UNIVERSITY OF ORADEA
FACULTY OF ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATIONS
&
"POLITEHNICA" UNIVERSITY OF BUCHAREST
FACULTY OF ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY
CENTER FOR TECHNOLOGICAL ELECTRONICS AND INTERCONNECTION TECHNIQUES

INTERCONNECTION TECHNIQUES IN ELECTRONICS

International Student Professional Contest

The 24th Edition, Oradea, 22-25 April 2015

Final Program

the 24th Edition

Promoted by IEEE CPMT HU&RO Joint Chapter

TIE Event Program

Editors:
Prof. Dan Pitică, Ph. D.
Assist. Prof. Rajmond Jánó, Ph. D.

DESIGN OF ELECTRONIC MODULES & ASSEMBLIES

A WAY to turn your HOBBY into a PROFESSION

www.tie.ro

Student Professional Contest
The 24th Edition, Oradea, April 22 - 25, 2015

Organized by:

UNIVERSITY OF ORADEA
https://www.uoradea.ro

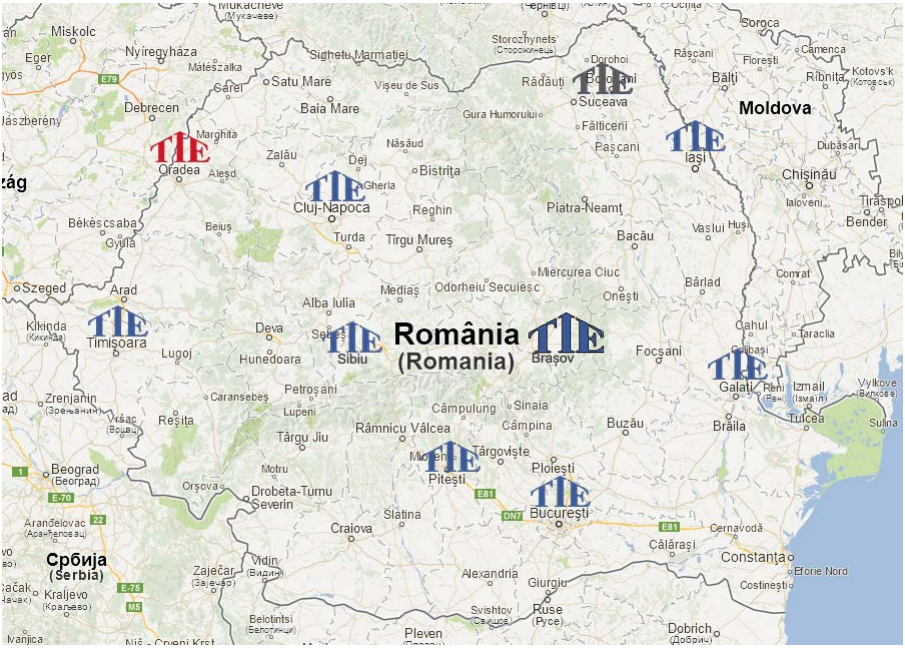
"POLITEHNICA" UNIVERSITY OF BUCHAREST
http://www.upb.ro
Center for Technological Electronics and Interconnection Techniques
http://www.cetti.ro

Association for Promoting Electronic Technology APTE
http://www.apte.org.ro

and supported by:

EPETRUN (Electronic Packaging Education Training and research Network)

TIE Past, Present and Future Editions



1992-2002	"Politehnica" University of Bucharest
2003	"Politehnica" University of Timişoara
2004	Technical University of Cluj-Napoca
2005	"Gh. Asachi" Technical University, Iaşi
2006	"Politehnica" University of Bucharest
2007	"Ştefan cel Mare" University of Suceava
2008	University of Piteşti
2009	"Dunărea de Jos" University of Galaţi
2010	Technical University of Cluj-Napoca
2011	"Politehnica" University of Bucharest
2012	"Lucian Blaga" University of Sibiu
2013	"Transilvania" University of Braşov
2014	"Politehnica" University of Timişoara
2015	**University of Oradea**
2016	"Ştefan cel Mare" University of Suceava

Dear participants and guests,

I'm pleased and honored, on behalf of the local organizing committee, to welcome you all to University of Oradea, for the 24th Edition of TIE contest.

Oradea is a north-west border Romanian city, a multicultural town which is highly appreciated by the different ethnic groups living on the banks of the Crişul Repede River. Because the Romanian industry must cope with a fierce global competition, Oradea City Hall developed the Euro Business Industrial Park containing some important companies involved in electronic industry and manufacturing.

University of Oradea is aware that a very important target in near future is to develop a network that promotes the development of human resources for innovation. So, the Electronics and Telecommunication Department is deeply involved in developing a strong connection between industry and technical academic courses and has a growing interest for electronic packaging.

Our local organizing committee is confident that TIE 2015 will be a chance for companies involved in electronics industry and Romanian technical academic schools to unite their interests and activities.

We wish all TIE 2015 participants a very pleasant and successful attendance!

Welcome to Oradea!

Prof. Cornelia GORDAN, Ph.D.
TIE 2015 Event Director
University of Oradea, Romania

Previous TIE Winners

Year	Name	University
2014	Grigoraş Eduard	"Ştefan cel Mare" University of Suceava
2013	Bostan Adrian	"Politehnica" University of Bucharest
2012	Aldea Alin	University of Piteşti
2011	Precup Călin	"Politehnica" University of Timişoara
2010	Dungă Tudor Dan	"Politehnica" University of Timişoara
2009	Răducanu Bogdan	"Politehnica" University of Bucharest
2008	Oşan Adrian	"Politehnica" University of Timişoara
2007	Tamaş Cosmin Andrei	"Politehnica" University of Bucharest
2006	Moscalu Dragoş	"Gh.Asachi" Technical University Iaşi
2005	Andreiciuc Adrian	"Politehnica" University of Timişoara
2004	Berceanu Cristian	"Politehnica" University of Timişoara
2003	Munteanu George	"Politehnica" University of Bucharest
2002	Rangu Marius	"Politehnica" University of Timişoara
2001	Toma Corneliu	"Politehnica" University of Bucharest
2000	Vlad Andrei	"Politehnica" University of Bucharest
1999	Savu Mihai	"Politehnica" University of Bucharest
1998	Alexandrescu Dan	"Politehnica" University of Bucharest
1997	Gavrilaş Cristian	"Politehnica" University of Bucharest
1996	Vintilă Mihai	"Politehnica" University of Bucharest
1995	Ştefan Marius Sorin	"Politehnica" University of Bucharest
1994	Bucioc Mihai	"Politehnica" University of Bucharest
1993	Teodorescu Tudor	"Politehnica" University of Bucharest
1992	Teodorescu Tudor	"Politehnica" University of Bucharest

TIE 2015

The 24th edition of TIE takes place under a strong industrial "umbrella". More and more electronics industry companies, which are present in this part of Europe, are interested to support, technically and financially, this event. After more than two decades of continuous, yearly, presence of TIE, the event has become a well known brand for quality of education and training at academia level for students interested in CAD of Printed Circuit Boards (PCB). Thanks to the gained knowledge, the young engineers, after graduation, are perfectly suitable to be employed by companies and involved in the development of innovative electronic products.

Looking to the industrial landscape of our country, it is obvious by that the interest of the investors to invest in electronics companies has increased. Not only companies interested in development of integrated circuits are present - Freescale, Infineon, Microchip or ON-Semiconductor have already a long experience in this region - but also more and more companies developing electronic modules are present. Today there are active, in the electronics industry, well-known companies as Continental Automotive, Celestica, Siemens, Plexus, Hella, Yazaki, Connectronics, Flextronics and many others. It is necessary to mention that, not a long time ago, the Bosch Company has started an important investment in the same field of automotive electronics, and the examples can to continue. Probably, thanks to TIE, the mentioned companies have access to a well-trained pool of electronics engineers with very good theoretical background, including PCB design knowledge.

In the last period, electronics has become a huge field for innovation. Microelectronics and nanoelectronics are today's runners for plenty of products characterized by: "smart", small, and more and more complex. For all these products, the interconnection structure of the electronic components plays an important role. Contrary to all the other electronic components developed and manufactured by well established companies, the PCB is a dedicated electronic component developed and manufactured only for a certain application. In fact, the

PCB is an application “tailor”-made electronic component. Under such circumstances, every company, large or SME, involved in development of innovative electronic products, mandatory needs to have proper human resources with high level of PCB design knowledge.

TIE event has succeeded to build up, during its long existence, around Romania, an academic environment strongly interested in education and training of the future engineers. In fact, it is possible to consider this geographical environment to be a real smart specialization one.

To achieve such a level of competence, it was, it is, and it will be necessary to have the electronics industry as an important actor and together with the academia to be involved in education and training of the future PCB design engineers. It is possible today to underline that TIE, supported by academia, has become also an industry-driven activity. The synergy between the electronics industry focused on development of electronic products and academia involved in education and training of the future electronic engineers has leaded to the continuous improvement of the quality of the graduate electronics engineers in our country.

The TIE 2015 final stage takes place in Oradea and is organized by the University of Oradea. I would like to thank to the Local Organizing Committee of TIE for the excellent support in organising TIE and for their outstanding commitment and effort in promoting high class conditions for this event.

I have also to thank to all TIE Committees for their total engagement to ensure a successful event.

Bucharest April 6, 2015

Prof. mult.D.h.c. Paul SVASTA, Ph.D.
TIE Initiator
Head of Center for Technological Electronics and Interconnection Techniques
“Politehnica” University of Bucharest, Romania

Dear participants and guests,

With the occasion of the 24th edition of the TIE contest, on behalf of the University Senate, let me wish all the guests a warm welcome in our University and also in Oradea.

Teaching activities in our university today is a means by which we build a certain type of society, a society of knowledge, which should bring a sustainable development and prosperity. One of the key factors for economic and social development is the quality of the workforce, which depends on the theoretical and practical readiness of our graduates.

