



ELECTRONICA SISTEMELOR INTELIGENTE





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Nr crt	Disciplina	C	S	L	P	Cr./Ex
Anul I Sem. 1						
1	Disciplină opțională 1	2	0	2	0	5/E
2	Disciplină opțională 2	2	0	2	0	5/E
3	Convertoare nepoluante	2	0	1	0	5/E
4	Rețele neuronale profunde	2	0	1	0	5/E
5	Etică și integritate academică	1	0,5	0	0	2/D
6	Practica de cercetare 1	147 ore				8/D
	Total	9	0,5	6	0	10,5

Disciplinele opționale 1, 2 - două din șase

1. Modele de date avansate
2. Semnale și sisteme numerice de comunicații
3. Procesoare și sisteme de achiziție
4. Tehnici moderne de programare
5. Modelare statistică și stocastică
6. Metodologia proiectării și cercetării

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Nr crt	Disciplina	C	S	L	P	Cr./Ex
Anul I Sem. 2						
1	Disciplină opțională 3	2	0	1	0	5/E
2	Optimizarea parametrilor convertoarelor de energie	2	0	1	1	5/E
3	Conducerea inteligentă a mișcării	1	0	2	0	6/E
4	Procesoare de putere de înaltă frecvență	2	0	1	1	6/E
5	Practica de cercetare 2	168 ore				8/D
	Total	7	0	5	2	12

Disciplina opțională 3 - una din trei

1. Sisteme cu învățare automată
2. Vedere artificială
3. Prelucrarea imaginilor

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Nr crt	Disciplina	C	S	L	P	Cr./Ex
Anul II Sem. 3						
1	Disciplină opțională 4	2	0	1	0	5/E
2	Sisteme cu consum redus	2	0	0	2	6/E
3	Neliniaritate, bifurcație și haos în electronică	1	0	0	2	5/E
4	Elemente de inteligență artificială	2	0	1	1	6/E
5	Practica de cercetare 3	168 ore				8/D
	Total	7	0	2	5	30

Disciplina opțională 4 - una din trei

1. Testarea automată a sistemelor inteligente
2. Robotică pentru asistență medicală
3. Sisteme în timp real

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Nr crt	Disciplina	C	S	L	P	Cr./Ex
Anul II Sem. 4						
1	Practica pentru elaborarea lucrării de disertație					182 ore 7 săptămâni 10/D
2	Elaborarea lucrării de disertație					182 ore 7 săptămâni 10/D
3	Examen de disertație					10/E
	Total					30

VIPs for Automotive SOCs

- ✓ Ethernet AVB
- ✓ CAN, LIN, FlexRay,
- ✓ SATA, LPDDR4/3, DDR3, HDMI, MIPI-DPHY, PCIe, SPI, I2C

The Cloud:
Data services,
reporting
and tracking



Secure Cloud
Access
Gateway



Body / Comfort
Systems

CAN



Chassis / Safety
Systems



Infotainment
Systems



Powertrain
Systems

CAN



Camera (ADAS)
Systems







ARTIFICIAL
INTELLIGENCE

Exemple de posturi la Apple

Software Engineer vs Hardware Engineer



Job Title	
Software engineer	Hardware engineer
Job Description	
Develop, design and test software or construct, maintain computer networks and programs	Research, develop and test hardware or computer equipment
Education	
Software Engineering or Computer Science Degree	Electrical & Computer Engineering Degree
Skill Sets	
Technology Design, Complex Problem Solving, Critical Thinking, etc.	Troubleshooting, Problem Solving, Systems Evaluation, etc.
Salary	
\$107,840	\$112,760

