ȘTEFAN CEL MARE UNIVERSITY OF SUCEAVA
FACULTY OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
&
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 25th Edition, Suceava, 20th-23rd April 2016

Promoted by IEEE CPMT HU&RO Joint Chapter

Ştefan cel Mare University of Suceava Campus Map

2. EMC Laboratory

15. D101 Room - Building D / 1st Floor

15. ADL Room - Building D / 2nd Floor

17. USV Restaurant

23. E006 Room - Building E

24. Atrium - Building E

25. Aula Magna - Building E

Editors:
Prof. D.H.C. mult. Paul SVASTA, Ph.D.
Assist. eng. Cristina MARGHESCU, Ph.D.
Tehn. Delia LEPĂDATU

DESIGN OF ELECTRONIC MODULES & ASSEMBLIES

A WAY to turn your HOBBY into PROFESSION

www.tie.ro

Student Professional Contest
The 25th Edition, Suceava, April 20th - 23rd, 2016

Organized by:

ȘTEFAN CEL MARE UNIVERSITY OF SUCEAVA
http://www.eed.usv.ro/

POLITEHNICA UNIVERSITY OF BUCHAREST
http://www.upb.ro
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and supported by:

EPETRUN (Electronic Packaging Education Training and research Network)

TIE Event Program

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 of 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**
2017	Gh. Asachi Technical University of Iaşi
2018	University of Piteşti

TIE 25 - Happy Anniversary
Fugit irreparabile tempus!

We are now, after 24 years passed from the first TIE edition, at the beginning of the 25th one. It is hard to believe how fast the time was and is running, "Fugit irreparabile tempus"! Seeing from the position of what is TIE today, the first edition looks like a very naive children game. Even so, the first edition has a huge importance for all other editions. It was the start of the TIE story, maybe a nice story for many participants, students, teaching staff or industry engineers, and it was the start of an event (and its associated activities) which became, after many editions, a real brand for the electronics industry and academia in this part of Europe.

TIE tries consistently to highlight its motto: "A WAY to turn your HOBBY into PROFESSION". It was possible to be so successful thanks the excellent collaboration between academia, deeply involved in education and training of students, and the electronics industry involved in R&D&I activities. These two organizing "actors" act in a perfect synergy for all TIE participants. The result after many, many editions is obvious: the industry is happy (solid educated and trained human resource), the students are happy (very promising professional life after graduating the university), the teaching staff is happy (due to the perfect contact with the reality from the electronics industry involved in R&D&I). Under such circumstances, all the three TIE "nodes" (industry-students-teaching staff) are in a "win, win, win" situation and represent a real ***triple helix approach*** able to move on electronic packaging activities related to PCB design issues.

It is absolutely necessary to be highlighted that TIE has "born", as the next step in the "shaping" activities of our students, the TIE Plus event. Both events, TIE and TIE Plus, in the near future, will contribute to create the proper pool of professionals able to be involved in virtual prototyping activities. In fact, everyone is a winner!!! Of course, to become real winners behind all participants stay a lot of hard, even a very hard work. More than two thousand years ago Seneca philosopher said: ***"Per aspera ad astra"***. And it is still true, only with thorough hard work being possible to reach and touch the stars, in fact to become a real professional!

Finally, I have to thank all TIE participants (organizers, students, committees) for their commitments and I wish good luck to this "silver" edition and to the next many, many editions.

Bucharest, April 7, 2016

Prof. D.h.c.mult. Paul SVASTA, Ph.D.
TIE Initiator
Head of Center for Technological Electronics and Interconnection Techniques, Faculty of Electronics, Telecommunications and Information Technology, Politehnica University of Bucharest

Previous TIE Winners

Year	Name	University
2015	Luchian Teodor	Ştefan cel Mare University of Suceava
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 of 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

Dear participants and guests,

On behalf of the local Organizing Committee, I'm pleased to welcome you at the Ștefan cel Mare University of Suceava, at the 25th Edition of the TIE Contest. Ștefan 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). 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.

Welcome to Suceava!

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

Message from Prof. Valentin POPA, Rector of Ştefan cel Mare University of Suceava

The International Student Professional Contest **Interconnection Techniques In Electronics - TIE**, a traditional event for every electronics engineering student, and also for the representatives of the Romanian academic environment, gives the chance to all of us to focus on real design problems, validating the education given to our students in electronics. The latest TIE contest editions brought with us representatives of the business environment, people who have brought real added value to the competition. The combination of the requirements of companies with the academic rigor gave students the chance to work on real design projects, motivating them to emphasize their skills in working with modern computer design tools.

The contest is also o real environment for companies to meet, discuss, see at work, but also to recruit the best young layout designers. A price obtained in this contest by any student is one of the most important business card in this field. Most of the TIE winners, but also participants ranked not in the top at the previous editions, were employed in PCB design jobs in multinational companies, actively participating in the design of electronic devices that will equip future products. This demonstrates the contest acts as an incentive for all our students to learn more and more, and this is probably the most valuable benefit for them, for their schools and for their professors.

As the 25th Edition of the TIE Contest is hosted by the Stefan cel Mare University of Suceava, the only Romanian University of Bucovina country, I address you a warm welcome, and I assure you that we will try to be a perfect host. We also hope that you will have a great time in Suceava and that you will make many new friends who share YOUR passion for electronics.

Good luck to all TIE 2016 participants!

Prof. Valentin POPA, Ph.D.

25 in 1 (soul…)

Ness 2 in 1, sounds clearly, a good coffee… Ness 3 in 1, a newer version of the previous coffee solution, sounds also clearly… But TIE 25 in 1? What does it mean??? Let's see…

Beginning of 1992: a quite young engineer in joining the Prof. Paul Svasta's group, being skilled in a relative new field of electronics engineering, named EDA (Electronic Design Automation) or CAE – CAD – CAM (Computer Aided Engineering - Computer Aided Design, Computer Aided Manufacturing), the virtual environment of electronic modules/systems design, environment based on various new EDA tools on the market introduced in the middle of the '80s into the industry and academia, after the PC boom.

April 1992: Prof. Svasta is asking this young guy: "Noro, I see you have a good expertise in CAD, I am proposing you to establish together and start a CAD design contest for the students in our faculty. Do you agree?", "Professor, the computers of our network have only B/W monitor, no hard-disk and no mouse, but let's try…" At that time there were only six computers in the room and the participants were seven… Fortunately, one was in late and the first TIE edition was possible to run and to be finished (the name was taken from a discipline which was teached by the group, TIE – "Tehnologii de Interconectare în Electronică", "Interconnection Technologies in Electronics" in English; the name was slightly changed to "tehnici"/"techniques", in order to match better the design contest goals).

April 2016: a quite old (let's say mature…) professor is joining the 25th edition of TIE, after he fully or partially managed, from the technical point of view, all the previous 24 editions, being present at all these 24 events. The same emotions, nightmares that the subject is not perfect, great moments next to the participants and a true devotion to engineering, students and electronics industry.

The young engineer from 1992 and the (smiley) professor of today is the guy in the picture from below. At the "silver" edition, I can conclude, deeply touched, only like that: 25 (EDITIONS) in 1 (SOUL), A GREAT LIFE EXPERIENCE!!! Thank you all for making our 1992 dream possible! Good luck to everybody during TIE 2016!

Bucharest, 4th of April 2016

Prof. Norocel Codreanu, Ph. D.
Politehnica University of Bucharest
Technical manager of the TIE contest

TIE 2016 – "On the Shoulders of Giants"

Keeping the right proportions in mind, this is how it felt, years ago, when I first join the TIE contest – like standing on the shoulders of giants. The amount of experience that someone can gain, by attending TIE, cannot be measured – I guess most of my professional connections started there and, when backtracking the origins of my daily work, I find the same vertex.