Unfortunately, the rate of practical training of the students in universities in Romania is unsatisfactory. This is a resource which academics and industry employers must capitalize more intensely by developing attractive programs aimed at practical applications. For the Department of Electronics and Telecommunications from the University of Oradea, the chance to organize this year the 24th edition of TIE, is primarily an honor and a duty to contribute to the efforts needed to increase competitiveness, regional economic and social development and beyond.

The main beneficiaries of this competition will be the competitors, which, based on experiences from previous editions, we can ensure that will be monitored by major companies to carry out fixed-term internships and also for employment after graduation. Also, the companies from the socio-economic environment who will have the opportunity to know the most competent and serious students, and the sponsors the competition, whom we want to express our gratitude and give them the opportunity to present their offers and products, exposing rollups, banners or presentation stands.

Congratulations to the contest participants and I wish full success to all the activities listed in the event's program.

Let me conclude with the motto of the University Senate CONCORDIA RES CRESCUNT!

Prof. Sorin CURILĂ, Ph. D.
President of the Senate
University of Oradea, Romania

The TIE 2015 Workshop and Contest

It is again an honor and a great pleasure for me to express some of my thoughts about this TIE event, which takes place under the umbrella of the IEEE CPMT Society and is mainly sustained by the IEEE CPMT, Hu & Ro Joint Chapter.

Worldwide there are many contests regarding PCB-Design. But normally they are related to an EDA-Tool and the participants have plenty of time, normally month, to present their own ideas implemented with that tool. For instance, Mentor Graphics Corp. has his "Annual Technology Leadership Award" for many years, recognizing excellence in printed circuit board design. Competitors are free to choose from six categories their design topic, but need to use Mentor Graphics EDA-Tool. More than a month they have time to send their contributions. Another example is the contest "Your IoT Connected World", recently launched by Silicon Labs & Digi-Key. Here the designs must contain Silicon Labs MCU products. Contestants have also to be in selected countries in the Americas and Europe (Unfortunately, Romania is not mentioned!). NXP and Mouser Electronics launched their contest "2015 Big I.D.E.A.", the design contest featuring NXP`s Dual Configurable Logic and Mouser`s schematic tool software. The contest is open until June 2015.

But in my research I have nothing found similar to TIE! And this makes TIE so different and unique.

Here, the contesters are free to use the software tool of their choise to find the optimum and quickest solution in a fixed amount of time. The participant students at the TIE contest have only to show their high knowledge level regarding CAD- assisted design of interconnection structures of electronic modules.

TIE is an important pillar for innovation as it is industry- driven. This is supported by the Industrial Advisor Committee which gives the feed- back of the industrial needs. In this way the industry needs of the moment are directly implemented into the TIE contest.

The participants, coming from all University Centers of the country, show that TIE is a pool of competences formed by a high education level.

TIE paves the "way to turn the hobby into profession" for the young academia- formed and industry supported students. The fresh engineers can then be easily adapted to the specific needs of the companies involved in the development of electronic products.

TIE is a good example for how academia from this part of the European Union responds to the industry demands for educating human resources according to company needs. And this becomes even more important as many companies across the EU are now forced by strong competition to shift their production and even R. & D. activities towards this region of the EU.

The workshop organized at the final stage of TIE is a good opportunity for the participants to be informed by specialists of industry or research about the newest trends in electronic packaging.

TIE is prepared to answer to the challenges of the future, like Internet of Things (IoT), Industrie 4.0, Digital Factory, Big-Data, Wearable Electronics, 3D Printing, just to mention a few of them.

I wish good luck to all participants of this year final TIE event!

Oradea, April, 22nd, 2015

Detlef Bonfert, Ph. D.
TIE International Consultant Committee

Fraunhofer Research Institution for Microsystems and Solid State Technologies, EMFT
Circuits and Systems, CS-ATIS
Munich, Germany
detlef.bonfert@emft.fraunhofer.de

WELCOME TO ORADEA

Romania has been known for several decades for its cost effective labor force. Hence competitive labor cost was the main driver for foreign companies to relocate or expand their manufacturing activities in our country. Most notably the textile industry and later the manufacturing of automotive components with low value added have been the staple of foreign direct investment in Romania in the first 2 decades after 1990.

We are nevertheless aware that our competitive strengths lie not in assembling components but in engineering and innovation.

Successful investors are nowadays coming to Romania for the educated and talented human resources. It is innovation that is the key factor for their long-term success and innovation needs well-trained engineers, which universities have to provide to the industry.

TIE is a prime example of a successful partnership between industry and universities. It brings together the best students and universities and the most innovative companies in the electronic industry.

In the last few years we have been successful in attracting significant foreign direct investments in Oradea, mainly through a mix of pro-business public policies and the dedicated effort of a handful of specialists working for the Oradea Industrial Park.

All along this development we have become increasingly aware of how a healthy and transparent partnership between local government, the universities and companies can help economic growth and improve the quality of life in our community.

We are proud that Oradea is hosting this year's edition of TIE and with the support of Oradea University - Faculty of Electrical Engineering and Information Technology, Department of Electronics and Telecommunications, we aim to make Oradea a city where talented people want to study, work and live and where companies can develop successful and sustainable businesses.

Delia UNGUR
General Manager
Oradea Industrial park

TIE – An Opportunity for a Successfully Career

Since the first edition until now, TIE contest proved that the initial purpose was accomplished. Students that participate on this competition are assuring a start career in the field of PCB layout design, being also a reliable base for the development of a successful professional career. This contest, which from 2009 is international, bring together every year more and more participants from Romania and abroad.

The recent subjects presented at this competition have a complex and complete aspect. These are a true test for students, bringing high skill knowledge in the field of PCB layout design. With the presence of industrial members, the subjects become real and can be presented as a part from a real electronic device that is used in a real world. This aspect offer for all students' new ways of see the PCB layout design aspects, not only using the CAD software for creating the PCB, but to see the real and final product that was obtained from the competition subject. The participation for this competition can be an experience that is essential for an open minded student, who wants to expand his point of view, before going to work in the industry.

To conclude, as coach in the present and as contestant in the past, I can say that TIE is a true way of life, which unites students, teaching staffs and specialists in the PCB designing field connected to the electronic industry.

I wish to participants all the best at TIE 2015!

April 06th, 2015

Assist. Prof. Adrian-Ioan PETRARIU, Ph. D.
"Ştefan cel Mare" University of Suceava

Steps to be a TIE Winner

TIE event is a real contest for electronic enthusiastic students offering the chance to show the capabilities of a future engineer and having the opportunity to be examined by specialists in the PCB layout domain.
In my point of view, the participants for TIE should be with a really passion for the electronics field. I believe that this aspect is useful to have the necessary knowledge in accomplish the subject tasks.

To succeed in preparing this competition every participant need to be very dedicated in what he does. To become a winner of this competition is needed intense training on various projects with complex requirements and working hard in optimizing the time needed for finishing them.
I heard about this competition for the first time in the 2nd year of faculty from a professor that teaches at the University where I attended. Also the results obtained by other students at the local stages that were published on the faculty website and viewing other students working in PCB layout designing have cause a strong wish for trying this new side of electronics design.

The key to success for the 2014 edition was an intense training on different kind of projects and a good organization during the competition such as: careful reading of the subject, focus on the important points and especially keeping calm during the contest.
This competition is a way of interacting future graduates with industry specialists in the PCB design field. From them you can find out what they need from a future employee in a success career.

Suceava, April 6th, 2015

Dipl. Eng. Eduard GRIGORAŞ
TIE 2014 Winner
Continental Automotive Iaşi

Little Things Make a Big Difference

One of our most important focus areas during the past decade has been the development of future engineers to prepare them to face the high competitive and dynamic market of the electronics industry.

Today, medical equipment, semiconductors, software and electronic devices have developed across the globe, serving many needs in diverse business and consumer markets.

Consistently delivering new products that customers like and want, increasing revenue growth and profitability, and efficiently managing a global operation are just a few of today's top-of-mind issues for high-tech in electronics industry.

Collaboration with academic environment is our priority in reaching the level of knowledge, understanding and proactivity that today's economic market is requiring from current students, the future engineers. TIE contest is the tipping point, the "must have" competition for any student that aims high for his future career in electronics industry. TIE is one of the little things in the big world of electronics that makes a big difference for Romanian students that are willing to change today for a better tomorrow.

Celestica Romania supports the very well organized TIE contest and we are more than glad that this 24th edition will be in Oradea where in the past 10 years the electronics industry has developed and where passionate individuals can find their place in key engineering roles.

Dipl. Eng. Florin MUREŞAN
Site Engineering Manager
Celestica Oradea

Welcome TIE in Oradea

With over 20 years of experience, Connect Group is one of Europe's leading service providers of cable, PCB, and module assembly (Electronic Manufacturing Services). Founded in 1987, we have grown to a European network of production & design facilities, with around 1600 employees. The factory near Oradea is the largest one in the Connect Group. Connectronics Romania employs about 0.5% of city's total population. Part of this team, more than 80 technical engineers graduated at University of Oradea. With the extensive expertise our engineers have developed over the past twenty years, our company is fully qualified to offer you the specific technical support you are looking for. The sooner we are involved in the development of your project, the higher the added value of our engineering team will be. With our broad knowledge of technical and manufacturing possibilities, we can accompany the product development process from the concept stage onwards, to give optimal production, price and quality. Engineering activities function here as an extension of customers own design teams, with open communication, sharing of knowledge and pro-active search for solutions to support customers success. In whatever product group or market your company operates, engineers can provide development, industrialization and production support. Very fast prototyping, drawing and specifications writing allows us to move quickly into (volume) production and considerably narrow lead times from drawing board to market. Today, regulations, innovations and supply chain may influence the life cycle of your product. This may impact your operations. Our company supports you in designing easy-to-produce devices and ensures that they remain easy to produce.

