeria

Advanced applied science and technology for the advancement of society

The International Training Days of Science and Engineering (ITDSEA'19) will be held in the institute of science and applied technics, of the University Larbi ben M'hidi of oum el bouaghi, Algeria, on December 15 – 17, 2019.

This program has several topics:

- FPGA (Field Programmable Gate Array),
- Embedded systems in IoT and Mechatronics,
- Real time Operating Systems and Robotics
- System Engineering.

It is expected to provide researchers, lecturers, engineers, and scientists the opportunity to interact and present their latest advanced research under Poster form. Authors are solicited to contribute to the Training Days by submitting Poster that illustrate research results, projects, examine works, and industrial experiences.

Sponsors

In celebration of the opening of the institute of science and applied technics of Ain M'lila, this Training Days will bring world renown technologists from the US to provide a state-of-the-art overview of advanced technologies. And in recognition of its importance, It is being co-sponsored by the IEEE Section 1 USA.

IEEE
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IEEE Co-sponsor
Section 1, USA

University affiliations Support:

Massachusetts Institute of Technology, USA

Fairleigh Dickinson University, USA

The State University of New Jersey, USA

New Jersey Institute of Technology, USA

Industry support

AuresTech Inc., USA

American Polytechnic Institute, USA

Beghou Consulting, USA

Topics

This program has several topics:

Topic 1: Microcontroller and their role in Internet of Things (IoT),

Abstract

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-

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to-computer interaction. It is estimated that there will be more than 20 billion IoT devices connected in the next decade. This workshop uses hands-on examples to show the working of an embedded processor and its function in the IoT. The ESP32 board from Espressif is used for this workshop. The chip includes Wi-Fi and Bluetooth capabilities. During the workshop the chip architecture and capabilities will be explained. Also, an introduction to Arduino language, which will be used to program the chip, will be also be provided. During the workshop detailed and step by step hands-on experiments will be presented. The experiments will introduce the attendees to IoT technology and how it is applied in real world.

Topic 2: FPGAs technologies and their application Configurable computing

Abstract

Over the last 30 years FPGA design applications have increased exponentially. They have moved from designs only involving digital logic to other areas such as embedded controllers, Digital Signal Processing, communication, and configurable computing. The Xilinx Zynq FPGA family is a perfect example of how far FPGA's have come, providing plenty of FPGA fabric and two embedded ARM hard cores that can implement a full blown Linux Operating System. This has made exposure to and mastering of FPGAs very important to many people in the industry and academia. It utilizes a mixture of theory and hands on laboratories to give students what they need to know in VHDL programming, simulation and implementation of multi-disciplinary applications targeting FPGAs. Labs and homework are provided to reinforce the key concepts.

Topic 3: Real Time Operation System (RTOS): A hands on approach

Abstract

A real-time operating system (RTOS) is an operating system (OS) intended to serve real-time applications that process data as it comes in, typically less than tenths of seconds or shorter increments of time. They either are event driven or time sharing. Event driven systems switch

between tasks based on their priorities while time sharing systems switch the task based on clock interrupts. Most RTOSs use a pre-emptive scheduling algorithm. RTOS are found in critical system as critical process controls, aviation and others. This talk provides an overview of a RTOS architecture. It uses a ARM32 board to demonstrate application design, development and debugging.

Topic 4: Model-based And Mechatronics System Engineering

Abstract

Model-based System Engineering (MBSE) is multi-disciplinary, distributed system engineering and based on a model-centric engineering methodology instead of the traditional document-centric methodology. MBSE encompasses behavioral analysis, system architecture, requirement traceability, performance analysis, modeling and simulation, verification and validation for the architecture and development of complex systems of systems (SoS) throughout its life cycle. Mechatronics Systems Engineering: Mechatronics will be defined as multidisciplinary systems engineering and its applications discussed. The mechatronics design methodology as the optimal methodology in modern engineering design will be discussed. This will be followed by case studies on mechatronic systems design.

Trainers

These trainings and activities will be provided by four great researchers coming from USA:

Dr. Mohammed Rachedine's experience extends over 30 years and includes academia, corporate as well as government. Currently, he is a primary patent examiner at the US Patent and Trademark Office (USPTO). Before joining the USPTO, he worked at Motorola then at Freescale Semiconductor Inc. designing, testing and evaluating integrated transceivers for cellular phones. Prior to joining Motorola, he taught Electrical Engineering at Hampton University. Mohammed Rachedine holds a Ph.D. in Electrical Engineering, authored several professional papers as well as patents.

Prof. Cherif Chibane is a Lecturer, Research Scientist, Technologist and Entrepreneurs with more than 30 years of experience in advanced technology development for NASA, DARPA and major government laboratories in the US. He is currently the founder and chief scientist of AuresTech, which performs research for the aerospace industry in the US.

Previously, he was a research scientist at MIT - Lincoln Laboratory and Draper Laboratory where he led research in advanced space communications, guidance and navigation. He was one of the early adaptors of FPGA processing and his research now includes the application of configurable computing to Artificial Intelligence (AI) and Machine Learning (ML). He is a former adjunct professor at Fairleigh Dickinson University where he lectured on advanced engineering topics and mentored and advised students at the undergraduate and graduate levels.
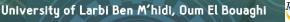
Prof. Said Belhadj has more than 30 years of experience in hardware and software for state-of-the-art application. He is currently a system lead for critical system for NASA in the USA. This involved embedded H/W and S/W systems that requires the highest reliability. He is an expert in technology analysis and development. Prof. Belhadj is thought guru, philosopher and a thinker.

