



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 conf. dr. ing. Dan Negoïtescu	2	0	1	0	5/E
4	Rețele neuronale profunde prof. dr. ing. Cătălin Căleanu	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 - s.l. dr. ing. **Marian Bucos**
2. Semnale și sisteme numerice de comunicații - prof. dr. ing.
3. Procesoare și sisteme de achiziție - prof. dr. ing. **Daniel Belega**
4. Tehnici moderne de programare - prof. dr. ing. **Aurel Gontean**
5. Modelare statistică și stocastică - conf. dr. ing. **Romeo Negrea**
6. Metodologia proiectării și cercetării - prof. dr. ing. **Radu VasIU**

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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 conf. dr. ing. Dan Negoïtescu	2	0	1	1	5/E
3	Conducerea inteligentă a mișcării s.l. dr. ing. Petru Papazian	1	0	2	0	6/E
4	Procesoare de putere de înaltă frecvență prof. dr. ing. Dan Lascu	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 - conf. dr. ing. **Georgiana Simion**
2. Vedere artificială - prof. dr. ing. **Codruța Ancuți**
3. Prelucrarea imaginilor - sl.dr. ing. **Ciprian David**

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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 conf. dr. ing. Adrian Popovici	2	0	0	2	6/E
3	Neliniaritate, bifurcație și haos în electronică sl. dr. ing. Mircea Gurbină	1	0	0	2	5/E
4	Elemente de inteligență artificială - prof. dr. ing. Cătălin Căleanu	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 - conf. dr. ing. **Ioan Lie**
2. Robotică pentru asistență medicală - prof. dr. ing. **Ivan Bogdanov**
3. Sisteme în timp real - prof. dr. ing. **Ivan Bogdanov**

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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



LOCAL INTERCONNECT NETWORK

Chassis / Safety
Systems



ETHERNET



Infotainment
Systems



ETHERNET

Powertrain
Systems

CAN



ETHERNET

Camera (ADAS)
Systems



ETHERNET

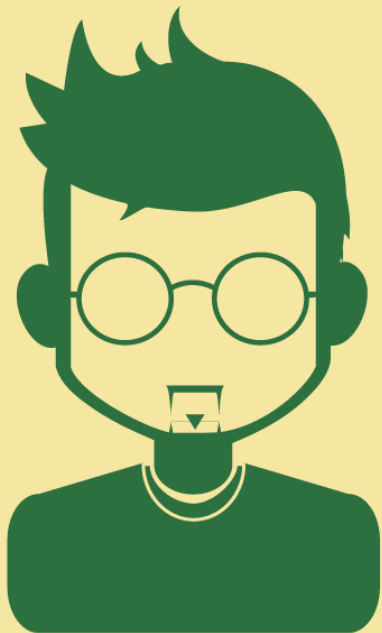




ARTIFICIAL
INTELLIGENCE

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

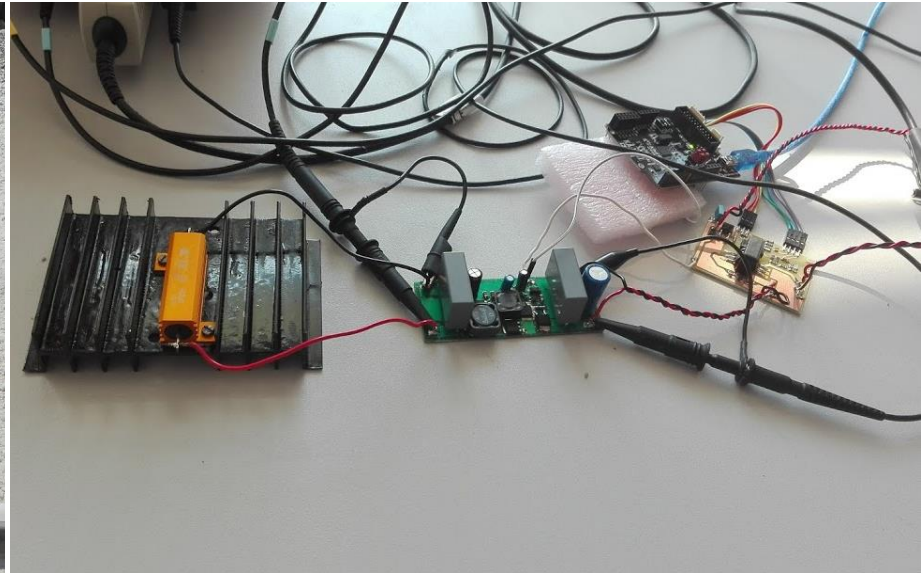
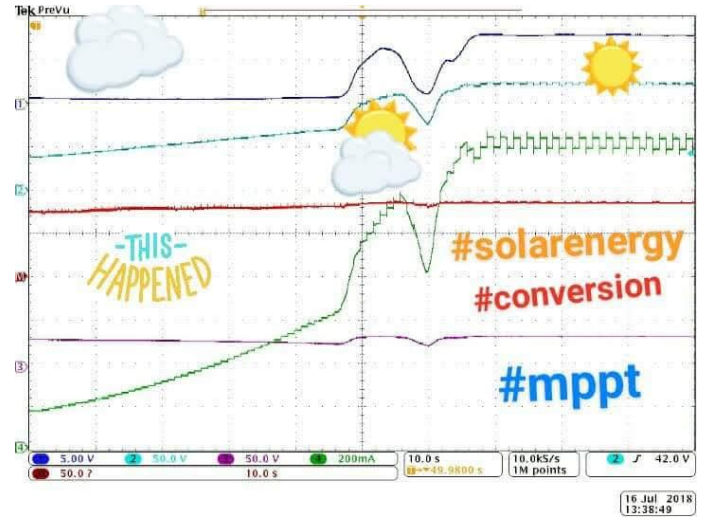