This influences the relation between EMS and vendor and asks for increasingly integrated systems. Including added value considerations in product life cycle management requires specialized knowledge and skills. However, to be able to grow and continuously improve our service, we need also qualified people especially engineers that are able to design, create new concepts. In this respect for industry, TIE is

excellent opportunity to meet skilled future engineers who will be able to develop in the future new products that can bring added value to a company like Connect Group.

We would like to express our gratitude to Prof. mult.Dr. h.c. Svasta who placed Oradea on the map of TIE contest, thanks to this original idea of TIE, the companies have more opportunities to interfere with academically environment.

Special thanks to Prof. Cornelia Gordan, Ph.D. and Prof. Daniel Trip, Ph.D. from Electronics and Telecommunications Department from University of Oradea for close collaboration with Connect Group, for dedication showed in good communication with all industry representatives from Oradea. One the proof of this dedication is that the 24th edition of TIE is organized here, at Department of Electronics and Telecommunication from Oradea University.

We are proud that Connect Group is taking part in this event. Hopefully we can keep this collaboration during the coming years and both parties can have benefits and offer to students and future engineers' opportunities to develop their skills and carriers.

Dipl. Eng. Octavian MALAN
Operations manager
Connect Group Romania

Plexus supports TIE

Building relationships between companies and the next generation of engineers is an important step in the continuous advances in PCB design and technology.

Bridging the gap between study and the workplace is a lot easier if there is an insight into the expectations of companies. TIE opens new communication channels between Universities and the workplace and prepares students for the realities of working in a high paced technical environment.

We are happy to partner with the Department of Electronics and Telecommunications from University of Oradea at this event, especially as it is in Oradea for the first time, being an opportunity for Plexus to strengthen relationship with TIE, Students and the University. We as a company are very interested in offering students the frames to gain “real world” experience before graduation, offering continuously various student programs, including customized laboratory experiences. In the past years, several programs have been launched with the University, driving towards the employability of the students and a skilled workforce in an increasingly competitive European labor market.

Combining this excellent contest, now in Oradea, and the reputation of TIE, definitely supports the development of better human resources for the labor market and the access to a great source of expertise for the business.

We wish all TIE 2015 participants success and a fruitful experience!

Diana NĂSTASE
H.R. Manager, Plexus

Event Committees 2015

Steering Committee
Chairman:
Prof. Paul SVASTA, Ph.D., "Politehnica" University of Bucharest, Romania
Co-Chairmen:
Prof. Dan PITICĂ, Ph.D., Technical University of Cluj-Napoca, Romania
Prof. Sorin CURILĂ, Ph.D., University of Oradea, Romania

Members:
Prof. Dorel AIORDĂCHIOAIE, Ph.D., "Dunărea de Jos" University of Galaţi, Romania
Alexandru BORCEA, MBA, Romanian Association for Electronic and Software Industry, Romania
Prof. Vlad CEHAN, , Ph.D., "Gh. Asachi" Technical University, Iaşi, Romania
Prof. Cornelia GORDAN, Ph.D., University of Oradea, Romania
Prof. Daniel TRIP, Ph.D., University of Oradea, Romania
Assoc. Prof. Eugen COCA, Ph.D., "Ştefan cel Mare" University of Suceava, Romania
Prof. Aurel GONTEAN, Ph.D., "Politehnica" University of Timişoara, Romania
Prof. Tecla GORAŞ, Ph.D, "Gh. Asachi" Technical University of Iaşi, Romania
Prof. Ioan LIŢĂ, Ph.D., University of Piteşti, Romania
Prof. Ioan P. MIHU Ph.D., "Lucian Blaga" University of Sibiu, Romania
Assoc. Prof. Gheorghe PANĂ, Ph.D., "Transilvania" University of Braşov, Romania
Prof. Dan POPA, Ph.D. Maritime University of Constanţa, Romania
Prof. Dorina PURCARU, University of Craiova, Romania
Assoc. Prof. Adrian TULBURE, Ph.D., "1 Decembrie 1918" University of Alba Iulia, Romania
Gabriel VLĂDUŢ, Ph.D., Romanian Association for Technological Transfer and Innovation, Romania

Technical Committee
Chairman:
Prof. Norocel CODREANU, Ph.D., "Politehnica" University of Bucharest, Romania
Co-Chairman:
Lect. Adrian ŞCHIOP, Ph.D., University of Oradea, Romania

Members:
Assist. Prof. Constantin BARABAŞA, Ph.D., "Gh. Asachi" Technical University of Iaşi, Romania
Assist. Prof. Marius CARP, Ph.D., "Transilvania" University of Braşov, Romania
Assoc. Prof. Emilian CEUCĂ, Ph.D., "1 Decembrie 1918" University of Alba Iulia, Romania
Lect. Silviu EPURE, "Dunărea de Jos" University of Galați, Romania
Assoc. Prof. Mihaela HNATIUC, Ph.D., Maritime University of Constanța, Romania
Assist. Prof. Claudiu LUNG, University of Baia Mare, Romania
Lect. Alin MAZĂRE, Ph.D., University of Piteşti, Romania
Lect. Maximilian NICOLAE, Ph. D, "Politehnica" University of Bucharest, Romania
Assist. Prof. Adrian PETRARIU, Ph. D, "Ştefan cel Mare" University of Suceava, Romania
Lect. Marius RANGU, Ph. D., "Politehnica" University of Timişoara, Romania
Assist. Prof. Emanoil TOMA, "Lucian Blaga" University of Sibiu, Romania
Assist. Prof. Petre VANĂ, University of Craiova, Romania
Lect. Liviu VIMAN, Ph.D., Technical University of Cluj-Napoca, Romania

Programme Committee
Chairman:
Prof. Dan PITICĂ, Ph.D., Technical University of Cluj-Napoca, Romania
Co-Chairman:
Alexandru BORCEA, MBA, Romanian Association for Electronic and Software Industry, Romania

Members:
Prof. Alexandru GACSADI, Ph. D. University of Oradea, Romania
Dipl. Eng. Cosmin MOISĂ, Continental Automotive, Timişoara, Romania
Assoc. Prof. Ioan PLOTOG, Ph. D. "Politehnica" University of Bucharest, Romania
Assoc. Prof. Andrei DRUMEA, Ph. D. "Politehnica" University of Bucharest, Romania
Liliane MARGHESCU, Association for Promoting Electronic Technology, Romania
Assist. Prof. Rajmond JANO Ph. D., Technical University of Cluj-Napoca, Romania

Assist. Prof. Mihaela PANTAZICĂ, Ph.D. “Politehnica” University of Bucharest, Romania

International Consultant Committee

Prof. Dr.h.c. Karlheinz BOCK, Ph.D., TU Dresden, Electronics Packaging Lab IAVT, Dresden, Germany
Dr. Detlef BONFERT, Fraunhofer EMFT, Munich Germany
Prof. Dr.h.c. Zsolt Illyéfalvi-VITÉZ, Ph.D, University of Technology and Economics, Budapest, Hungary
Prof. Pavel MACH, Ph.D. Czech Technical University in Prague, Czech Republic
Prof. Jim MORRIS, Ph.D. Portland State University, Oregon USA
Prof. Alena PIETRIKOVA, Ph.D. Technological University of Kosice, Slovak Republic
Prof. Nihal SINNADURAI, Ph.D., IMAPS ELC Junior Past President
Dr. Habil. Heinz WOHLRABE, TU Dresden, Germany
Prof. Dr. h.c. Klaus-Jürgen WOLTER, TU Dresden, Germany

Industrial Advisor Committee

Chairman:
Cosmin MOISĂ, Continental Automotive, Timişoara, Romania

Co- Chairmen:
Gabriel CHINDRIŞ, Technical University of Cluj-Napoca, Romania
Cristian BERCEANU, YAZAKI Component Technology, Timişoara, Romania

Members:
Iulian BUŞU, ROMPOWER International SRL, Bucureşti, Romania
Adrian BOSTAN, MICROCHIP Technology, Romania
Andrei HAPENCIUC, MICROCHIP Technology, Romania
Paul HARFAS, Resonance Electronix, Timişoara, Romania
Andrei KECSEG-FONCE, Connect Group Oradea, Romania
Florin MUREŞAN, Celestica Oradea, Romania
Gabriel NEAGU, Electronica Azi, Bucharest, Romania
Cătălin NEGREA, Continental Automotive, Timişoara, Romania
Andrei NICORAŞ, Plexus Oradea, Romania
Flaviu NISTOR, Continental Automotive System SRL, Sibiu, Romania
Georgel PĂUNESCU, SIMEA Sibiu srl, Romania
Mihai PETRIC, Continental Automotive, Romania
Bogdan PICĂ, Continental Automotive System SRL, Sibiu, Romania
Mariana POPÂRLAN, SIMEA Sibiu srl, Romania
Cristian RUS, Continental Automotive Romania

Teodor Mihai SĂCĂCIAN, Shinheung Electronics Oradea, Romania
Sorin SINTEA, SIT srl, Constanța, Romania
Emilian STOICA, SIMEA Sibiu srl, Romania
Ovidiu TIMOFICIUC, Miele Tehnica srl, Romania
Corneliu TOMA, Digitech srl, Romania
Alexandru TRIFAN, Continental Automotive, Romania

AFCEA support Committee
Chairman:
Col. Eng. Liviu COŞEREANU, Ph.D, President AFCEA Bucharest Chapter, Romania

Members:
Prof. Dorel AIORDĂCHIOAIE, Ph. D., "Dunărea de Jos" University of Galați, Romania
Prof. Aurel GONTEAN, Ph. D., "Politehnica" University of Timişoara, Romania
Assoc. Prof. Mihaela HNATIUC, Ph. D., Maritime University of Constanța, Romania
Prof. Dan PITICĂ, Ph. D., Technical University of Cluj-Napoca, Romania
Lt. Col. Eng Tiberius TOMOIOAGĂ, Tresurer AFCEA Bucharest Chapter, Romania