Over the years, TIE was the place to meet the brightest minds in the field of Electronic Packaging, a place to learn continuously from my colleagues: whether it was about the openness of Prof. Norocel Codreanu, the attention to detail of Prof. Eugen Coca or the energy of Prof. Paul Svasta. It was also the place to meet finest professionals, the *crème de la crème* of Electronic Industry, some of them so skilled that they are living extensions of a CAD software (and I am not only pointing fingers to Marius Rangu). Finally, the students: you see them gathering on the first day and setting their computers, attending the contest preparation and, with all their enthusiasm, it is easy to miss the months of preparation and the hundreds of hours of intense work.

Then the contest starts and all of them, a perfect orchestra, are drawing, placing and routing with an almost un-natural grit and skill. And you know that this is the first day of their profession, you know that them, standing on the shoulders of giants, will see and reach further. TIE 2016, I wish you Godspeed!

Assoc. Prof. Gabriel Chindriş, Ph.D.
Technical University of Cluj-Napoca
Academic Co-Chair Industrial Committee

Message from IEEE CPMT Hu&Ro Joint Chapter Chair

Being among the organizers from the beginning, I had the possibility to see that TIE (Interconnection Techniques in Electronics) event was continuously grown, developed and why not, re-invented. Starting from o local contest at UPB in the first editions, has been addressed to many other Romanian Universities and even we had international participants from neighbor countries. The itinerant character of TIE also offered the opportunity to a better collaboration between Universities, that was concretized under the name: "Electronic Packaging Education, Training and Research University Network - EPETRUN". This national academic network has as major role to promote electronic packaging in the benefit of future engineers and companies. What now TIE has become, is a best practice of collaboration between Universities and Companies. In this sense, not only the tasks for contests are written accordingly to indications from companies but also the granted Certificates of PCB Designer came from an Industrial Committee.

This 25th Anniversary TIE Edition gives me the opportunity to speak also in the name of IEEE, a leading Professional Organization in the field of Electrical Engineering. As the topics related to TIE are in the field of electronic packaging, the IEEE CPMT Society, in particular through the HU-RO Joint Chapter has strongly supported the TIE contest. The TIE event complies with the Core Value of IEEE that is "Growth and Nurturing: encouraging education as a fundamental activity of engineers, scientists, and technologists at all levels and at all times; ensuring a pipeline of students to preserve the profession."

I had personally the possibility to see the perception of the TIE event, during the IEEE chapters report at ESTC Conference in 2014, in the presence of well renowned persons from IEEE staff. The report of the Hungarian - Romanian Chapter was the only that has awaked fruitful discussions, and all of the comments were very positive about TIE, in the sense of continuing and further developing the event.

Finally, on behalf of the Chapter that I represent, I hope that this year Anniversary 25th Edition of TIE to be a successful edition and to be a real success.

Prof. Ciprian IONESCU, Ph.D.
Politehnica University of Bucharest,
IEEE CPMT Hu&Ro Joint Chapter Chair

TIE is coming: it's SPRING!!!

Every year spring comes announced by snowdrops, violets, cranes and swallows. But for us, the members of EPETRUN, spring is associated with a more special symbol: **TIE**. This event marks the unique moment when new PCB designers bloom. And since the history of TIE goes back for **25 years**, we can say we already have a rich harvest in our orchard! I am convinced that this year's participants will also make the contest a spectacular show of blooming talent in the nature world of PCB design.

Prof. Dan PITICĂ, Ph.D.
Technical University of Cluj-Napoca
Junior Past Chair of the IEEE CPMT Hu&Ro Joint Chapter

25 Years of TIE Evolution

The innovations in electronics are reshaping and changing the world we live in, and we, as engineers, are bind to keep up with it. TIE contest is a means to do exactly that, to stay in touch with the latest trends in PCB design, and to allow students to express their creativity in this utmost important field.

I came in contact with TIE contest as a student, and now I am most honored to be part of the well-coordinated team that organizes it. It is TIE's 25th edition and its evolution is visible in the number of the participants that it is growing each year, in the involvement of the industry which is crucial for this contest, and last but not least, in the tools used for PCB design. Let us hope that this contest will be held many years to come.

Cluj Napoca, March 31, 2016

Lect. Eng. Liviu VIMAN, Ph.D.
Technical University of Cluj-Napoca

Over 25 years

A modern society is characterized by the impact of information technologies in all areas. These technologies have led to changing concepts in educational and research systems. Thus, one can not talk anymore of higher technical education without computer aided design, which must keep pace with the new production technologies, but also those of research and teaching.

The TIE contest is part of the strategy of those who participate, intending to have strong professional bodies at national and regional level. We are committed to build together something to last, so that this construction should rely on this: teaching, research and creative work at the highest level.

We are together within a community that equally needs the best teachers, researchers, but also the best students with whom, together, we will create the favorable development of this branch of engineering through a transmission and reception of the mysteries held by the electronic technology science. For the teaching staff we can notice an expanding collaboration with the business and research environment and also an increase in rewarding the deserving students for their good results.

The theme of this contest is an extremely accurate and substantiated one, that involves the collaboration between specialists working to generate up-to-date subjects for the competing students. This thing has generated the time endurance of the competition as well as highly qualified students who took part to it.

As for expressing the gratitude, they must be addressed to all and I would start with the involved students and their guiding teaching staff for their wonderful choice they made in the electronics area of interest. Special thanks must be also addressed to sponsors for organizing this event. They understood the long-term usefulness and effectiveness of the competition in the trilateral mechanism, learning-research-production. Let's not forget to thank the hosts of all editions of the competition. Not lastly we should thank Mr. Prof. D.H.C.mult. Paul Svasta, Ph.D., the initiator of this competition, for the force with which he contributed to the continuous development of this contest.

Piteşti, April 2, 2016

Prof. Ioan LIŢĂ, Ph.D.
Assoc. Prof. Alin-Gheorghiţă MAZĂRE, Ph.D.
University of Piteşti

Twenty-five years later

A quarter of a century ago, a small group of academics from the Bucharest School of Electronics and Telecommunications initiated the "Interconnection techniques in electronics - TIE" student contest. Soon afterwards, similar schools in Cluj, Timişoara, Iaşi and Piteşti got involved, and the contest gained national status. At present, the contestants come from all the schools of electronics in Romania and from some in Hungary.

A few questions are in order, such as what makes this contest popular? Why young and experienced academics alike - some of the latter do already retired - work for TIE without any "reward"? I believe that the explanations originate in the utility of this contest, on the one hand, and its scope, its ideal and the means of reaching these, on the other.

The need for TIE derives from its attempt to ensure practical, hands-on, experience, which is one of the pillars of technical education. In the 21st century this means having connections with the industry and everything that it stands for in electronics. (The other two pillars are theory and technology). Both production engineers and many academics are aware of this need, and out of a natural drive to do "what is necessary, good and useful", are willing to make endeavors in this respect.

The activities organized as part of the TIE contest are based on the ideal of the national electronic education's progress, in line with the requirements of the 21st century. Consequently, this kind of education is likely to attract more and more young people and to ensure their better and faster employment.

People need both ideals and aims in order to make endeavors, as well as inspirational words, people, and actions proclaiming and upholding these ideals. In other words, quoting Sadoveanu, "... people do not live only on bread". In my opinion, TIE offers much more than just bread. It offers a way of making one's purpose achievable, to the instructors who train the participants and to the student contestants who invest additional interest and effort.

Iaşi, March 3, 2016

Professor Vlad CEHAN, Dipl. Eng., Ph.D.
School of Electronics, Telecommunications and Information Technology
Gh. Asachi Technical University of Iaşi

25 Years of TIE? WOW!

I am very happy that I have the chance to share with you some thoughts of mine regarding the TIE event. And this time from a more personal point of view. I've been deeply engaged with TIE during the nineties when, as a student of Politehnica University, I participated in the 3rd and 4th TIE Contest editions (for the records, I won the 3rd prize with each occasion). I heard that a group of "rebels" led by Prof. Svasta organizes a sort of design contest and next day I was in! Besides academic/technical aspects I've been lured by the enthusiasm shared by CETTI team. The fact that PCB design was done at that time on black/white 14" monitors was not an obstacle. Despite I was following microelectronics specialization I considered that preparation for TIE contest and the contest itself could be beneficial for my formation as electronics engineer. I can tell you now that I was damn right!