Sursa:

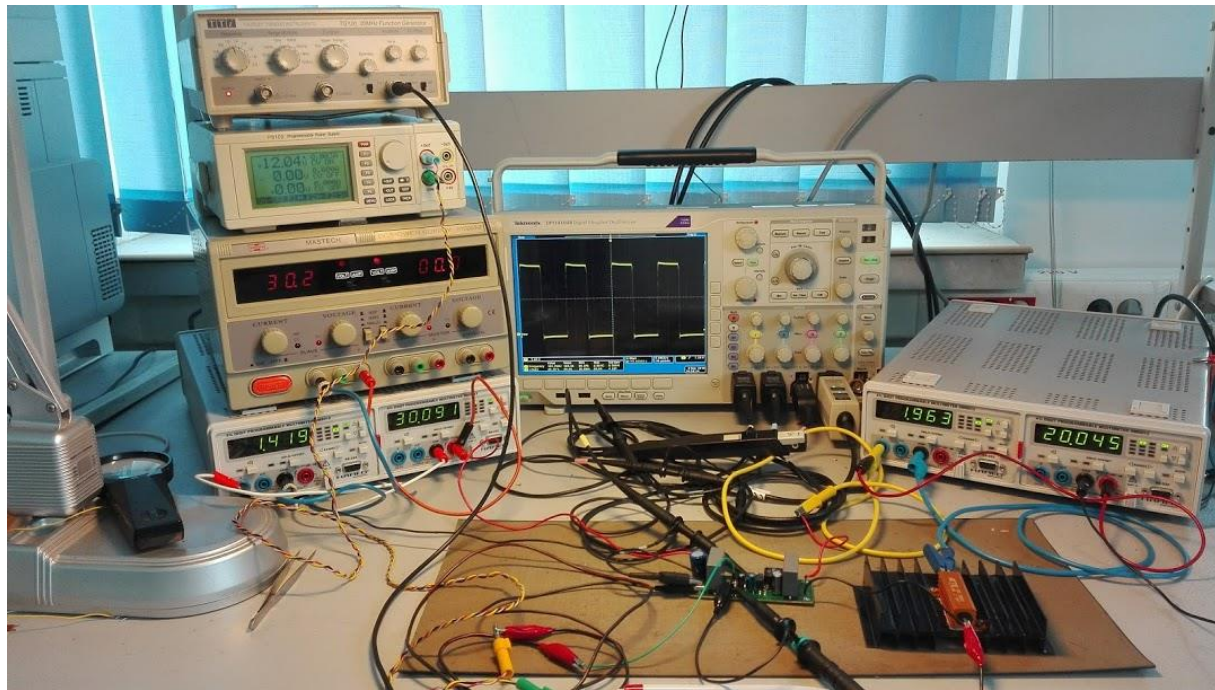
https://www.google.com/search?q=hardware+engineer+salary+vs+software+engineer+salary&tbm=isch&sa=X&ved=2ahUKEwjT767u4ML_AhXHZ_EDHeZjCnoQ0pQJegQICAB&biw=1280&bih=921&dpr=1