Promotion & Advertising Committee
Chairman:
Lect. Marian VLĂDESCU, „Politehnica" University of Bucureşti, Romania
Co-Chairman:
Lect. Alin MAZĂRE, University of Piteşti, Romania

Members:
George CRĂCIUNAŞ, Technical University "Gh. Asachi" of Iaşi, Romania
Bianca DEORDICA, „Transilvania" University of Braşov, Romania
Prof. Nicolae DRĂGHICIU, Ph.D. University of Oradea, Romania
Assist. Prof. Anisia FLORESCU, „Dunărea de Jos" University of Galați, Romania
Assist. Prof. Rajmond JANO, Technical University of Cluj-Napoca, Romania
Assist. Prof. Cristina MARGHESCU, „Politehnica" University of Bucharest, Romania
Assist. Prof. Adrian PETRARIU, „Ştefan cel Mare" University of Suceava, Romania

Student Committee
Chairperson:
Assist Prof. Mihaela PANTAZICĂ, AFCEA Politehnica University Student Chapter Chair, Romania
Assist Prof. Cristina MARGHESCU, IEEE-CPMT "Politehnica" University of Bucharest SBC Chair, Romania

Members:
Florin AVRAM, University of Oradea, Romania
Marius VENTEL, University of Oradea, Romania

Local Organizing Committee
Chairperson:
Prof. Cornelia GORDAN, Ph. D., University of Oradea, Romania

Co-Chairman:
Prof. Daniel TRIP, Ph. D. University of Oradea, Romania, Vice Dean of Electrical Engineering and Information Technology Faculty, Romania

Members:
Assoc. Prof. Simona CASTRASE Ph. D. University of Oradea, Romania
Assoc. Prof. Liviu MOLDOVAN Ph. D. University of Oradea, Romania
Assoc. Prof. Ovidiu NEAMȚU Ph. D. University of Oradea, Romania
Lect. Sorin POPA, Ph. D., University of Oradea, Romania
Lect. Romulus REIZ, Ph. D. University of Oradea, Romania
Lect. Marin TOMȘE, Ph. D. University of Oradea, Romania
Asist. Prof.Răzvan ALBU, Ph.D. University of Oradea, Romania
Asist. Prof. Adrian BURCĂ, University of Oradea, Romania

Technical secretariat
Chairperson:
Delia LEPĂDATU, Center for Technological Electronics and Interconnection Techniques, UPB-CETTI

Members:
Bogdan ANTON, Association for Promoting Electronic Technology, Romania
Bogdan MIHĂILESCU, Association for Promoting Electronic Technology, Romania
Maria PĂTULEANU, Center for Technological Electronics and Interconnection Techniques, UPB-CETTI
Florentina STĂLINESCU, Association for Promoting Electronic Technology, Romania

TIE 2015 Program

<table>
<tr><th colspan="4">Thursday, April 23, 2015</th></tr>
<tr><td></td><td>“Students” Track</td><td>“Steering Committee” Track</td><td>“Technical Committee” Track</td></tr>
<tr><td>08:00-10:00</td><td colspan="2">Welcome
Room A002 pav. A,
(Administration Council Room)
University Str., No.1, Oradea</td><td rowspan="3">Technical meeting
(local members only)
Room B215, pav.B,
second floor
University Str., No.1,
Oradea</td></tr>
<tr><td>9:15</td><td colspan="2">Gathering for Eurobusiness Park visit.
Location: Room A002 pav. A,
(Administration Council Room)</td></tr>
<tr><td>10:00-12:45</td><td colspan="2">Visit to Eurobusiness Park Oradea Romania</td></tr>
<tr><td>12:45- 13:30</td><td colspan="3">Lunch
Student Canteen
University Str., No.1, Oradea</td></tr>
<tr><td>13:00- 14:00</td><td colspan="3">Registration of the participants
Room A002 pav. A, (Administration Council Room), Aula Magna
University Str, No.1, Oradea</td></tr>
<tr><td rowspan="2">14:00-19:00</td><td colspan="3">Opening Ceremony
Aula Magna, University Str., No.1, Oradea</td></tr>
<tr><td colspan="2">International Workshop
„Introduction to the New Era of Industrial Revolution – Industrie 4.0”
Aula Magna</td><td>Technical meeting
Room B215, pav. B,
second floor</td></tr>
<tr><td>19:00-20:00</td><td colspan="3">Student Technical Session
Presentation of TIE 2014 subjects
Set-up and checking of contest computers, CAD environments
University of Oradea Library, Conference Room, ground floor
University Str., No.1, Oradea</td></tr>
<tr><td>20:00-21:00</td><td colspan="3">Dinner
Student Canteen</td></tr>
<tr><td>21:00-22:30</td><td colspan="2"></td><td>Round Table Discussion
TIE Plus
Steering Committee, Industrial Advisor Committee and Technical Committee meeting
Room B215/B222, pav. B, second floor</td></tr>
</table>

Friday, April 24, 2015			
07:00-07:30	Breakfast University of Oradea Library, Main Hall, ground floor		**Technical preparation** University of Oradea Library, Conference Room, ground floor
07:30-08:00	**TIE 2015 contest preliminary activities** University of Oradea Library, Conference Room, ground floor		
08:00-12:00	**TIE 2015 CONTEST** University of Oradea Library, Conference Room, ground floor	**09:00-11:00** **Panel Discussion Electronic Industry HR Department & AFCEA Student Club** Room A002 pav. A, (Administration Council Room)	**Technical session** University of Oradea Library, Meeting Room third floor
12:00-13:00	Lunch University of Oradea Library, Main Hall, ground floor		
13:00-18:00	**Assessment of the TIE 2015 projects** University of Oradea Library, Conference Room, ground floor		
18:00-18.30		**Steering committee meeting** Room B215, pav. B, second floor	
18.30-19.40	**TIE 2015 - Awarding ceremony** Aula Magna		
20:00-22:00	Gala dinner TIE 2015 Hotel Continental		

Saturday, April 25, 2015	
07:30-08:30	Breakfast
09:00-12:00	Ending session / Final remarks Room B215, pav.B, second floor

Note: Items in the program marked with **bold** type represent **compulsory activities** for the given track.

UNIUNEA EUROPEANĂ

GUVERNUL ROMÂNIEI

Instrumente Structurale 2007 - 2013

Workshop

„Introduction to the New Era of Industrial Revolution – Industrie 4.0”

23 April 2015

13:00-16:30 ***Registration***

14:00-14:30

Welcome TIE Steering Committee:
Prof. Sorin CURILĂ, Ph.D., President of the University of Oradea Senate,
Welcome universities:
Prof. Constantin BUNGĂU, Ph.D., Rector of the University of Oradea,
Welcome industries:
Delia Ungur, General Manager Eurobusiness Park Oradea
Welcome TIE technical workshop:
Prof. Dr. h. c. mult. Paul Svasta, Ph.D. President APTE

14:30-16:30 ***First Session: Changes in the Electronic Industry Environment. The role of Innovative Clusters***
Session chairs:
Prof. Dan Pitică, Ph.D., Technical University of Cluj Napoca, Romania
Prof. Dr.h.c. Zsolt Illyefalvi-Vitez, Ph.D., Electronic Technology Department, Budapest University of Technology and Economics, Hungary

14:30-15:00 Industrie 4.0 and its Impact on Automation Technology

Mihai Drăgan, Fraunhofer IPA, Stuttgart, Germany

15:00-15:30 Tools to foster cross-sectorial cluster cooperation: competence mapping

Daniel Coşniță, President, Romanian Cluster Association - CLUSTERO

15:30-16:00	The new support frame paradigm of the innovative start-ups and spin-offs **Alexandru BORCEA**, MBA, Vice President APTE, Association for Promoting Electronic Technology
16:00-16:30	The role of HR in innovative environments **Aurelia Florea,** Director Human Resources, SC Miele Tehnica SRL
16:30-17:00	***Networking Break***
17:00-19:00	***Second Session: New Challenges in Electronic Design*** *Session chairs:* *Prof. Robert Boesnecker, Ph.D., Technische Hochschule Deggendorf, Germany* *Prof. Cornelia Gordan, Ph.D., University of Oradea, Romania*
17:00-17:25	Factory of the Future **Petru Demian**, Ph.D., Head of Industrial Engineering, Continental Automotive Romania SRL, Timisoara
17:25-17:50	EuroTraining's Thematic Trainings for SMEs **Hervé Fanet**, Director CEA-Léti Minatec Campus, Grenoble, France
17:50-18:15	Signal Integrity Analysis **Thomas Goetz,** Sales Manager Central and Eastern Europe EMG, Keysight Technologies
18:15-19:00	TIE Plus. The step towards interconnect simulation technology **Cătălin Negrea**, Ph.D., Team Leader - EE Simulation TSR, Instrumentation & Driver HMI, Research & Development Electronic Engineering, Continental Automotive Romania

Panel Discussion
Electronic Industry HR Department
&
AFCEA - Armed Forces Communications and Electronics Association - Student Club

24 April 2015, 09:00-11:00

Room A002 pav.A, (Administration Council Room)

09:00-11:00

Moderators:

Dan PITICĂ, AFCEA UTCLUJ Student Club Advisor

Paul SVASTA, AFCEA "Politehnica" University of Bucharest Student Club Advisor

Panelists:

Maria MARCOVICI, HR Marketing Specialist, Continental Automotive România, Timişoara

CODRUȚA SORINA BALA - Celestica Human Resources Director

Alexandra OLTEAN, Celestica România, Oradea

Diana NĂSTASE, Manager – H.R., Plexus Manufacturing Solutions, Oradea

Cosmin MOISĂ, Continental Automotive, Timişoara, Romania

Aurelia FLOREA, Human Resources & Administration Manager - Brasov Plant, Miele Tehnica SRL