After graduation I "switched the side" and I became for a period of time one of the organizers. People still ask me which side is more difficult, which one puts more pressure on you, etc. and ultimately which side I enjoyed the most. Well, the answer is BOTH. For instance, it's difficult for me to decide what is more challenging, to solve that very complicated subject in a very limited amount of time or, having plenty of time (!), to take care about everything which happens on the stage and behind the stage. What would be more rewarding, to get to the finals and win a prize or to see that the students you have trained decisively contribute now to the growth of the electronic industry throughout the country?

I am very pleased that something many people thought it's just a hobby of a couple individuals turned into an European event and a brand. In my opinion, the most important thing TIE does is that it brings together academia and industry that work together to prepare the new generations of engineers who are facing more and more challenging tasks.

Unfortunately, I cannot attend 25th TIE event: Microchip celebrates 10 years of activity in Romania in the very same week. However, it doesn't change the fact that TIE will always have its place in my heart.

Have fun at TIE 2016!

Bucharest, April 2, 2016

Daniel LEONESCU, Ph.D.
Engineering Manager
Microchip Romania Development Center

How TIE Changed My Life
(And How I Changed the Life of TIE)

When I was first introduced to TIE as an undergraduate student 14 years ago, all I knew about it was that it has something to do with PCB design - one of the many fields of engineering I was studying at that time. While PCB design was not my one and only passion, there are not many opportunities for an undergraduate student to prove himself to a wider audience, so I took this opportunity and joined the competition. I won that year and things changed for me, not as much because for a brief moment I was arguably the best PCB designer trained by a Romanian university (which can really boost someone's self-confidence), but because I suddenly became visible. Among others I became visible to prof. Horia Cârstea, who lead the Timisoara team for many years and asked me after the TIE adventure to join the faculty staff. Now, that really changed my life - 14 years later I have a PhD and a 13 years long academic career that was fulfilling in at least as many ways it was not.

The year 2002 was a turning point not just for myself, but I believe it was also for TIE itself, since it was the first time someone outside the organizer's team has won the contest. From that point it really became a national competition rather than a local one, and looking at the participants list of the latest editions, from that point it only moved forward.

I guess what I'm trying to say is that apparently small things, like joining a student contest, can have a significant impact over time. I KNOW that I'm not an exception and that many of the former TIE participants had a career boost after being part of this competition, and although winning is not as easy now as it was 14 years ago, the TIE event, which has developed into more than just a student contest, has become a real performance highlighter. That, I believe, is the most valuable asset of TIE.

So: happy anniversary, TIE! Thank you, prof. Svasta, for bringing TIE to life! Good luck to all participants! And enjoy :)

Timişoara, April 1, 2016

Marius RANGU, Ph.D.
CTO, RSX Engineering
Former lecturer at Politehnica University of Timişoara

The TIE Industrial Advisor Committee Chair Opinion

Started as a purely academic initiative, now, after 25 years of existence, the results of this framework is now returning in the performance of the actual electronic engineering community in Romania and has offered the preconditions for the companies to deploy engineering.

Thanks to the global technology boom present today in our domain, we owe to the future and actual engineers an environment that facilitates the increasing of capability in order to do development in the latest "state-of-art" from our field.

With the support and awareness sustained by the TIE academic community, our local professional engineering companies are invited and involved in the steering of the environment towards both today's needs but also the further development of know-how needed for deploying the future technologies with today's tools and know how.

Hence the next topic of interest for both environments, industrial and academic - TIE Plus - which addresses in particular the area of master and doctoral studies as well as expertise from the industrial environment.

Looking forward for the "high speed" coming future that will be developed thanks to the new hobby driven, but future professionals and experts, that hopefully will receive from the companies the right environment for boosting the drive that the challenge of the Electronics Olympics will show for the 25th time!

Cosmin Moisă
Electrical Engineering Discipline Responsible
Continental Automotive and
TIE General Industrial Co-Chair

TIE – an Opportunity for Electronics students to build a strong professional experience

Microchip Technology Inc. is a leading provider of microcontroller and analog semiconductors, providing low-risk product development, lower total system cost and faster time to market for thousands of diverse customer applications worldwide. Romania has been well known for several decades for the high level of professional education of our technical specialists. In 2006, Microchip decided to expand their activity opening a new R&D center in Europe, based in Bucharest.

Microchip's Academic Program demonstrates our ongoing commitment to support the education of the next generation of engineers. Our partnership with the Academia is intended to increase the awareness and knowledge of embedded applications in order to inspire the students to become the innovators of the future. One of our highest priorities is to build a strong relationship with the academic world, so as to evince the main needs of the commercial companies for proficient specialists, to support the professional development of the future electronic engineers but also to identify and train our future colleagues. This synergy has determined the continuous improvement of the quality of the graduate electronics in our country.

Ever since the beginning of its activity, Microchip Romania participated as a partner and/or sponsor at TIE. We have witnessed how the number of participants of this contest increased, and also how the subjects evolved in complexity. Over the last years, the contest extended out of the borders, becoming a solid ground on which a successful professional career can be developed.

Some of the winners of previous editions are now working for Microchip, colleagues whose knowledge and common values were highly appreciated when joining the company and which added a plus to our global team.

Now, at its 25th edition, a new dimension of the PCB design is being contested, TIE Plus focusing on virtual prototyping for high-complexity PCBs.

We would like to congratulate the organizers of the competition, especially Mr. Svasta for endeavoring to run this contest every year and for bringing together professors, students and representatives from commercial companies in order to stimulate the development of the interconnection techniques in electronics. Thanks to the knowledge gained once with the preparation for the event, the young college graduates are ready to be part of the company business and get involved in the development of high-performance electronic products, turning from an 'Olympic gamer' into a 'PCB designer'.

Bucharest, April 2, 2016

Delia CHIRICESCU
Director
Microchip Technology SRL

TIE - As opportunity for strategic dialogue

I'm very glad to see TIE reaching its 25th edition. This longevity speaks on its own about the sustainable growth of the event over the years, and we are proud and happy to be an active part of it.

We acknowledge the importance of such events for the development of the overall collaborative environment in the electronic field. It is a great opportunity for stakeholders to meet, share their experience and build bridges towards a strategic collaboration between the academia and the industrial environment.

To substantiate this idea, during the previous edition of TIE, in the discussion panels, the workshop *"Strategic partnership between university and electronic industry"* was born. It was included on the *SIITME - IEEE 21th International Symposium for Design and Technology in Electronic Packaging* agenda and we were honored organize, host and moderate this workshop. Industry, academia and politics representatives joined and unfolded potential solutions for sustaining the training of the future workforce with skills adapted to the rapidly changing electronic market requirements.

Multiple ideas were generated, working groups were created, an action plan is being developed and the implementation stage will follow. The main directions refer to closing gaps between theory and practice, financing, increasing human resources quality, and consolidating the dialogue and collaboration between academia and industry. At this TIE edition the first follow-up on the status of this common project is scheduled.

Therefore, I would like to conclude by saying that events like TIE provide great opportunities and a suitable environment for raising questions, brainstorming ideas, refining roles and taking responsibility for efficiently educating the future professionals in our field. As a result, we aim for a visible and tangible evolution for both the academia and the industry, with a focus on encouraging and sustaining performance, research, innovation and alignment with the trends of the electronic industry.

Braşov, April 4, 2016

Hartmut HOHAUS
Managing Director
Miele Tehnica

Partnership in Practice

First of all, congratulation for the 25th edition of TIE. It is important that, at this anniversary, university and business share a common vision regarding the future trends in the electronic industry.