Prof. Salah Badjou has a PhD in physics from Northeastern University, Boston, Massachusetts. He taught physics at two universities and electromechanical engineering for for teen years at Wentworth Institute of Technology, Boston. His research interests are applied physics, biomedical and renewable energy engineering. He is currently co-principal at American Polytechnic Institute.

Honorary General Chair

- Prof. Zohir Dibi Rector of Univ. Oum El Bouaghi, Algeria

Director of the days

- Prof. Mourad ZAABAT Director of ISTA, Univ. Oum El Bouaghi, Algeria

Chairman scientific committee

- Prof. Abdelbaki Djouambi, Univ. Oum El Bouaghi, Algeria

Responsible for the organization committee

- Dr. Fateh MOULAHCENE and Mr. Ammar MERAZGA, Univ. Oum El Bouaghi, Algeria

Organization Committee

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- Mr. Mohammed BEDROUNI, International Start up consultant, USA

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- Dr. Skander BENSEGUENI, National Polytechnic School - ENP Constantine, Algeria

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- Dr. Fateh Moulehcene, Univ. Oum el bouaghi, Algeria

- Dr. Djamel Sakri, Univ. Oum el bouaghi, Algeria

- Dr. Mounir Aksas, Univ. Of Batna 1, Algeria

- Dr. A-Moumen Darcherif, Univ. Paris Seine, France

- Dr. Djemai Kebbal, University Paul Sabatier, Toulouse, France

- Prof. Kamal Youcef Toumi, Massachusetts Institute of Technology, USA

- Prof. Fredric Joel Harris, University Of California San Diego, USA

- Prof. Mohamed Zatet, Suffolk University USA

- Prof. Mostapha Ziad, Suffolk University USA

- Prof. Said Belhadj, NASA, USA

- Prof. Cherif Chibane, Fairleigh Dickinson University, USA

- Prof. Salah Badjou, American Polytechnic Institute, USA

- Dr. Sam Nazari, Northeastern University, USA

- Dr. Mohammed Rachedine, Freescale Semiconductor, Lake Zurich IL, USA

- Dr. Abdelkrim Doufene, Massachusetts Institute of Technology, Cambridge, USA

Program

Day 1, courses with practical examples & practical application

Sunday, December 15, 2019	08:00 to 09:30	09:30 to12:30	
	Registration and opening of the ITDSE 2019	**Course**	Microcontroller and their role in Internet of Things (IoT)
		Break coffee - **10h30 à 10h45**	
	12:30 to 14:00	14:00 to18:00	
	Lunch	**Course**	FPGAs Technologies and their Application Configurable Computing
		Practical Application	Microcontroller and their role in Internet of Things (IoT)
		Break coffee - **16h00 à 16h15**	

Day 2, courses with practical examples & practical application

Monday, December 16, 2019	08:00 to 12:15	
	Course	Real Time Operation System (RTOS) : A hands on Approach
	Practical Application	FPGAs Technologies and their Application Configurable Computing
	Break coffee - **10h00 à 10h15**	
	12:30 to 14:00	14:00 to18:00
	Lunch	**Course** — Model based and Mechatronics System Engineering
		Practical Application — Real Time Operation System (RTOS) : A hands on Approach
		Break coffee - **16h00 à 16h15**

Day 3, program

Tuesday, December 17, 2019		
	08:00 to 08:20	**Opening Remarks**
	08:20 to 09:20	Plenary session – Pr Cherif Chibane and Mohammed Badrouni
	09:20 to 10:20	IP and their Importance in the Knowledge Economy
	10:20 to 12:20	Students Project/Demonstration, Winner Prize : IEEE Membership and Poster Session
	12:20 to 14:00	**Lunch**
	14:00 to 16:00	Panel discussions: What role should the Algerian University have in the Society?
	16:00 to 16:20	Students awards
	16:20 to 17:00	**Closing remarks**

Poster Submission Guidelines

Key dates

- **Poster Submission Open : October 13, 2019**
- **Poster Submission deadline : ~~November 13, 2019~~ November 30, 2019**
- **Poster Notification : ~~December 1, 2019~~ December 7, 2019**

Registration

Registration Details

The ITDSE'19 registration fees are as follows:

- Student Participants............... Free
- Regular Participants .... 3500 DA
- Industrial Participants............5000 DA

Registration fees include:

1. Participation in the Technical Program
2. Notebook / Pen / Badges/Bag
3. Four Lunchs
4. Coffee Breaks
5. Possibility of accommodation assistance (price reduction).
6. Participants Certificate

Venue

The ITDSE'19 will be held at Institute of science and applied technics located in AIN M'LILA.

Aïn M'lila is a city in northeastern Algeria, a large commercial center, in a plain of fertile lands, surrounded by mountains like Djebel Guerrioun, (1729 m) to the east and Djebel Fortas (1477 m) to the north east, the Nif Ennser (1540 m) to the south west, the Jebel Meimane to the north-west (1160 m) and Arkane, Taywalt, ... which belong to the mountains of Aurès in the form of a bowl between these mountains, region marshy and waterlogged before colonization and during the Ottoman period. It's the birthplace of the hero of the revolution in Algeria: Mohamed Larbi Ben M'hidi.

Registration

Institute of science and applied technics,

University Larbi ben M'hidi of Oum El Bouaghi, Algeria

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