Aurel GONTEAN, AFCEA "Politehnica" University of Timişoara Student Club Advisor

Cosmina GEORGESCU, ICM Dacia Piteşti Highschool

Mihaela HNATIUC, AFCEA Maritime University Student Club, Constanța

Bogdan MIHĂILESCU, Association for Promoting Electronic Technology, Bucharest

TIE 2015

DESIGN OF ELECTRONIC MODULES AND ASSEMBLIES
Student Professional Contest

Awarding Ceremony

24 April 2015 – Aula Magna

18:00-18:30 ***Registration***

18:30-18:45 ***Opening Ceremony Speeches:***
Prof. Cornelia Gordan, Ph.D., University of Oradea, Romania
Dipl. Eng. Alexandru Borcea, MBA, President of Romanian Association for Electronic and Software Industries

18:45-18:50 ***State of the art TIE 2015***
Prof. Norocel Codreanu,Ph.D, Politehnica University of Bucharest,
TIE Technical Committee Chair

18:50-19:15 ***TIE 2015 Awarding***
Prof. Dr.h.c.mult.Paul Svasta, Ph.D., Politehnica University of Bucharest,
TIE Steering Committee Chair
Prof. Dan Pitică, Ph.D., Technical University of Cluj Napoca,
TIE Steering Committee Co-Chair

19:15-19:30 ***PCB Designer Certification recommended by TIE IAC***
Dipl. Eng. Cosmin Moisa, Continental Automotive Timişoara,
TIE Industrial Advisor Committee Chair
Assoc. Prof. Gabriel Chindriş, Ph.D., Technical University of Cluj Napoca,
TIE Industrial Advisor Committee Co-Chair

19:30-19:40 ***Looking Forward TIE 2016***
Assoc. Prof. Eugen Coca, Ph.D.,"Ştefan cel Mare" University of Suceava, ***TIE 2016 Chair***

TIE 2015 Gala Dinner (see on page 23)

- TIE 2015 Workshop Summaries -

Industrie 4.0 and its Impact on Automation Technology

Abstract: Industrie 4.0 is Germany's response to the paradigm change given by the upcoming age of digitalisation. It is time to meet the new challenges through sustainable new solutions, especially in the ever developing field of production automation.

Keywords: Industrie 4.0, automation, digital, industrial revolution.

Upon a short introduction about the Fraunhofer-Gesellschaft, this keynote talk tries to tackle two main topics: industrial revolutions in the context of modern technology, and also their influences on production technologies.
Although the scholars are not on the same page yet when it comes to count and label the industrial revolution we have experienced so far, it is clear that we are on the brink of revolutionary changes in technologies like IT, automation or factory management. The Strategic Initiative Industrie 4.0 launched by the German Federal Government tries to focus research and development efforts on handling the new paradigm and offering competitive solution, well beyond the state of the art, and its influence on automation will be noticeable.


Fig. 1: Human-robot

Like personal computers some 30 years ago, (industrial) robots are about to enter a new age of unprecedented versatility and affordability, making them the key tool for lean and human-safe collaborative production processes. Once a powerful, safe and reliable cloud software platform is accomplished, a whole new playground is open for business, making flexible, automated production easy to have and to master.

Stuttgart, 23.03.2015

Mihai Drăgan
Fraunhofer IPA
Stuttgart, Germany
mud@ipa.fhg.de

Tools to foster cross-sectorial cluster cooperation: competence mapping

Abstract: Small and medium size enterprises (SMEs) face the challenge of keeping up with global innovation tendencies dominated by a new non-linear and systemic approach based on cross-sectorial cluster initiatives and networks. Identifying key competences at enterprise level represents a condition sine qua non for the business development based on innovation and internationalization.

Keyword: provide, max. 5, keyword, here: innovation, non-linear, cross-sectorial, competence mapping

Innovation can be described as the result of interactions between the various players in the so called innovative systems. The systemic vision on innovation has been called into question by (Lundvall, 1992), (Nelson, 1993) and more recently (Guth, 2012). Given these new approaches, the traditional linear model of innovation that started from basic research and then moved to applied research, prototypes and eventually reached marketable products is becoming less and less relevant. An application of systemic theory of innovation, combined with the concepts of individual and institutional learning lies in the paradigm of clusters, as innovative non-linear tools to foster regional economic development. Another important aspect of innovation is the horizontal aspect becoming more and more relevant in recent years in the frame of European re-industrialisation processes, i.e. vertical industrial sectors like textiles, automotive, etc. turn into cross-sectorial emerging industries such as creative industries, green technologies, mechatronics etc. According to recent studies (2014) performed on behalf of the National Authority for Scientific Research and supported by the Jasper Programme, several cross-sectorial cluster networks have been identified in Romanian, such as mechatronics, technical textiles and electronics for smart systems in Bucharest-Ilfov, technical textiles in the North East and

biotechnology in the West Region. At national level, creative industries and green technologies, both including electronics, seem to be the most important tendencies of cross-cluster cooperation.

The discussion is of utmost important at the enterprise level, too, as SMEs need to keep up with global innovation tendencies. Recommended tools to discover and enhance the innovation potential and trigger business development horizontally towards completely new sectors are the "competence mapping" processes. One most successful ones has been developed and extensively used in Lower Austria leading to the establishment of the mechatronics and plastics clusters and it has been transferred already to Upper Austria, South Tyrol, Sweden and Romania (pilot phase).

Competence Mapping © describes a systematic approach to identify strategically significant innovation potential and to develop cross-sectorial economic fields of strength.

In intensive workshops, companies learn to change their views from product related development to a clear definition of their competences and identification of clear new applications and markets.

The method encompasses following topics: Analysis of the business model of the organisation; Analysis of the development vectors in the organisation; Competence Fiche of the organisation, Mapping of innovation potential; Mapping of internationalisation potential. The result is presented under the form of an innovation and internationalization strategy.

From a methodological point of view it encompasses following phases:

Prepare: Members of the enterprises wishing to take part in the competence mapping © will be approached by the moderator team. The client will be provided a short methodological briefing.

Analyse: During a half to full day workshop the moderation team visits the client's organization which enables them to get a deep insight into their business. This workshop is intended to get information about: the client's motivation to do the competence mapping exercise in more detail; the client's business model, to have a detailed discussion on competences, resources and skills; future factors, i.e. the client team thinks on factors having a future impact on their business and resolving obvious business opportunities.

Search: After the analysis workshop, the moderator team refines in a first step data which have been collected during the workshop according to defined syntax and reformulates more precisely competencies, skills and resources. The second task during this phase comprises detailed innovation potential research to identify business opportunities outside the current scope of activities.

Check: In a second workshop, the client double checks the competence sheets that have been created, edited and adapted in the former steps.

Start: After the second workshop the client checks a final version of the competence mapping© documents and decides internally further steps.

Bucharest, 02.04.2015

Daniel Coşniță, President
Romanian Cluster Association - CLUSTERO
Bd. Ion Ionescu de la Brad 6, Bucharest
daniel.cosnita@clustero.eu

The new support frame paradigm of the innovative start-ups and spin-offs

Abstract: The importance of innovative start-ups and spin-offs was highlighted even by the first economists like Adam Smith and Friedrich List, but understanding the evolution of their paradigm and development frame is crucial to define appropriate measures and services in their support. If Adam Smith spoke about the importance of innovation, and Friedrich List framed the first support measures and strategies, at the beginning of the 21 century, the innovation related to new comers like start-ups and spin-offs became one of the most important duties of governments and local authorities to support local, regional, national and state unions' competitiveness.

Keyword: start-up, spin-off, innovation, support

If Adam Smith spoke about innovation and its importance in the frame of the first industrial revolution, and Friedrich List in the frame of the second one, according to the Kondratieff industry cycles, in this very moment the entire globe is challenged by the fourth industrial revolution in a global world. If in the case of the first industrial revolution the focus was on the capital and individual initiatives, and in the case of the second industrial revolution was on the concentration of resources in big industrial organizations and government support to conquer new market places, at the beginning of the 21 century, in the frame of the fourth industrial revolution, the focus is on sophisticated value chains, at local, regional, national and international levels, for which the entire community and its related communities are responsible.

And it is not only about the fourth industrial revolution but about the new human condition so nicely described by Prof. Peter Drucker in 1999: *In a few hundred years, when the history of our time will be written from a long-term perspective, I think it is very probable that the most important event these historians will see is not technology. It*

is not the Internet. It is not e-commerce. It is an unprecedented change in the human condition. For the first time, and I mean that literally, very substantial and rapidly growing numbers of people have choices. For the first time, they will have to manage themselves. And let me say, we are totally unprepared for it.

In the frame of this new paradigm, nobody and any community can hide or to excuse its responsibility regarding the competitiveness, welfare, wellbeing and sustainable development of the entire community and related communities in front of the actual or future generations. Especially the support for the new generations, founders and generators of new ideas through start-ups and spin-offs, should be not neglected, from their first steps to understand the world, during their active live and beyond. Starting with the education, the foundation of the new generations, followed by innovation and creativity support and globalization, the entire value chain have to encourage the imagination and aspirations of people. People have to support each other in front of their challenges and communities have to support their members and to support other communities too. In an interconnected and globalized world any person or community should not be excluded.

We are responsible for our life and our world, but we are responsible too to support the new generations and new ideas as foundation of the world which has to come.

Bucharest, 02.04.2015

Alexandru Borcea
Vice President APTE, Association for Promoting Electronic Technology
ELINCLUS - Electronic Innovation Cluster member
President of ARIES
Romanian Association for Electronic and Software Industry
202A Splaiul Independentei, Bucharest
0040722664148
borcea@aries.ro

The role of HR in innovative environments

"The world is becoming a faster changing and more turbulent place for organizations and the necessity to adapt has never been greater"
Jacob Morgan – Author at "The Future of Work"

The fact that we are living in a constantly changing world is a reality we all have to face. We cannot afford to live in the present unless we pay attention to the trends of the future workplace markets.