I am very pleased to see our strategic partnership growing, as well as witnessing how industry and academia work together in order to achieve common objectives. This collaboration is critical as higher performance expectations and demands are being placed on graduates, raising questions about how to adapt the content of academic programs and pedagogical methods to best match the future needs.

One year ago, at TIE Oradea, we have launched a challenge and further embraced it afterwards, at SIITME Brașov. It is the challenge to join efforts throughout academia, industry and politics representative and work together as partners. All the involved parties agreed that the future of electronics can be ensured only by defining a common mission and building a partnership to support its achievement. This strategic partnership is key to building incremental trust and proficiency through a variety of projects and exchanges.

This new approach poses several obstacles and the road towards consolidating will not always be easy. But the conversation has started, the opportunity is here, and it is up to committed higher education professionals and motivated professionals from the industry to turn ideas and words into action. For this reason we have created three working groups at national level and here, at TIE, we are making a new step towards turning ideas into action.

I am looking forward to that and I am convinced this is just the beginning of our journey as strategic partners.

Brașov, April 4, 2016

Aurelia FLOREA
HR Director
Miele Tehnica

TIE – industry & academia co-driven best practice

At its 25th edition, the student contest "Interconnection Techniques for Electronics" represents a well-known brand for the Romanian electronic industry.

Foreign large multinationals and domestic SMEs are joining too at this event for its support, but especially to identify among the contesters their future human resources. In fact, TIE becomes industry-academia co-driven event.

For this, representatives of EPETRUN (Electronic Packaging Education Training and Research University Network), which is a network gathering, practically all Romanian universities involved in the education and training of electronic engineering, together with industry implicated in R&D&I activities are direct involved in establishing of contest subject, the assessment sheet including the evaluation of each participant.

A special emphasis is put on the strong business environment involvement for the work evaluation, and endorsement of the contest themes, parameters of evaluation and final awards. The business environment involvement is mainly thought to ensure the input from real life for which any engineering education program is dedicated. So the students are confronted not only with the highest theoretical knowledge of their area of competences, but also with real problems they have to solve soon at their jobs.

Finally, during the years, TIE evolved from a simple student contest to one of the most complex events, a best practice, of the university engineering programs of Romania, bringing people from the specific electronics competence area, from all around the world together to set friendships, trust and future project for mutual benefit. It is very impressive to see what pleasure and enthusiasm animate the people, students, university professors, or business representatives at the welcome or during the event.

Bucharest, April 11, 2016

Alexandru Borcea, President
ARIES, Romanian Association for Electronic and Software Industry

Message from Cristian Berceanu,

The winner of TIE 2004 edition

As opposed to previous generations, I and my colleagues were never faced with compulsory army conscription. Not joining the army prevented us from having a real ritual of becoming, from maturing in an environment where peer competition is the norm. Eventually, we all experienced adulthood in one way or another, and if I were to point to one of the events in my life which significantly contributed to that, it would be my participation as a student to the TIE 2004 edition.

Having joined university 4 years earlier, I knew nothing about electronics, let alone packaging and PCBs. Climbing the ladder of knowledge though, I first got into the hobby of electronics (a board with transistors and ICs was a kind of black magic back then) and then I was soon faced with the opportunity of participating in this competition to prove my recently acquired skills.

Contrary to the general opinion, in my view TIE is not primarily about electronic knowledge, but rather about setting a goal for yourself and then fulfilling it; about doing something all the way to the end; about competing with others and winning against all odds; about proving yourself and to the others that you can learn seriously, work under pressure and deliver in time.

All these are primary skills which form the foundation stone of a perfect engineering career. More than 10 years down the line, I realized that is what I am primarily looking for when interviewing engineers who apply for jobs with our company. We are looking for the ability to learn and solve engineering problems (more than looking for specific knowledge in various fields of electronics).

Attending TIE and scoring a good place is an excellent way of proving all these both to yourself and to the others around you. And doing so will also give you memories which you will cherish, well…forever.

It is now my pleasure to attend TIE as member of the Industrial Advisor Committee, giving back a little of what I have received and being a small wheel in bringing forward not only this competition, but the entire engineering community (and hence Romanian society) as a whole.

Timişoara, 28 March 2016

Cristian BERCEANU,
Hardware Engineer
Yazaki Component Technology Timişoara

Transforming Engineering Education through Electronic Technology and TIE

It is my pleasure and great honor to congratulate TIE and people behind TIE at the 25th anniversary of TIE. Each year, for us, TIE is an important event in the professional life. We try to follow the high rank of this event, and each time we are discovering new complex and useful features of what means today the electronic engineering and technology. We have learned electronic packaging and electronic technology but we got also knowledge that is not written in books and skills outside of the visible area. We saw that people of electronic technology are special, they use simple concepts and elements to describe complex structures and to introduce us what they see over the horizon. We use these aspects of the technology as check-in gates for electronic engineering and education. On behalf of the Electronics Department, I would to like to thank people involved in TIE, both professors and students.

Galați, March 31, 2016

Prof. Dorel AIORDĂCHIOAIE, Ph.D.
Electronic and Telecommunication Department
Dunărea de Jos University of Galaţi

TIE a dream come true

Professor Paul Svasta's vision, 25 years ago, of the development of the electronic packaging domain in Romania had become, slowly but surely, a reality. The involvement of many electronic companies in the Contest proves that the students' training is going in a good direction. The aim of TIE is to bring together academics and industry. In our University, TIE has had a good impact as every year the students prepare to compete with their colleagues.

"TIE, I wish you to become known everywhere!"

Constanţa, March 29, 2016

Assoc. Prof. Mihaela HNATIUC, Ph.D.
Constanţa Maritime University, Romania

TIE a challenge for academic and industry partnership

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. As members of the Romanian technical academic staff, we should all be aware that a very important target in near future is to develop a strong network that promotes the development of human resources for innovation.

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.

So, the Electronics and Telecommunication Department from University of Oradea will remain deeply involved in developing a strong connection between industry and technical academic courses focusing on electronic packaging and will support further the developing of TIE and TIE Plus.

Prof. Cornelia Emilia GORDAN, Ph.D.
Prof. Nistor Daniel TRIP, Ph.D.
University of Oradea

What means TIE for Braşov?

After the meeting, on March 6th, 2008, at CETTI Bucharest, 9 TIE editions followed, each bringing something new. In 2008, during the practical lab Simulation Techniques classes, students were drawing circuits and performing SPICE simulations. Then we gradually introduced PCB design.

At our first participation in 2008 at the 17th TIE edition in Pitesti, we formed a team of enthusiastic students and self-taught CAD software individuals. Later I taught students interested in electronic packaging and I organized the local stage selection of the most skilled of them. I realized over time that my role is of an informative nature regarding the TIE issue and the presentation of the basic dedicated CAD concepts. The success that follows is the individual effort of the participants.

Braşov, March 31, 2016

Assoc. Prof. Gheorghe PANĂ, Ph.D.
Transilvania University of Braşov

TIE, a great experience for future professionals

My first contact with TIE was in 2008 as a participant student. Since then, the contest has significantly evolved both in subject complexity and strategic partnerships. As a participating student I found that the intense training preceding the event was one of the most fulfilling learning experiences I had during my university years. This can only be achieved by combining the passion of students and the continuous dedication of academic coordinators.

Over the last years, due to the large involvement of the industry partners in supporting and promoting this event and the dedication of the organizing and steering committees, TIE has become a trademark for excellent PCB design skills of future professionals. TIE is a great chance for students to get in touch with realistic industry demands and take a first step towards a fulfilling carrier.