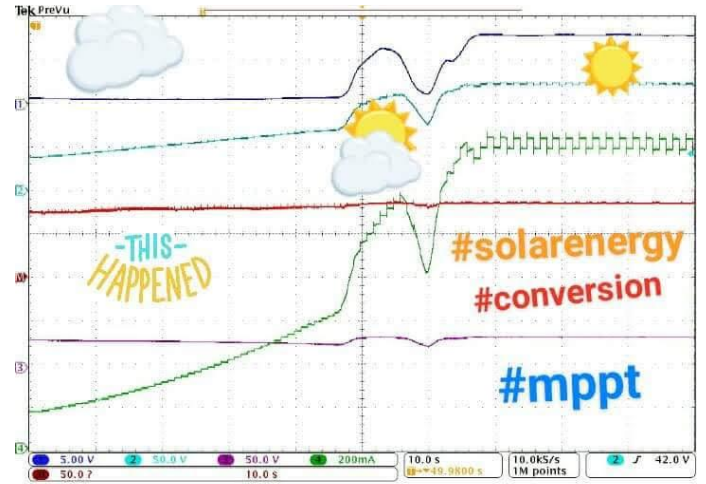
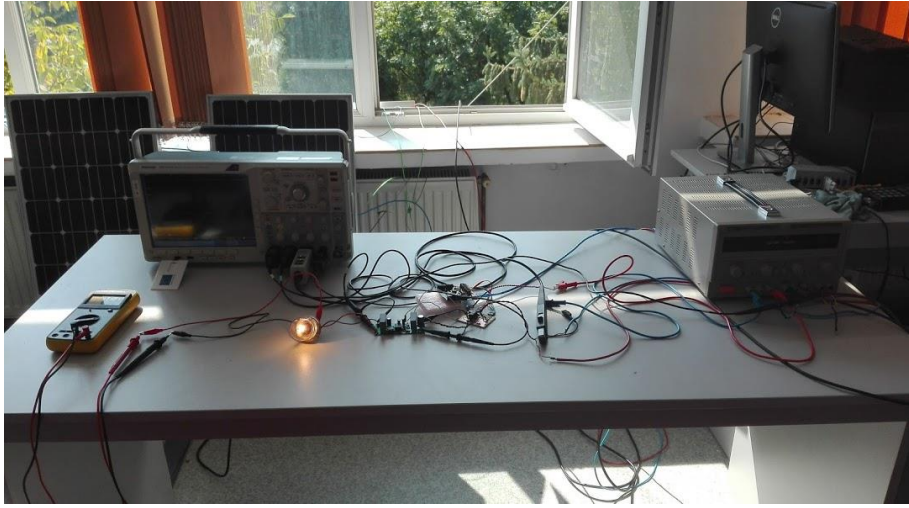


Sursa:

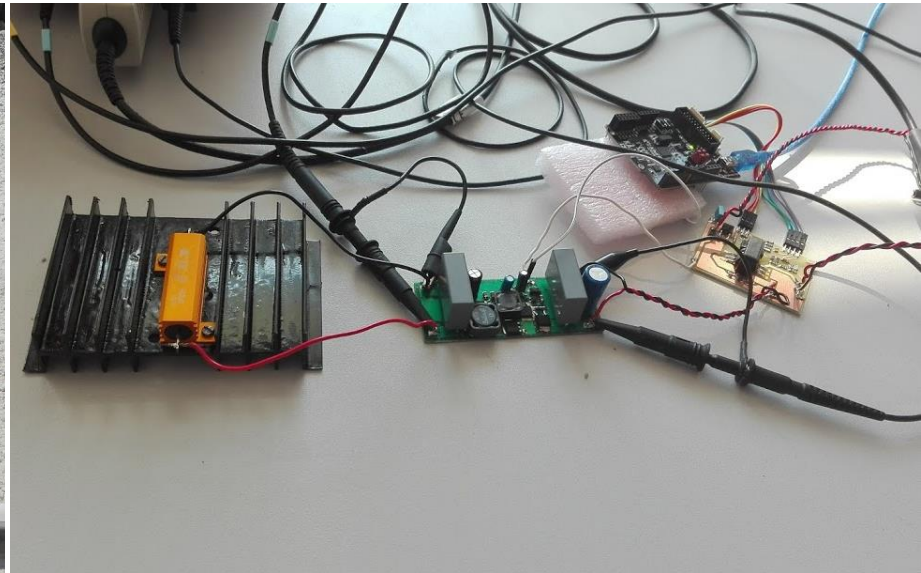
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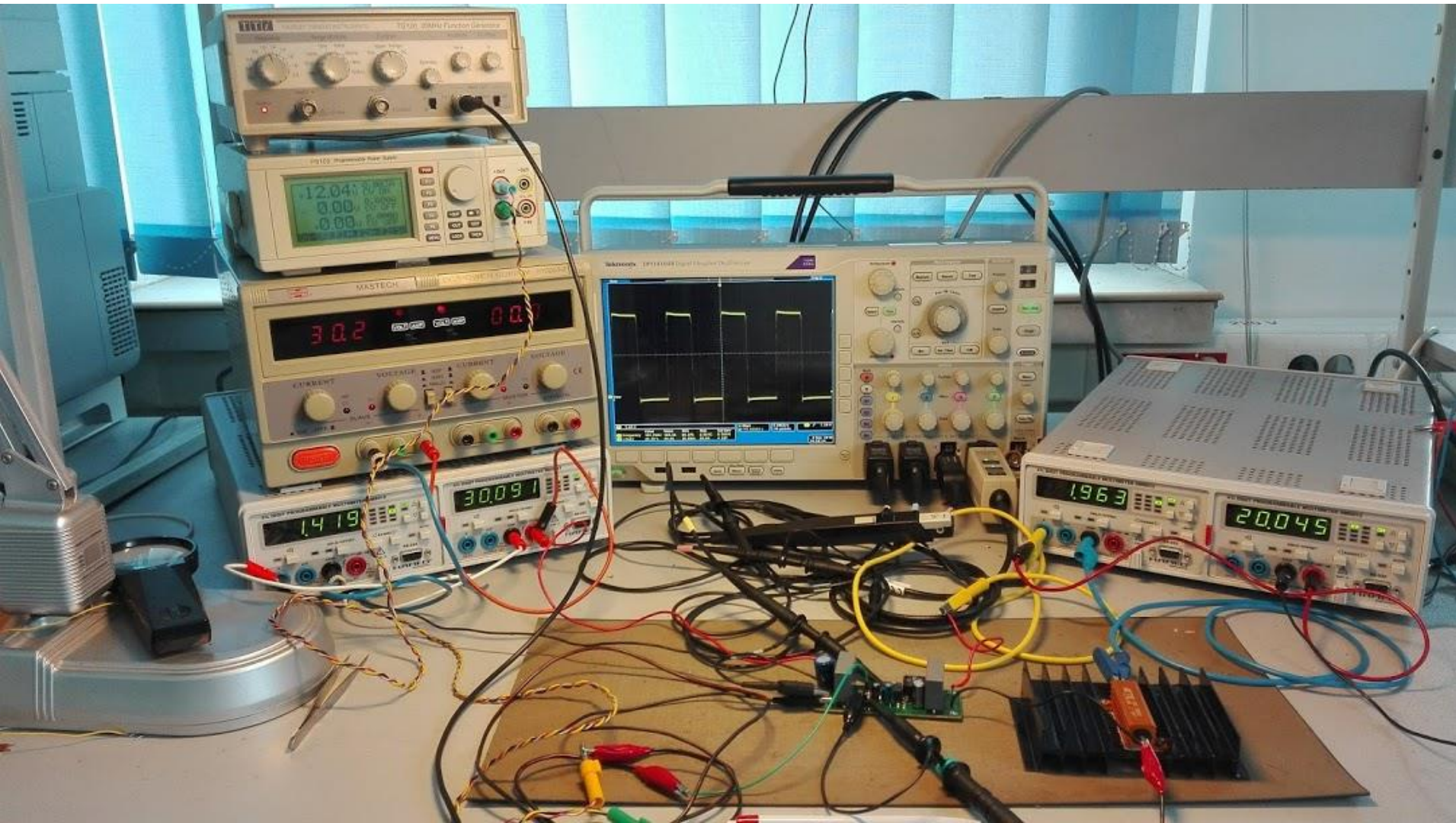
TESTAREA AUTOMATĂ A SISTEMELOR INTELIGENTE





16 Jul 2018
13:38:49





International Contests

Concursul Hard & Soft Novi-Sad 2019 locul I



International Contests

H&S Suceava 2022 = locul 2



International Contests



Universitatea
Ștefan cel Mare
Suceava

Faculty of Electrical Engineering and Computer Science

The 27th
International
Computers
Contest for
Students

**HARD
& SOFT**
Suceava
May 22-29, 2022

2nd PRIZE

awarded to

TIMISOARA, ETC

from: Politehnica University of Timisoara,
whose members were: Elisei Ștefan ILIEȘ, Bogdan Radu PREDA,
Vasile BOROICA, Paul Samuel SCHULDESZ,
Adviser: Septimiu MISCHIE, Coach: Radu RICMAN

A handwritten signature in black ink, appearing to read 'Nicolae Bogdan FOICA'.