According to recent studies, we are facing six megatrends that will change the future of work by 2030: globalization 2.0, environmental crisis, individualism and value pluralism, digitalization, demographic change and technological convergence.

For anyone in the field of HR, it is no secret that all processes must be ahead of the technical and social trends of the world. Therefore, there is a need for a vision, strategy to represent how the world will look like in 2030. And most important of all, we have to act, to research and change our attitude accordingly.

How can we do that? First of all, living in a strong partnership with the academic environment, we believe in the Universities' capacity to become more and more responsive to employers' needs and offer a variety of avenues for qualification programs. Also, we contribute to support and encourage the technological advancements to train the future employees with skills adapted to the new and rapidly changing market requirements.

We, Miele, as a company, provide students the access to real life of technology in electronic industry environment. Programs such as Mastership, Internship or Practice facilitate a better assimilation of

theoretical knowledge and ensure that candidates are able to face the challenges as future employees.

Another strategic approach in preparing for future is to implement and develop the clear and simple processes using the latest trends in technology as platform to attract, keep and develop top level employees.

For me personally it is always a challenge to be able to integrate the right tools to provide the business the necessary resources for performance, guiding people towards a common understanding of their role in the growth of our organization.

Braşov, 6th of April, 2015

Aurelia Florea

Director Human Resources
SC Miele Tehnica SRL

Factory of the Future

Abstract: The aim of this paper is to provide a fast view of the automotive electronic production challenges and the future solutions in the automotive modern factory.

Automotive market view

Nowadays, the automotive electronic factories have to adapt to the following main challenges:

- Product Life Cycle reduction (PLC) (from 3 years to 1.5year);
- Cost pressure & increase worldwide competiveness;
- Consumer electronic products enter the automotive market;
- Infotainment & communication are already important parts of the car;
- The modern car is more an electronic & software product than a mechanical one.

Future development

Faster Product Life Cycle imposes factories to rapidly introduce new products and variants with reasonable start-up cost and short implementation time in the production.

A possible solution for the mentioned PLC reduction cycle is to focus on clever automatization, multiproduct line concepts with easy and efficient change management and version management processes.

Cost pressure in automotive comes not only from direct and indirect customers pressure, but is amplified by the fact that more and more typical non-automotive products are integrated in the car and also non-automotive electronic & related software products enter the automotive market (for example infotainment suppliers).

So, the automotive factories are forced to produce with automotive standards/ high quality and reliability at the cost of consumer electronic market. This means that continuous optimization of internal processes, 5S, LEAN manufacturing and 6 Sigma are mandatory parts of the daily life in the future factories.

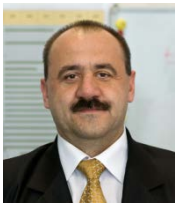
Future cars become electronic and related software products; usually more than 60 electronic units are connected and communicate between them. Even more, the new development goes in the direction of car to car communication, internet communication and semiautomatic/ automatic software update, video stream processing, and gradually semiautomatic/ automatic driving will become usually.
Under this condition the future factory production equipment has to deal with high complexity electronic units, production test equipment has to simulate the real car environment and to manage a lot of product software variants and changes.
The testing of electronic units is changing from classical ICT/ test point access to boundary test and complex hardware/ software self test using design for test approach from the start of the product development.

Fast production line reconfiguration, automatic product variant management, production line adaptation and complete product traceability database combined with high degree of automatic solutions are mandatory elements for the future factories.

Considering all the above mentioned, the **future automotive factory** has to be an **intelligent system** with a very strong IT/ software structure that supports not only the technical needs relegated production processes, but also integrate decision making software solutions for all the factory values stream.

Timisoara, April 2015

Petru Demian, Ph. D.
Head of Industrial Engineering
Continental Automotive Romania SRL, Timisoara
Phone: +40722 436 517

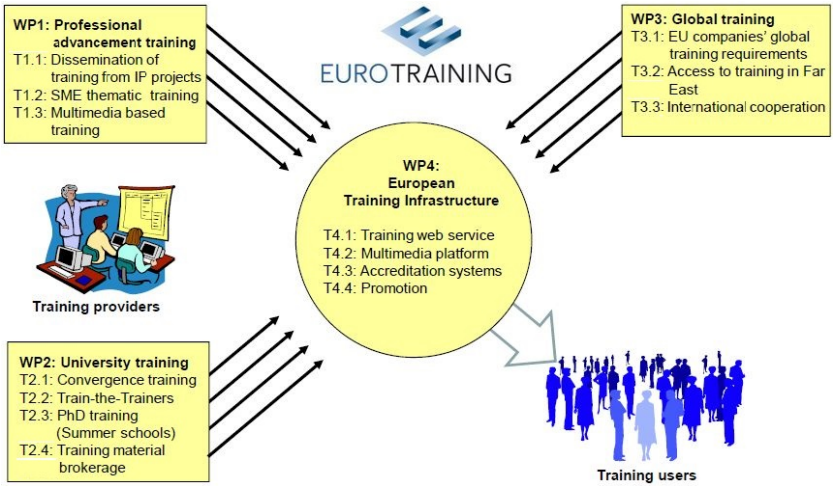


EuroTraining's Thematic Trainings for SMEs

Abstract: EuroTraining is a European Commission sponsored FP7 Coordination and Support Action with the aim of providing a European Training Infrastructure (ETI) facilitating the provision of high calibre training across Europe. The service is available at www.eurotraining.net. A work package (WP1) is dedicated to the identification and cataloguing advanced trainings originating from EC sponsored project; as well as, the provision of thematic and multimedia trainings for SMEs. EuroTraining also supports higher education by a course materials exchange service; cataloguing the available summer schools; organizing train-the-trainers courses; and collecting international graduate programmes available in the EU. The training actions enhance the development of the European knowledge-based society in the fields of embedded systems, micro-/nanoelectronics and smart integrated systems.

Keyword: thematic training, multimedia training, small and medium size enterprises (SMEs), train-the-trainers courses, summer schools.

The figure below shows how the different workpackages and tasks of EuroTraining promote training users, including small enterprises.



The objectives of WP1: Professional Advancement Training are:

- to identify and make available advanced trainings originating from EU funded projects, and from the ENIAC and ARTEMIS platforms;
- the provision of thematic trainings, focusing on the convergence of advanced More-than-Moore elements with beyond-CMOS devices, and their integration and interfacing with existing technology; and
- to develop and offer multimedia based trainings dedicated to SMEs.

For more information about the project services and results, please visit the website at www.eurotraining.net, or contact the coordinator and/or the relevant project partner, listed in the table below.

The EuroTraining Project is funded by the European Union.

Start : 01.01.2013
End : 31.12.2015

Project Partners

FSRM - Switzerland (Project Coordinator)
Annette Locher - fsrm@fsrm.ch

Technical University of Denmark (Higher education, Newsletters)
Erik Bruun, Caroline van Oosterhout - eurotraining@elektro.dtu.dk

COREP - Politecnico di Torino - Italy (Web service, Multimedia)
Danilo Demarchi, Fabio Demarchi, Helma Elens - eurotraining@polito.it

BME-ETT - Hungary (Train-the-Trainers, Global networking)
Zsolt Illyefalvi-Vitéz, Olivér Krammer - krammer@ett.bme.hu

CEA-LETI - France
Hervé Fanet, Susana Bonnetier, Céline Soubeyrat - sousana.bonnetier@cea.fr

Grenoble, 22nd March 2015

Hervé Fanet
Director
CEA-Léti
Minatec Campus, Grenoble, France
herve.fanet@cea.fr

Signal Integrity Analysis

The proliferation of high speed serial links has driven the wide spread use of differential pairs. A differential pair is nothing more than two, single ended transmission lines, with some coupling, used together to carry a differential signal from a transmitter to a receiver.

Every single backplane produced today, and in the foreseeable future, is composed of multiple channels of differential pairs.

The capability of the system to keep the integrity of signal could be evaluated in time domain or frequency domain.

Time Domain Reflectometry is used for more than 40 characterization, modeling, and emulation applications using single or multiple ports TDR. In frequency domain 4-port Vector Network Analyzer (VNA) is used for Physical Layer Test System (PLTS).

De-embedding is commonly used to remove the contribution of probing to circuit board traces, backplane channels, semiconductor packages, connectors and discrete components.

In signal integrity applications, de-embedding is the most important technique besides calibration for obtaining artifact-free device measurements. It is noteworthy to mention that full de-embedding requires all s-parameters for the fixture.

With a differential fixture, this means the s4p Touchstone file will have all 16 elements in the 4x4 matrix.

Once you have the S-parameter file for the fixture, the built in de-embedding features of the VNA, PLTS or Software applications can

be used to separate the true performance of the device under test from the artifacts introduced by its fixture.

Few examples and comments complete the presentation.

The principles of TDR and VNA operation are detailed in references listed in the bibliography.

Thomas Goetz
Sales Manager Central and Eastern Europe EMG
+49 69 677 343 2223 Phone
thomas_goetz@keysight.com
Keysight Technologies
Sales&Services GmbH &Co. KG
Frankfurt/Main, Germany

TIE Plus
The step towards interconnect simulation technology

Abstract: "TIE Plus" represents a new challenge under the TIE brand, focused on supporting simulation technologies for PCB design. The main disciplinary areas of interest are signal and power integrity.

Keyword: electro-magnetic simulation, signal integrity, interconnect modeling

The continuous complexity increase of electronic assemblies correlated with today's time-to-market demands creates the need of accelerated development cycles that imply the usage of virtual prototyping techniques. From the pool of virtual prototyping disciplines, one of the leading roles in PCB design is attributed to signal and power integrity. The need to incorporate such specialized electromagnetic simulations in to the PCB design flow is determined by the fact that, at high frequencies associated with digital data transmissions, the interconnect can be no longer considered an ideal electrical connection and the parasitic elements have to be taken in to consideration. Assuring the compliance of signal waveforms to data transmission standards in a non-ideal electromagnetic environment is becoming more of a challenge as data transfer rates and component density continually increase. Modeling the parasitic elements of an electronic system interconnect and evaluating the signal parameters, as a result of the interactions with integrated circuits, represents the basic principle of signal integrity analysis.