Timişoara, April 4, 2016

Cătălin NEGREA, Ph. D.
Team Leader - EE Simulation Timişoara
Research & Development Electronic Engineering
Continental Automotive Romania

Personal perceptions about TIE

TIE is great opportunity to make new friends, meet new people and get to know renowned professors. I participated for the first time in 2012. Five years ago there were few students from Oradea interested in this competition, but year after year their number increased not only for the prizes awarded to the winners but also by the chance to earn the "PCB Designer" certificate which provides a starting boost to a successful career. Besides, the contest subjects, developed in recent years by industry, ask participants to find solutions to real problems of modern industry.

I would like to emphasize the leading contribution of professor Svasta in promoting and organizing this contest over the years - reaching its 25th milestone edition - and his efforts to gather around him universities that have programs and specializations in the field of electronics.

Oradea, April 3, 2016

Lect. Eng. Adrian ȘCHIOP, Ph.D.

University of Oradea

A perspective of TIE contest

My first contact with TIE defined the future of what I became now. In 2008 I heard for the first time about this contest and was the first year as a participant. I thought that will be something amazing and in fact it really was. My first year was only for accommodation, having no experience in this field, but I was fascinated about the word of the PCB designers and what they can do with all electronics nowadays. In 2009 I took the 2nd place and everything changed for me. So, I wanted that other students can feel the same joy and happiness that I felt in that day.

Since then I begin my activity as a trainer in this field, choosing the academic path for my future career as a link between students and this competition. At the beginning were only 3 students interested but now the training activity for TIE has more than 30 students (from 1st to 4th year of study) and each year I see more interest from all kind of students from different study programs. Some of the students have some knowledge in this field but some are starting from the beginning, learning for the first time the role of electronic components into a schematic and what is necessary for creating a good quality PCB layout.

I'm glad that I started a new perspective regarding this competition and I hope in the future to have more students that are able to learn the "hidden secrets" of the PCB designing process.

I wish to all the participants at the 25th silver edition of TIE good results and a great future in this branch!

Suceava, April 5, 2016

Lect. Eng. Adrian-Ioan PETRARIU, Ph.D.
Ştefan cel Mare University of Suceava

TIE - A Great Start for Your Career

TIE contest is a great way to share your passion and knowledge in the electronics field. Year by year, the diversity of the subjects proves that the PCB Layout it is a comprehensive area with a lot of challenges. The fact that there are a lot of companies fighting for the TIE participants is a good sign that this event is an important step in the beginning of your career.

One of my teachers from the university once told me that winning TIE does not make you a PCB Layout specialist. After almost 9 months since I started my first full time job in this domain, I can now endorse his words. After participating at TIE, no matter if you win or not, you have a lot more to learn. That is why it is important to be open minded and always be willing to acquire more information. I want to share with future competitors a few **Steps to reach a top ranking at TIE,** which I have learned from my own experience:

- Get used to TIE requirements by solving subjects from the previous years
- Get used with the CAD tool and do not change it right before the contest
- Try to keep the same setup (computer, monitor, keyboard, mice) as the one from your home
- Read carefully the subject and focus on the important points
- Use highlighters to underline the main tasks from the subject
- Check carefully the datasheets and all the received files
- Do not panic and do not waste your time; if you are not able to solve a problem try to leave it for later and do something else
- Try to optimize every action and win more time for other tasks
- Be organized, keep your mind clear

For me it was very useful to participate at TIE 2014. It helped me to get used with the contest flow and I found some of my weak points. That really motivated me to improve my performance in the next edition.

After winning TIE 2015, it was easy for me to find a good job. This proves that TIE really is “A WAY to turn your HOBBY into PROFESSION”.

Timișoara, April 5, 2016

Dipl. Eng. Teodor LUCHIAN
TIE 2015 Winner
Continental Automotive Timișoara

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TIE 2016 Program

<table>
<tr><th colspan="4">Thursday, April 21, 2016</th></tr>
<tr><th></th><th>“Students” Track</th><th>“Steering Committee” Track</th><th>“Technical Committee” Track</th></tr>
<tr><td>08:00-10:00</td><td colspan="2"></td><td rowspan="3">Technical meeting
(local members only)
E006 Room
Building E</td></tr>
<tr><td>9:15</td><td colspan="2">Gathering for Suceava Round-trip
Atrium Lobby, Building E</td></tr>
<tr><td>10:00-12:45</td><td colspan="2">Suceava Round-trip</td></tr>
<tr><td>12:45- 13:30</td><td colspan="3">Lunch
USV Restaurant</td></tr>
<tr><td>13:00- 14:00</td><td colspan="3">Registration of the participants
Atrium, Building E</td></tr>
<tr><td rowspan="2">14:00-18:50</td><td colspan="3">Opening Ceremony
Aula Aula Magna, Building E</td></tr>
<tr><td colspan="2">International Workshop
„PCB Design Strategy for the Electronics Automotive Industry”
Aula Magna, Building E</td><td>Technical meeting
E006 Room
Building E</td></tr>
<tr><td>18:50-20:00</td><td colspan="3">Student Technical Session
Aula Magna, Building E / Atrium, Building E</td></tr>
<tr><td>20:00-21:00</td><td colspan="3">Dinner
USV Restaurant</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
ADL Room, Building D</td></tr>
</table>

Friday, April 22, 2016			
07:00-07:30	Breakfast USV Restaurant		**Technical preparation** E006 Room Building E
07:30-08:00	**TIE 2016 contest preliminary activities** Atrium, Building E		
08:00-12:00	**TIE 2016 CONTEST** Atrium Building E	**09:00-11:30** **Panel Discussion: Parnership in Practice** Aula Magna Building E	**Technical session** E006 Room Building E
12:00-13:00	Lunch USV Restaurant		
13:00-17:45	**Assessment of the TIE 2016 projects** Atrium, Building E		
17:45-18.15		**Steering committee meeting** D101 Room Building D	
18.15-19.50	**TIE 2016 - Awarding ceremony** Aula Magna, Building E		
20:00-22:00	Gala dinner TIE 2016 Hotel Balada Restaurant		

Saturday, April 23, 2016	
07:30-08:30	Breakfast
09:00-12:00	Ending session / Final remarks D101 Room Building D

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

Workshop

„PCB Design Strategy for the Electronics Automotive Industry"

April 21, 2016

13:00-16:30	***Registration***
14:00-14:30	**Welcome TIE:** *Prof. Valentin POPA, Ph.D., Rector of the Ştefan cel Mare University of Suceava* *Prof. Dr. h. c. mult. Paul SVASTA, Ph.D., President APTE*
14:30-16:00	***First Session: Advance Topics in PCB Design*** *Session chairs:* *Prof. Dan PITICĂ, Ph.D., Technical University of Cluj Napoca, Romania* *Cătălin NEGREA, Ph.D., Continental Automotive Sibiu*
14:30-15:10	Important Design Considerations for Flexible Circuits **Joseph FJELSTAD,** CEO, Founder, Verdant Electronics, Seattle, Washington, USA
15:10-15:50	How to fit a whole electronics lab workbench to the size of a credit card **Eng. Claudia GOGA,** Digilent RO, Cluj-Napoca, Romania
15:50-16:30	Thermal design improvement for reliability in automotive electronics systems **Aurelian BOTĂU,** IID-HMI, Continental Automotive Timişoara
16:30-17:00	***Networking Break***

17:00-17:40 ***Second Session: Virtual Prototyping***

Session chairs:

Prof. Vlad CEHAN, Ph.D., Gh. Asachi Technical University, Iaşi

Joseph FJELSTAD, CEO, Founder, Verdant Electronics, Seattle, Washington, USA

17:40-18:15 Electromagnetic Simulation of Electronic Devices

Matthias TRÖSCHER, Ph.D., Business Development Manager, CST AG, Munich, Germany

18:15-18:50 TIE Plus. The new PCB simulation challenge

Cătălin NEGREA, Ph.D., Team Leader - EE Simulation TSR Instrumentation & Driver HMI, Research & Development Electronic Engineering, Continental Automotive Romania

Student Technical Session

Aula Magna, Building E / Atrium, Building E

Session Chairs:

Prof. Norocel CODREANU, Ph.D., Politehnica University of Bucharest

Lect. Eng. Adrian-Ioan PETRARIU, Ph.D., Ştefan cel Mare University of Suceava

18:50-19:20 TIE 2015 subjects - Teodor Luchian, TIE 2015 winner

19:20-20:00 Set-up and checking of contest computers, CAD environments

Panel Discussion: Partnership in Practice

April 22, 2016, 09:00-11:30

- Aula Magna, Building E -

Session Chairs:

Dan PITICĂ, Dean of the Faculty of Electronics, Telecommunications and Information Technology, Technical University of Cluj-Napoca

Hartmut HOHAUS, General Manager Miele Tehnica SRL

09:00-09:30 ***Short overview regarding Strategic Partnership and our journey so far***

Aurelia FLOREA, Human Resources Director Miele Tehnica SRL

9:30-10:30 ***Results from working groups***

Aurelia FLOREA, Human Resources Director Miele Tehnica SRL

Vlad CEHAN, Professor at Gh. Asachi Technical University, Iaşi

10:30-11:00 ***Next steps and action plan***

Panelists:

Cosmin MOISĂ, Electrical Engineering Discipline Responsible Continental Automotive, Timişoara

Cătălin NEGREA, Team Leader - EE Simulation TSR, Continental Automotive Sibiu

Radu BOZOMITU, Professor at Gh. Asachi Technical University of Iaşi, Romania

Alexandru BORCEA, President of Romanian Association for Electronic and Software Industry

Mihaela HNATIUC, Professor at Maritime University of Constanţa

Aurelia FLOREA, Human Resources Director Miele Tehnica SRL

Bogdan MIHĂILESCU, Manager Association for Promoting Electronic Technology, Bucharest

10:30-11:00 ***Summary and conclusions***

Aurelia FLOREA, Miele Tehnica SRL

TIE 2016

DESIGN OF ELECTRONIC MODULES AND ASSEMBLIES

Student Professional Contest

Awarding Ceremony

April 22, 2016 - Aula Magna

18:15-18:30 ***Registration***

18:15-18:30 ***Opening Ceremony Speeches:***
Assoc. Prof. Eugen Coca, Ph.D., Ştefan cel Mare University of Suceava, ***TIE 2016 Chair***
Dipl. Eng. Alexandru Borcea, MBA, President of Romanian Association for Electronic and Software Industries

18:30-18:50 ***Keynote speaker***
"An overview over Electronic Manufacturing Technology evolution and trends"
Joseph Fjelstad, CEO, Founder, Verdant Electronics, Seattle, Washington, USA

18:50-19:00 ***State of the art TIE 2016***
Prof. Norocel Codreanu, Ph.D., Politehnica University of Bucharest,
TIE Technical Committee Chair

19:00-19:30 ***TIE 2016 Awarding***
Prof. Dr.h.c.mult.Paul Svasta, Ph.D., Politehnica University of Bucharest,
TIE General Chair
Prof. Dan Pitică, Ph.D., Technical University of Cluj Napoca,
TIE General Academic Co-Chair

19:30-19:40 ***PCB Designer Certification recommended by TIE Industrial Committee***
Dipl. Eng. Cosmin Moisă, Continental Automotive Timişoara,
TIE General Industrial Co-Chair
Assoc. Prof. Gabriel Chindriş, Ph.D., Technical University of Cluj Napoca,
TIE Industrial Advisor Committee Academic Co-Chair

19:40-19:50 ***Looking Forward TIE 2017***
Prof. Tecla Goraş, Ph.D, Gh. Asachi Technical University, Iaşi, ***TIE 2017 Chair***

TIE 2016 Gala Dinner (Hotel Balada Restaurant)

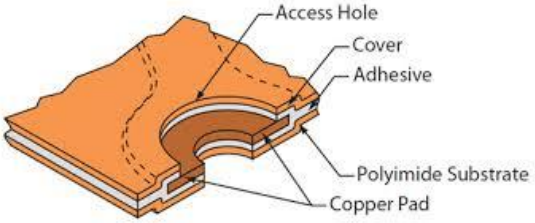
Important Design Considerations for Flexible Circuits

Abstract: Flexible circuits are one of the most useful and versatile electronic interconnection mediums. However, they are also potentially one of the most unforgiving. Decisions made in the design process can have a profound impact both in the manufacture of the designs and in their use. This presentation will inform participants about some of the more important considerations that must be accounted for in a design to greatly improve the potential for a successful first pass yield and long term reliability of the finished product in the field

Keyword: Flexible circuits, flex circuit design principles

The design process is arguably the most important step in the manufacture of any product. If the designer does not get the design right, the product has little to no chance of being viable. This is especially true in the manufacture of flexible circuits. The thin and often delicate materials used in the manufacture of a flexible circuit can be easily damaged both during fabrication, affecting yield and in use in the product for which they are designed to serve.

This seminar will alert the designer to key aspects of flex circuit design which can make or break the product. The participants will learn for example, what types or copper are available and which type of copper is best for which applications and why specifying copper grain direction is important. The designer will also learn what they can do to help manufacturing by managing copper distribution how best to route copper traces in bend, flex and fold areas.



Single metal layer flex circuit construction

As electromechanical interconnection devices, the participant will also be given an appreciation of how to foresee and address problems where the mechanical and electrical needs of the design are in conflict. An appreciation of many other aspects of flexible circuit design will also be given.
In order for the designer to better appreciate the challenges face by manufacturing, the presentation will also provide a brief overview of flex circuit manufacturing processes.

About the presenter: Joseph (Joe) Fjelstad, founder and CEO of Verdant Electronics, is 45 year veteran of the electronics industry and internationally known expert in the field of electronic interconnection technology. He is a serial entrepreneur and certain of the concepts found in his 175 plus US patents are also found in nearly every electronic device manufactured today. Joe is also an author or coauthor of several books on electronics manufacturing and IC packaging technology including: The *Printed Circuit Handbook, 7th Edition (2016*) and *Flexible Circuit Technology, 4h Edition (2012),* both of which are the most widely read references on the topics and *Electronic Packaging and Interconnection Handbook, 4th Edtion and Chip Scale Packaging For Modern Electronics* . He has given lectures at numerous universities and researcher centers including CERN and NASA-JPL and has keynoted several electronics conferences.

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How to fit a whole electronics lab workbench to the size of a credit card.

Abstract: A USB scope was designed. The specs were set to maximize the performance to cost ratio, resulting in one of the most challenging design projects. The workshop presents some of the engineering problems and the way they were solved.

Keyword: USB scope, mixed signal design, low power, high resolution/high sampling rate analog to digital and digital to analog conversion.

In the late years, a large academic and industry community assumed the mission of changing the way of teaching engineering in electronics and computer science: students should be provided direct and unlimited hands-on experience to the latest technologies, by affordable, easy to use, well documented hardware platforms. There are many evaluation boards provided by IC manufacturers to emphasize their products, but they are not specifically designed for education. High quality lab equipment is expensive and might be used by universities in limited quantity, but is prohibited for student's ownership. The presentation refers to an education targeted instrumentation device, intended to be a student lab workbench for studying analog and mixed signal circuits.

The design specifications and goals are impressive: two differential channel scope, two channel random signal generator, both 14 bit resolution, 100MSPS. 16 digital lines to be used as either or both pattern generator and logic analyzer, at 100MSPS. Dual user power supply. The instrument should be USB powered and designed on a single PCB, of the size of a credit card.

Fig. 1. The PCB of the device

The design challenges are obvious: high efficiency switching power supplies and high speed digital signals in very close proximity of low noise, low distortion analog signals. High speed, low power analog circuitry. Low crosstalk at high frequency and high impedance nodes. The user power supplies need to be protected against overload and reverse powering and should be stable over a large range of voltage and load. The instrument should be "student proof", i.e. robust enough to protect itself and the host PC against every possible misconnection within a large voltage range experimental environment.