President:

Nicolae Bogdan FOICA

ServiceXpert GmbH, Munich

May 27th, 2022

International Contests

Hard & Soft Suceava 2023 - local I



International Contests

Hard & Soft 2023 - locul I





Shunt Active Power Filter

Engineering and Computing, Zagreb, Croatia



Simulation model - BC/DC control



Simulation model - DC control



2019 International Conference on Electrical Drives & Power Electronics (EDPE)
The High Tatras, 24-26 Sept 2019

A NOVEL BOOST CONVERTER WITH TWO INDEPENDENTLY CONTROLLED SWITCHES

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ABSTRACT
This new topology features a static converter ratio that makes it suitable in applications requiring an output voltage consistently higher than the input voltage. Full operation at moderate duty cycles. Full operation design using the traditional approximations. The new topology is validated by computer simulation and finally by experimental results.

New Topology

The new boost converter of the CPST level. The new proposed boost converter.

DC Analysis

- dc internal capacitor voltage: $V_{C1} = \frac{V_o}{1-D}$
- dc output voltage: $V_o = \frac{V_i}{1-D}$
- the static conversion ratio: $M = \frac{V_o}{V_i} = \frac{1}{1-D}$
- dc inductor currents: $I_{L1} = \frac{P_o}{V_i(1-D)}$, $I_{L2} = \frac{P_o}{V_i(1-D)^2}$

Devices Stresses

- voltage stress and dc current through switch S₁
- voltage stress and dc current through switch S₂
- voltage stress and dc current through diode D₁
- voltage stress and dc current through diode D₂

Design Example

Specifications:

- Input voltage: $V_i = 15V$
- Output voltage: $V_o = 90V$
- Output power: $P_o = 15W$
- Switching frequency: $f_s = 85 \text{ kHz}$
- Min. $V_{in}/V_o = 0.167$
- $R = \sqrt{2} P_o = 5400$

Component Values

- Imposing $D_{0.5} = 0.405$ satisfies the second condition $D_{0.5} > 0.5 = D_{0.4} < 0.5$
- $L_1 = 3.3 \text{ mH}$, $L_2 = 2.68 \text{ mH}$, $C_1 = 1 \mu\text{F}$, $C_2 = 1.5 \mu\text{F}$

Device stresses

- $V_{S1} = V_{D1} = 90V$, $V_{S2} = V_{D2} = 75V$
- $I_{L1} = 0.66A$, $I_{L2} = 0.66A$, $I_{D1} = 1A$

Simulation Results

Experimental Results

Inductor Coupling for Smooth Input

- If the capacitor voltage ripples are neglected, the converter operates in three topological states $\Rightarrow V_{C1} = V_{C2}$
- This leads to the loss of coupling in the Cuk converter in order to obtain its input current. It is known:

$$V_{C1} = \frac{V_o}{1-D}$$

$$V_{C2} = \frac{V_o}{1-D}$$

If the coupling factor is chosen equal to 1, then $\frac{dV_{C1}}{dt} = 0 \Rightarrow I_{L1}$ is constant.

Conclusions

- compared to double cascade converter, the complexity is the same
- compared to the double cascade converter, the degree of freedom allows for conversion ratio.
- flexibility of the converter recommends it in high step-up applications.

Selected References

- [1] Chen G. Multilevel Active Power Converters Having Two Switches. IEEE 33rd Annual Power Electronics Specialists Conference, June 2001, Valencia.
- [2] D. Marinescu and S. Ciocan. High Voltage DC Conversion Using Two Switches. IEEE Trans. on Power Electronics, vol. 26, no. 10, pp. 151-157, 2011.
- [3] Marinescu D., Ciocan S. High Voltage DC Conversion Using Two Switches. IEEE Trans. on Power Electronics, vol. 26, no. 10, pp. 151-157, 2011.