The workshop will cover a brief introduction in the field of signal integrity and the associated topics of interest for future candidates, followed by an exemplification of a subject and its corresponding solution.

As a result of the increasing industry demand for such specialized roles of electrical engineering, TIE takes one step further in promoting high level expertise in the field of electronic packaging.

The successful implementation of a contest stage for such a high-level technical field represents a major challenge for both academia and industry, which have to align to the newest trends in computer-aided design.

TIE Plus aims to create a collaborative-competitive environment where the candidates presents their technical solutions for the proposed subject, but also exchange ideas on simulation approaches and get in touch other PCB design professionals.

Timisoara, 02.04.2015

Cătălin Negrea, Ph. D.
Team Leader - EE Simulation TSR
Instrumentation & Driver HMI
Research & Development Electronic Engineering

Continental Automotive Romania
Str. Siemens, No.1
catalin.negrea@continental-corporation.com

TIE Industrial Advisor Committee
Recommended PCB designers from 2010-2014

Participant Name	University	Year
Dungă Tudor Dan	"Politehnica" University of Timişoara	2010
Pică Zamfir	Technical University of Cluj-Napoca	2010
Gross Péter	BME Budapest	2010
Antonovici Dorin	"Ştefan cel Mare" University of Suceava	2010
Condrea Daniel	"Ştefan cel Mare" University of Suceava	2010
Lupuț Cătălin	"Politehnica" University of Timişoara	2010
Banciu Alexandru	"Politehnica" University of Bucharest	2010
Fülöp Krisztián	BME Budapest	2010
Tudose Mihai Liviu	"Politehnica" University of Bucharest	2010
Burghiau Mihai	"Ştefan cel Mare" University of Suceava	2010
Knizel Alexandru	"Politehnica" University of Timişoara	2010
Pandelică Ovidiu	University of Piteşti	2010
Caracațeanu Cătălin	"Dunărea de Jos" University of Galați	2010
Țibuleac Cătălin	"Politehnica" University of Bucharest	2010
Blănaru Andrei	"Transilvania" University of Braşov	2010
Malinetescu Adrian	North University of Baia Mare	2010
Ungureanu Vlad	“Transilvania” University of Braşov	2010
Precup Călin	"Politehnica" University of Timişoara	2011
Antonovici Dorin	"Ştefan cel Mare" University of Suceava	2011
Mareş Mihai	University of Piteşti	2011
Gordan Cristian	"Politehnica" University of Timişoara	2011
Burghea Mihai	"Ştefan cel Mare" University of Suceava	2011
Crăciun Gabriel	"Politehnica" University of Timişoara	2011
Țibuleac Cătălin	"Politehnica" University of Bucharest	2011
Bostan Adrian	"Politehnica" University of Bucharest	2011
Fiastru Bogdan	Technical University of Cluj-Napoca	2011
Aldea Alin	University of Piteşti	2011
Andrieş Lucian	"Ştefan cel Mare" University of Suceava	2011
Caracațeanu Cătălin	"Dunărea de Jos" University of Galați	2011
Aldea Alin	University of Piteşti	2012

Turdean Mihai	Technical University of Cluj-Napoca	2012
Andrieş Lucian	"Ştefan cel Mare" University of Suceava	2012
Avădanii Alexandru	"Politehnica" University of Bucharest	2012
Mares Mihai	University of Piteşti	2012
Marin Marian Valentin	University of Piteşti	2012
Burgheaua Mihai	"Ştefan cel Mare" University of Suceava	2012
Tănase Mihai	"Politehnica" University of Bucharest	2012
Boţilă Alexandru	"Politehnica" University of Timişoara	2012
Ţibuleac Cătălin	"Politehnica" University of Bucharest	2012
Gordan Cristian	"Politehnica" University of Timişoara	2012
Antonovici Dorin	"Ştefan cel Mare" University of Suceava	2012
Ardelean Mihaela	"Politehnica" University of Timişoara	2012
Ştefan Andrei	"Politehnica" University of Bucharest	2012
Bostan Adrian	"Politehnica" University of Bucharest	2013
Bota Claudiu	"Politehnica" University of Timişoara	2013
Ilie Mihai	Technical University of Cluj-Napoca	2013
Timoficiuc Ovidiu	"Ştefan cel Mare" University of Suceava	2013
Olenici Alexandru	Technical University of Cluj-Napoca	2013
Sofîlca Ionuţ-Bogdan	“1 Decembrie 1918” University of Alba Iulia	2013
Grigoraş Eduard	"Ştefan cel Mare" University of Suceava	2013
Chitic Mihail	“Transilvania” University of Braşov	2013
Petric Cristian	"Politehnica" University of Timişoara	2013
Cervis Alexandru	Maritime University of Constanţa	2013
Moise Mădălin-Vasile	University of Piteşti	2013
Lăcătuş Daniel	"Politehnica" University of Bucharest	2013
Eduard Grigoraş	"Ştefan cel Mare" University of Suceava	2014
Alexandru Mihai Ilie	Technical University of Cluj-Napoca	2014
Ovidiu Timoficiuc	"Ştefan cel Mare" University of Suceava	2014
Mădălin Moise	University of Piteşti	2014
Teodor Luchian	"Ştefan cel Mare" University of Suceava	2014
Robert Dobre	“Politehnica” University of Bucharest	2014
Radu Ciocovanu	“Gh. Asachi” Technical University of Iaşi	2014
Daniel Gheorghe	"Politehnica" University of Timişoara	2014
Traian Butaru	“Politehnica” University of Bucharest	2014

TIE 2015
Participants

"1 Decembrie 1918" University of Alba-Iulia
Constanța Maritime University
"Dunărea de Jos" University of Galați
"Gheorghe Asachi" Technical University of Iaşi
"Lucian Blaga" University of Sibiu
"Politehnica" University of Bucharest
"Politehnica" University of Timişoara
"Ştefan cel Mare" University of Suceava
Technical University of Cluj-Napoca
"Transilvania" University of Brasov
University of Oradea
University of Piteşti

"1 Decembrie 1918" University of Alba-Iulia

www.uab.ro

Academic coordinator

Emilian Ceucă emilian.ceuca@uab.ro

Contestants

Olelei Cristian	BSc.	cristiano_ole@yahoo.com
Hârbea Andrei	BSc.	has_andrei@yahoo.com
Dumitrescu Octavian	BSc.	dumitrescu.octavian23@gmail.com

Sponsored by

Continental
The Future in Motion

Constanța Marimite University

www.cmu-edu.ro

Academic coordinators

Mihaela Hnatiuc mhnatiuc@yahoo.com
George Zărnescu zarnescugeorge@yahoo.com

Contestants

Roxana Vladuță	BSc.	roxana0604@yahoo.com
Ghinda Sergiu	BSc.	Sergiu1703@yahoo.ro
Andrei Ionuț Odagiu	BSc.	odagiuionut@yahoo.com

Sponsored by

AFCEA INTERNATIONAL

“Dunărea de Jos” University of Galați

www.ugal.ro

Academic coordinator

Silviu Epure silviu.epure@ugal.ro

Contestants

Enache Dănuț	BSc.	enache.dani@ymail.com
Braharu Iustin	BSc.	justin.braharu@yahoo.com
Racovcen Pavel	BSc.	pavell_93@yahoo.com

Sponsored by

“Gheorghe Asachi” Technical University of Iaşi

www.tuiasi.ro

Academic coordinator

Constantin Barabaşa cbarabasa@etti.tuiasi.ro

Contestants

Onofrei Şerban	BSc.	onofreiserban@yahoo.com
Figher Ionuț	BSc.	figher.ionut@gmail.com
Huțanu Ovidiu	MSc.	ehutanu.ovidiu@gmail.com

Sponsored by

“Lucian Blaga” University of Sibiu

www.ulbsibiu.ro

Academic coordinators

Ioan P. Mihu ioan.p.mihu@ulbsibiu.ro
Cristian Opriş cristian.opris@continental-corporation.com

Contestants

Cocan Nicolae	MSc.	nicolae.cocan@gmail.com
Cocan Alexandru Ionuț	BSc.	cocanalexandru@gmail.com
Căpățână Mihai	BSc.	mihai654@yahoo.com

Sponsored by

“Politehnica” University of Bucharest

www.pub.ro

Academic coordinators

Paul Svasta paul.svasta@cetti.ro
Norocel Codreanu norocel.codreanu@cetti.ro

Contestants

Butaru M. Traian	BSc.	butaru.traian@gmail.com
Iliescu V. M. Mihai	BSc.	iliescumihai2012@gmail.com
Niculescu T. Vlad	BSc.	vlad.niculescu@cetti.ro

Sponsored by

"Politehnica" University of Timişoara

www.upt.ro

Academic coordinators

Aurel Gontean aurel.gontean@upt.ro
Marius Rangu marius.rangu@upt.ro

Contestants

Andrei Burta	BSc.	andrei_burta@yahoo.com
Alexandru Racheru	BSc.	racherualexandru@gmail.com

Sponsored by

Continental
The Future in Motion

"Ştefan cel Mare" University of Suceava

www.usv.ro

Academic coordinators

Eugen Coca eugen.coca@usv.ro
Adrian-Ioan Petrariu apetrariu@eed.usv.ro

Contestants

Luchian Teodor	BSc.	luchian.teodor@gmail.com
Maranciuc Florin-Bogdan	BSc.	fmaranciuc@stud.usv.ro
Cojocariu Gheorghe	BSc.	ghita.cojocariu@gmail.com

Sponsored by

Technical University of Cluj-Napoca

www.utcluj.ro

Academic coordinator

Liviu Viman liviu.viman@ael.utcluj.ro

Contestants

Truță Radu	BSc.	radu.truta@yahoo.com
Miclăuș Antoniu	BSc.	antoniu.miclaus@gmail.com
Voina Radu	BSc.	raduvoinag@gmail.com

Sponsored by

"Transilvania" University of Braşov

www.unitbv.ro

Academic coordinators

Gheorghe Pană	gheorghe.pana@unitbv.ro
Marius Carp	marius.carp@unitbv.ro

Contestants

Mihai Groza	BSc.	grozamihai90@gmail.com
Florin Dumitrache	BSc.	flow.dumi@ymail.com
Vlad Lupu	BSc.	lupuv.vlad@gmail.com

Sponsored by

University of Oradea

www.uoradea.ro

Academic coordinator

Adrian Şchiop aschiop@uoradea.ro

Contestants

Peter Zoltan	BSc.	zolybela@gmail.com
Gal Adrian	BSc.	djadrian29@yahoo.com
Paranici Andras	MSc.	andras.paranici91@gmail.com

Sponsored by

Celestica™ Solid partners. Flexible solutions.