The workshop shows some of the solutions used by the designers to achieve all the goals above.

About the presenters: Mircea Dăbâcan, professor in the Applied Electronics department of the Technical University of Cluj-Napoca, met the Digilent founders in Pullman, Washington, USA, in 1999, when he worked as visiting professor at Washington State University. Back in Romania, he continued his academic co-operation and founded the Romanian branch, Digilent RO, in 2006, to do research and design engineering.
Claudia Goga graduated in 2006 at the Technical University of Cluj-Napoca. She is a winner of the first edition of the Digilent Design Contest in 2005. She was hired in the founding team of Digilent RO. She is the senior R&D HW engineer for instrumentation product family at Digilent RO, with strong experience in mixed signal design.

Cluj-Napoca, March 28, 2016

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Digilent RO
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Thermal design improvement for reliability in automotive electronics systems

Abstract: Automotive industry nowadays is one of the key industries of our society. Now this industry is using more electronics devices and modules than ever before. All of these electronics equipments are using a significant amount of power and generating a considerable amount of heat which has to be extracted from the electronic system to achieve optimal functionality and reliability over time. Since miniaturization is also a key factor and the systems are using more and more powerful electronic devices, the thermal management of equipments becomes a serious problem and the thermal design is a must. In this presentation we focus on the need of thermal design for automotive electronics systems and some examples of thermal design implemented at PCB level and of course at system level.

Keyword: Thermal design, instrument cluster, PCB, simulation.

Automotive electronics systems are using more and more power and are generating a lot of heat which need to be extracted efficiently in order to maintain the functionality and achieve reliability. Systems like instrument clusters and central displays are getting more and more complex, having powerful graphic controllers, DDR memories and power supplies, integrated usually on a single main PCB. All this elements are considerable heat sources if we take a look at their power dissipation in typical application operation.

Having in consideration that the automotive operating temperature range is -40 to 85 deg C we can see that the worst case regarding the thermal aspect is the ambient temperature close or equal to the upper limit of this interval. In these conditions the electronics can reach critical temperatures due to self heating and without a proper thermal design reliability or even functional issues can appear.
A modern instrument cluster has a total power dissipation of more than 15W which generates a significant amount of heat and critical

temperatures close to 150 deg C can be reached by high power dissipation components at an ambient temperature of 85 deg C. Thus a good thermal design is mandatory.

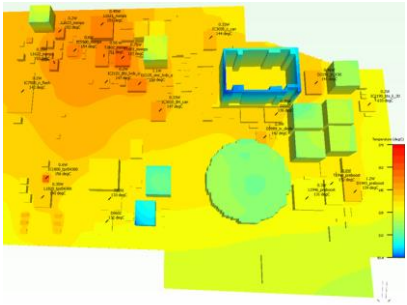

Fig. 1. PCB surface temperature

This thermal design is analyzed using finite element method thermal simulations. Usually several thermal simulation loops for design optimization are performed before building and testing a prototype. In this presentation we will talk about the thermal design concept, heat transfer methods, major heat sources on automotive PCBs and we will give some examples of thermal design from the simulations results.

About the presenter: Aurelian Botău, thermal simulation responsible at Interior Instrumentation and Diver - Human Machine Interface, Continental Automotive Timisoara. He has an electrical and electronics engineering background and is specialized in the numerical FEM simulation field and Thermal design. Aurelian is also an author or coauthor of several technical papers on electronics process modeling and simulation including: The *PCB Layout optimization for LED backlight module using FEM Simulation (2013*), *Electrical and Thermal Behavior for DC and Pulsed Stress on Chip Resistors (2014)* and *Electro-Thermal Analysis of Flexible Micro-Heater (2015),* all of them presented at IEEE international conferences.

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Electromagnetic Simulation of Electronic Devices

Abstract: Modern electronic devices contain printed circuit boards with high speed interfaces, which make signal integrity and power integrity simulations indispensable before prototyping. The presentation will give a short overview over prerequisites, workflows and the effect of SI and PI on electromagnetic compatibility.

Keyword: PCB, SI, PI, EMC, EMI

While signal integrity simulations are state-of-the-art in industry since many years, a combination of SI, PI and EMC engineering was either not done in the past or often associated with numerous measurements.

Measurements are usually applied late in the design process as they require working prototypes which are not available for a long time. When problems arise in the tests, a lot of effort has to be spent on troubleshooting in order to pass the test e.g. by applying some countermeasures. Often the source of the problem is still undetected and only the symptoms are mitigated. This approach can be very cost intensive as changes to the design at a late stage of the design process may require extremely high effort.

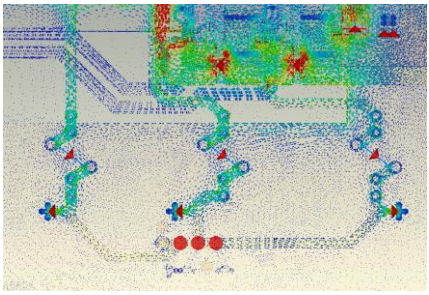

Fig. 1. Current density distribution

Simulation is a reasonable and well-established method to overcome such issues. This presentation will give an overview of common methods and methodologies used for SI, PI and EMC simulations. The workflow is explained on generic examples and depicted on real-world applications.

One highlight which will be mentioned in the presentation is the cooperation of CST with the German mid-sized company FESTO. The idea for this cooperation came up during a conference when some engineers asked themselves how well EMC simulation and measurements can be matched on a realistic demonstrator board.

FESTO is a leading world-wide supplier of automation technology and performance leader in industrial training and educational programs. In this project, CST brought in experience in 3D EMC/EMI simulations and FESTO provided the layout, the hardware, and the EMC measurements.

About the presenter: Matthias Tröscher received a Diploma in physics from the Technical University Munich, Germany, in 1994, and a Ph.D. degree in the Doctoral Program of Engineering Sciences from the Johannes Kepler University Linz, Austria, in 2000 for research at BMW AG on radar technology and signal analysis of pre-crash sensors. In 2009 he joined CST AG in Darmstadt, Germany. His main interest is on SI, PI, and EMC analysis with focus on automotive applications.

Munich, 06.04.2016

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TIE Plus.
The new PCB simulation challenge

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: TIEplus, electro-magnetic simulation, signal integrity

During the last year's TIE workshop a new contest stage was defined and presented as extension of the traditional TIE, focused on simulation technologies for PCB design. The newly born concept became reality on the 6th of November 2015 as the first edition of TIEplus. The subject required the signal integrity simulation of a multi-board video acquisition system. After a 2 week solving period, the contestants met at the Stefan cel Mare University of Suceava and presented their solutions to the technical committee in an open meeting. Each solution was discussed and potential improvements were outlined. Finally, a ranking of the constantans was established.

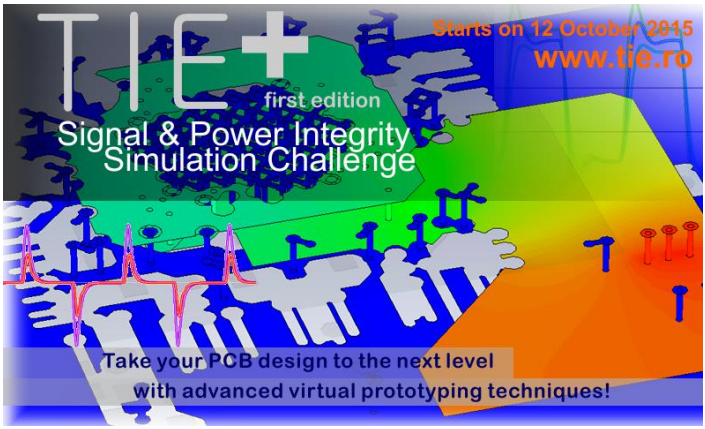

Fig. 1. TIEplus first edition poster

This workshop session will cover a brief review of the first TIEplus edition and the next steps in the implementation of future editions.