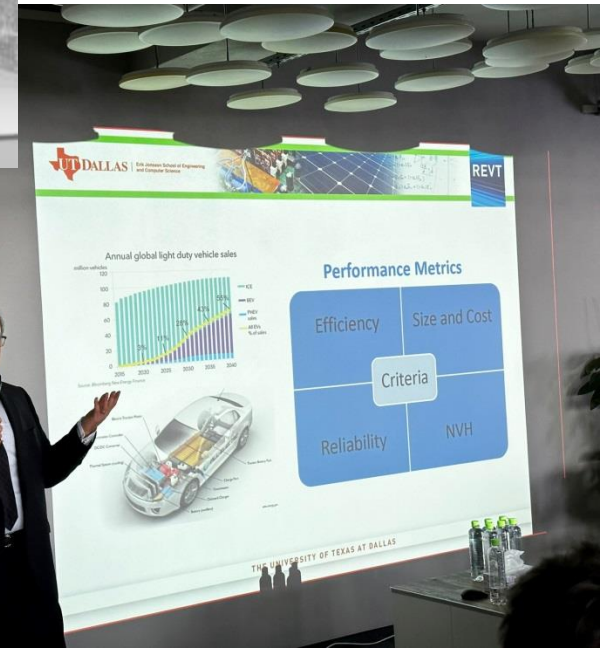
Trei ani consecutivi, premiul de „Excelență în cercetare” al UPT acordat tinerilor masteranzi a fost obținut de un masterand **Electronica Sistemelor Inteligente**

- 2020 - Delia Boțilă,
- 2021 - Elisei Ilieș - actualmente doctorand Infineon
- 2022 - Magdalena Marinca - actualmente doctorand Infineon



Oportunități

ZF - laborator de cercetare în electronică de putere în cadrul UPT - corp D



Oportunități

Vitesco Technologies - teme de disertație și doctorat din companie



Oportunități

Infineon Austria - teme de disertație în **“Power electronics”** și **“Artificial intelligence”**



IPCEI - Important Project of Common European Interest - Microelectronică



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IPCEI ON MICROELECTRONICS

Important Project of Common European Interest

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29 European companies are directly involved in the „IPCEI on Microelectronics. Here you can sort by name and technology field.

Energy efficient chips	Power semiconductors	Smart Sensors	Advanced optical equipment	Compound materials
CEA-Leti 	3-D Micromac* 	CEA-Leti 	AMTC* 	AZUR Space Solar Power 
Cologne Chip 	AP&S International 	<i>CorTec</i> 	Carl Zeiss 	CEA-Leti 
Globalfoundries 	AT&S 	Elmos Semiconductors 		Integrated Compound Semiconductors 
NXP Semi-conductors Austria 	CEA-Leti 	Fondazione Bruno Kessler 		IQE 
<i>RacyICs</i> 	Elmos Semiconductors 	Infineon 		Newport Wafer Fab 
Soitec 	Infineon 	Robert Bosch 		SPTS Technologies 
ST Micro-electronics  	Infineon Austria 	ST Micro-electronics  		OSRAM 
X-FAB 	MURATA 	TDK-Micronas 		SYNRED 
	Robert Bosch 	LYRED 		Soitec 
	SEMIKRON 	X-FAB  		ST Micro-electronics 
	ST Micro-electronics  			
	X-FAB 			

Name in *italics* = SME
*associated partner



Finanțat de
Uniunea Europeană
NextGenerationEU



Planul Național
de Redresare și Reziliență

Cele trei întreprinderi din România notificate sunt:

NXP Semiconductor România – 86.52 mil euro; **UPT-ETcTI partener indirect**
Robert Bosch SRL și Bosch Automotive SRL – 34,31 mil euro;
Continental Automotive – 74,8 mil. Euro. **UPT-ETcTI partener indirect**

Finanțarea UPT- peste 20 milioane Euro

DON'T

HESITATE