CONNECT GROUP INTEGRATED SUBCONTRACTORS

PLEXUS® The Product Realization Company

University of Piteşti

www.upit.ro

Academic coordinators

Alin Gheorghiță Mazăre	alinmazare@yahoo.com
Ioan Liță	ioan.lita@upit.ro
Valentin–Cătălin Burciu	valentincatalinburciu@gmail.com

Contestants

Moise Mădălin - Vasile	MSc.	madamadalin01@gmail.com
Marin Ionuț - Alexandru	BSc.	ionut.alexandru.marin@gmail.com
Briceag Constantin – Laurențiu	BSc.	briceag.costin@gmail.com

Sponsored by

Dräxlmaier

TIE 2016
Silver anniversary of TIE!

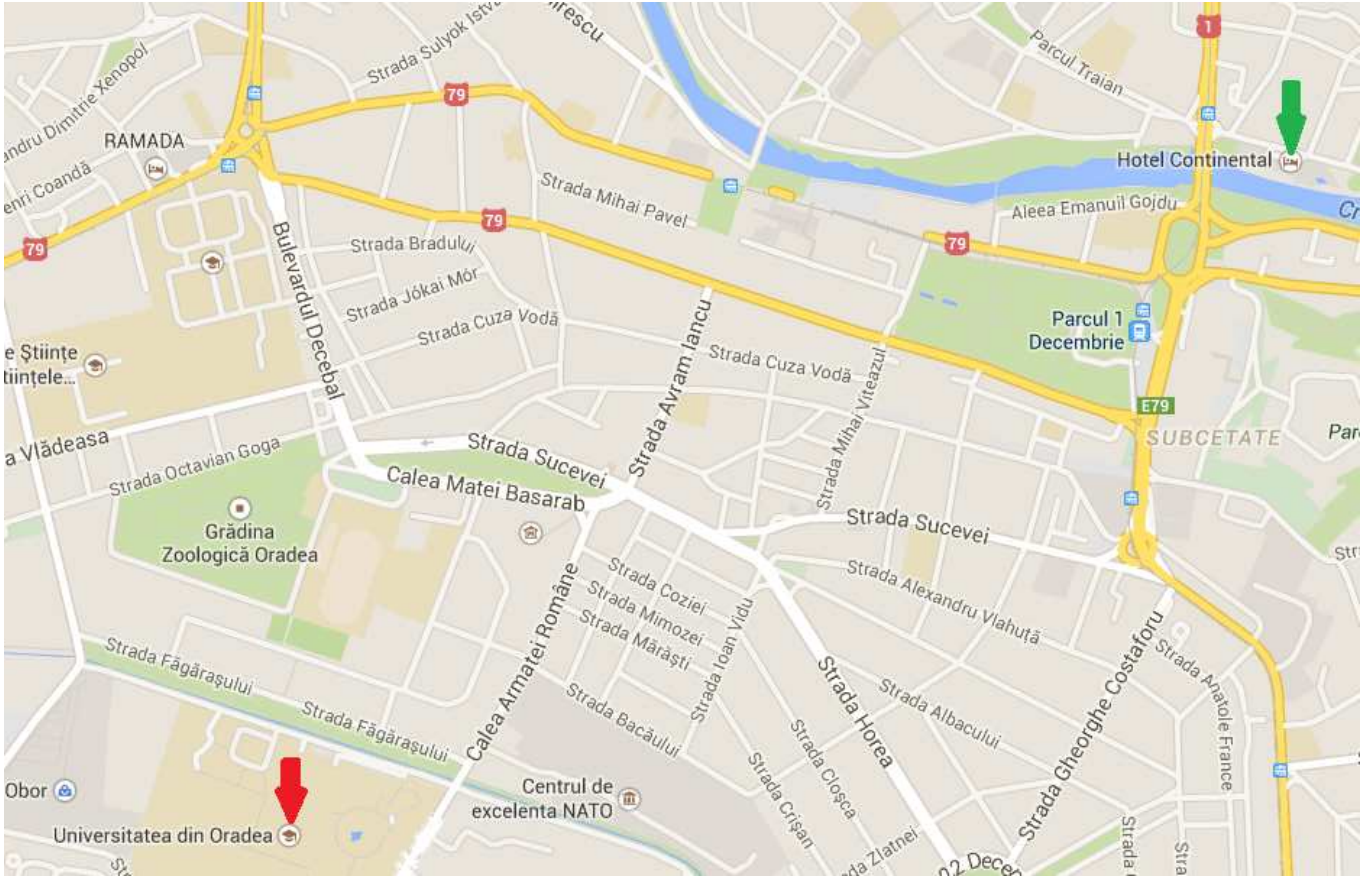
On behalf of the local organizing committee, I wish to address you all a warm invitation to Suceava, for the 25th edition of the TIE competition. Ştefan cel Mare University of Suceava (USV), founded in 1963, is one of the fastest rising universities in the Eastern Romania region providing higher education of high quality standards. It is one of the very few universities in this region with a comprehensive curriculum, including more than 100 programs at undergraduate, master, doctoral, and post-doctoral level from all five faculty areas (Arts & Humanities, Engineering & IT, Life Sciences, Natural Sciences and Social Sciences). At present, Ştefan cel Mare University of Suceava has 9 faculties, about 8.100 students, 330 academic staff and 300 administrative and auxiliary personnel. The Computers, Automation and Electronics Department, host of the TIE 2016 competition, is actively implied in developing the human resources in IT, automation, communications, and applied electronics, the base of the Romanian economy grow in the years to come.

Suceava is the 23rd largest city in Romania, with more than 92,000 inhabitants. For nearly 200 years, between 1388 and 1565, the city of Suceava was the capital of the Principality of Moldavia and the main residence of the Moldavian princes. The city was the capital of the lands of Stephen the Great, one of the pivotal figures in the Romanian history. Among the most picturesque treasures of Romania are the Painted Monasteries of Bucovina. Their painted exterior walls are decorated with elaborate 15th and 16th century frescoes, seven of them were placed on UNESCO's World Heritage list in 1993.

See you in Suceava!

Suceava, March 26th, 2015

Assoc. Prof. Eugen COCA, Ph. D.
"Ştefan cel Mare" University of Suceava
Head of Computers, Automation and Electronics Department
TIE 2016 Event Director


RAMADA
Hotel Continental
Parcul Traian
Aleea Emanuil Gojdu
Strada Mihai Pavel
Strada Bradului
Strada Jókai Mór
Strada Cuza Vodă
Bulevardul Decebal
Parcul 1 Decembrie
SUBCETATE
E79
Strada Sucevei
Calea Matei Basarab
Strada Avram Iancu
Strada Mihai Viteazul
Strada Octavian Goga
Grădina Zoologică Oradea
Strada Alexandru Vlahuță
Strada Coziei
Strada Mimozei
Strada Mărăști
Strada Ioan Vidu
Strada Fagărașului
Calea Armatei Române
Strada Bacăului
Strada Horea
Strada Albacului
Strada Gheorghe Costaforu
Strada Anatole France
Strada Cloșca
Strada Crișan
Obor
Universitatea din Oradea
Centrul de excelenta NATO

TECHNICAL SPONSORS

Celestica
Solid partners. Flexible solutions.

Continental
The Future in Motion

PLEXUS
The Product Realization Company

YAZAKI

MICROCHIP

SIEMENS

CONNECT GROUP
INTEGRATED SUBCONTRACTORS

Resonance Electronix

Miele

Electronica AZI

SPONSORS

Continental
The Future in Motion

Celestica
Solid partners. Flexible solutions.

Miele

ROHDE&SCHWARZ

PLEXUS
The Product Realization Company

MICROCHIP

EOC
ELECTRO OPTIC COMPONENTS

Comtest
Communications Test Systems

Dräxlmaier

TENSOR

ebs
an NTT DATA Company

KEYSIGHT
TECHNOLOGIES

InterNET
test & measurement systems
member of OFRIM Group

AFCEA INTERNATIONAL

CONNECT GROUP
INTEGRATED SUBCONTRACTORS

Association
SAPIENTIA ET VERITAS

NDS

UNIVERSITAS
GALATIENSIS

Universitatea Ştefan cel Mare Suceava

PARTNERS

UNIVERSITATEA DIN ORADEA
ROMÂNIA

FACULTATEA
INGINERIE ELECTRICĂ ŞI TEHNOLOGIA INFORMAŢIEI

CETTI

ETTI

POLITEHNICA

APTE

AFCEA

ARIES
Romanian Association for Electronic and Software Industr

IEEE CPMT
Hu&Ro Joint Chapter

IEEE
Romania Section

IPC

EPETRUN
Electronic Packaging Education Training and Research University Network