TIEplus can be seen as one step further in the direction of promoting high level expertise in the field of electronic packaging. The aims is 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.

About the presenter: Catalin Negrea is the initiator and coordinator of a virtual prototyping team in Continental Automotive, Interior Division, focused on the development of high-end design solutions for automotive clusters. In 2013 he was nominated as a company level expert in the field of signal and power integrity.
He obtained a Ph. D. degree from the Politehnica University of Bucharest in 2013, with a thesis focused on multidisciplinary modeling and electro-thermal simulation of active devices. Catalin is the author of 12 scientific papers in the fields of thermal management and signal integrity.

Timişoara, April 4, 2016

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Recognition by the industry of students competence in PCB design

TIE 2016 Certificate of Competence

The „PCB Designer" certificate is awarded, after evaluation, by the TIE IC (Industrial Committee) to selected participants as recognition of the high level of knowledge in the field of CAD for development of electronic modules and assemblies. The certificate is offered under the "umbrella" of the Association for Promoting Electronics Technology, APTE.

TIE Industrial Committee
Recommended PCB designers from 2010-2016

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
Lupuţ 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
Burgheaua Mihai	Ştefan cel Mare University of Suceava	2010
Knizel Alexandru	Politehnica University of Timişoara	2010
Pandelică Ovidiu	University of Piteşti	2010
Caracaţeanu Cătălin	Dunărea de Jos University of Galaţi	2010
Ţibuleac 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
Ţibuleac 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

Caracaţeanu Cătălin	Dunărea de Jos University of Galaţi	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
Teodor Luchian	Ştefan cel Mare University of Suceava	2015
Maranciuc Florin Bogdan	Ştefan cel Mare University of Suceava	2015
Moise Mădălin Vasile	University of Piteşti	2015
Paranici Andras	University Of Oradea	2015
Cojocariu Gheorghe	Ştefan cel Mare University of Suceava	2015
Butaru Traian	Politehnica University of Bucharest	2015
Marin Ionuț - Alexandru	University of Piteşti	2015
Cocan Nicolae	Lucian Blaga University of Sibiu	2015
Burta Andrei	Politehnica University of Timişoara	2015
Dumitrache Florin	Transilvania University of Braşov	2015
Iliescu Mihai	Politehnica University of Bucharest	2015
Voina Radu	Technical University of Cluj-Napoca	2015

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Continental develops intelligent technologies for transporting people and their goods. As a reliable partner, the international automotive supplier, tire manufacturer, and industrial partner provides sustainable, safe, comfortable, individual, and affordable solutions.

Continental Automotive in Romania

In Continental Automotive Romania, over 8000 people work in the R&D centers in Timisoara, Sibiu, Iasi and Brasov and in the production plants in Timisoara, Sibiu and Brasov. Our engineers develop software solutions, hardware and mechanical designs for body, safety, engine and transmission applications as well as navigation systems and instrument clusters for future cars and trucks.

University collaboration

Research contracts	Summer practice
Teaching Program	Diploma Projects
Conti InfoCenter	Private scholarship
ContiLab	Master Program
Sponsorship	PhD Projects
Recruiting fairs	Company visits, workshops, competitions

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Miele Tehnica Braşov is a subsidiary of Miele & Cie. KG, Germany. It was established in 2009 as a second electronics factory in the group, after the plant in Gütersloh.

The Miele plant in Braşov currently has 200 employees and produces electronic components for a wide range of Miele appliances, such as washing machines, tumble dryers, vacuum cleaners, ovens and others. The products Miele offers to its customers set the standards for durability, performance, ease of use, energy efficiency, design and service products.

In august 2015, in Braşov, a software development division was created. Within this new division the software for a wide variety of Miele appliances is developed.

The facility in Braşov is equipped with state-of-the-art technology and all quality requirements are respected according to the Miele Group's standards. This fact is acknowledged by all the certifications currently in place: ISO 9001, ISO 14001, ISO 50001, OHSAS 18001 and SA 8000.

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Corporate Fact Sheet

Overview

Microchip Technology Inc. is a leading provider of microcontroller, mixed-signal, analog and
Flash-IP solutions, providing low-risk product development, lower total system cost and faster
time to market for thousands of diverse customer applications worldwide. Headquartered in
Chandler, Arizona, Microchip offers outstanding technical support along with dependable delivery and quality. For more information, visit the Microchip website at http://www.microchip.com.

- Founded in 1989
- Publicly held (NASDAQ: MCHP) and listed on the Standard & Poor's 500 financial index
- $2.161 billion in net sales for fiscal year 2015 (ending March 31, 2015)
- More than 9,400 employees worldwide
- 50 sales offices worldwide
- Manufacturing facilities: Tempe, AZ; Gresham, OR; Bangkok, Thailand
- Development centers: Bangalore, India; Lausanne, Switzerland; Santa Clara & Los Angeles,

CA; Chandler, AZ; Bucharest, Romania; Manila, Philippines; Budapest, Hungary; Brisbane,
Australia; Milwaukee, WI; Norristown, PA; Shanghai, China; Hsinchu, Taiwan; Austin, TX;
Karlsruhe, Germany; Gothenburg, Sweden; Hauppauge, NY; Chennai, India; Irvine, CA;
Hong Kong, China; Vietnam

- The Company's quality systems are ISO/TS-16949:2009 certified
- 98 consecutive quarters and 24 consecutive years of profitability, as of March 2015
- Has shipped more than 15 billion PIC® microcontrollers
- #1 in worldwide 8-bit microcontroller revenue
- Corporate headquarters: 2355 W. Chandler Blvd., Chandler, AZ 85224, United States

Applications

Microchip serves over 90,000 customers in more than 65 countries who are designing highvolume embedded control applications in the consumer, automotive, office-automation, communications and industrial-control markets worldwide.

An invitation to TIE 2017

It is our distinct pleasure to invite you to the 26-th edition of TIE that will be hosted by the Faculty of Electronics, Telecommunications and Information Technology of the Gheorghe Asachi Technical University of Iasi on 20-22 April 2017.

Situated in the East of Romania, Iasi is the main economic, cultural and business center of the Moldavian region of Romania, one of the most important education and research centers of the country and a symbol in Romanian history. The Gheorghe Asachi Technical University of Iasi was founded in 1937. Now it has 11 faculties, covering 27 fields and 56 specializations of study with more than 16000 students, and about 950 academic staff.

Specialized education in the field of Electronics started in Iaşi in 1911, with the setting up of the School of Electricity at Alexandru Ioan Cuza University. After the establishment of the Polytechnic Institute of Iaşi in 1937, Electronics was taught as part of Radio-techniques, Techniques of Weak Currents and Industrial Electronics. In 1971, the Department of Applied Electronics was included in the Faculty of Electrical Engineering, and in 1975 it became the Department of Electronics and Telecommunications. Since 1990 it is one of the eleven faculties of Gheorghe Asachi Technical University of Iaşi.

Coming back to TIE 2017, accommodation of participants will be in Tudor Vladimirescu campus which has modern facilities and recreational reading for students. The contest will be held in Library Technical University of Iasi which, according to a survey conducted by the portal boredpanda.com, has been declared the most beautiful library in the world. The awarding ceremony will take place in the Aula of the Technical University Gheorghe Asachi of Iasi where you can admire paintings representing King Carol I and Queen Elizabeth, who played a major role in raising the Palace University from Copou. Last but not least you will visit the impressive Hall of Lost Steps with Sabin Balasa's paintings.

We are looking forward to welcoming you in Iasi at TIE 2017.

Iasi, March 29, 2016

Assoc. Prof. Tecla Goraş, Ph. D.
Gheorghe Asachi University of Iasi
Vice-Dean of Faculty of Electronics,
Telecommunications and Information Technology
TIE 2017 Event Director

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