TESTAREA AUTOMATĂ A SISTEMELOR INTELIGENTE





Părți practice – experimente – testare



Concursul Hard & Soft 2019 locul I



H&S 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

Hard & Soft 2023 - locul 1



Hard & Soft 2023 - locul I





Shunt Active Power Filter

Engineering and Computing, Zagreb, Croatia

MARETON

Simulation model - DC/DC control:

Simulation model - DC/DC control:

Simulation Results

Simulation Results

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

Delta-Anca Botila¹, Ioana Monica Pop-Călimanu¹, Dan Lascu¹
¹ Applied Electronics Department, Politehnica University Timisoara
delta.botila@yahoo.com¹, ioana.m.pop@upt.ro¹, dan.lascu@upt.ro¹

Abstract:
The new topology features a static conversion ratio that remains 1 suitable in applications requiring an output voltage consistently higher than the input voltage. It also operates in continuous duty cycle. The converter is designed using the traditional approximation. The simulation results are validated by computer simulation and finally by experimental results.

Keywords: Boost Converter, New Topology

The new boost converter at the DPST level

The new proposed boost converter

DC Analysis

- dc internal capacitor voltage: $V_{C1} = \frac{D_1 V_g}{1-D_1}$, $V_{C2} = \frac{D_2 V_g}{1-D_2}$
- dc output voltage: $V_o = \frac{D_1 D_2 V_g}{(1-D_1)(1-D_2)}$
- the static conversion ratio: $M = \frac{V_o}{V_g} = \frac{D_1 D_2}{(1-D_1)(1-D_2)}$
- dc inductor currents: $I_{L1} = \frac{D_1 V_g}{R(1-D_1)}$, $I_{L2} = \frac{D_2 V_g}{R(1-D_2)}$

Devices Stresses

- voltage stress and dc current through switch S_1 : $V_{S1} = V_g$, $I_{S1} = I_{L1}$
- voltage stress and dc current through switch S_2 : $V_{S2} = V_g$, $I_{S2} = I_{L2}$
- voltage stress and dc current through diode D_1 : $V_{D1} = V_g$, $I_{D1} = I_{L1}$
- voltage stress and dc current through diode D_2 : $V_{D2} = V_g$, $I_{D2} = I_{L2}$

Design Example Specifications:

- Input voltage: $V_g = 15V$
- Output voltage: $V_o = 90V$
- Output power: $P_o = 150W$
- Switching frequency: $f_s = 85 kHz$
- Min. $V_{in}/V_g = 0$
- $R = V_o^2 / P_o = 540\Omega$

Component Values

- imposing $D_1 = 0.5$, $D_2 = 0.5$ satisfies the second condition $D_1 D_2 > 0.5 \Rightarrow D_1 = 0.4$
- $L_1 = 3.3 mH$, $L_2 = 2.68 mH$, $C_1 = 1 \mu F$, $C_2 = 1.5 \mu F$

Device stresses

- $V_{S1} = V_{S2} = 90V$, $V_{D1} = V_{D2} = 75V$
- $I_{L1} = 0.83A$, $I_{L2} = 0.66A$, $I_{S1} = 1A$

Simulation Results

Experimental Results

Inductor Coupling for Smooth Input

- if the capacitor voltage ripples are neglected, these topological states $\Rightarrow V_{C1}, V_{C2}$
- This leads to the idea of coupling the inductors in the Cuk converter in order to obtain a constant input current. It is known:
- $V_{C1} = \frac{D_1 V_g}{1-D_1}$, $V_{C2} = \frac{D_2 V_g}{1-D_2}$
- 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 a higher conversion ratio.
- flexibility of the converter recommends it in high step-up applications.

Selected References

- [1] Chen G, Hui S, et al. Power Electronics Handbook, 2nd Edition, Wiley, 2010.
- [2] D. Lascu, IEEE 33rd Annual Applied Power Electronics Conference, June 2001, Valencia, Spain.
- [3] D. Lascu, IEEE Transactions on Power Electronics, Vol. 17, No. 1, pp. 151-157, Jan 2002.
- [4] M. K. Mishra, IEEE Transactions on Power Electronics, Vol. 17, No. 1, pp. 151-157, Jan 2002.
- [5] M. K. Mishra, IEEE Transactions on Power Electronics, Vol. 17, No. 1, pp. 151-157, Jan 2002.



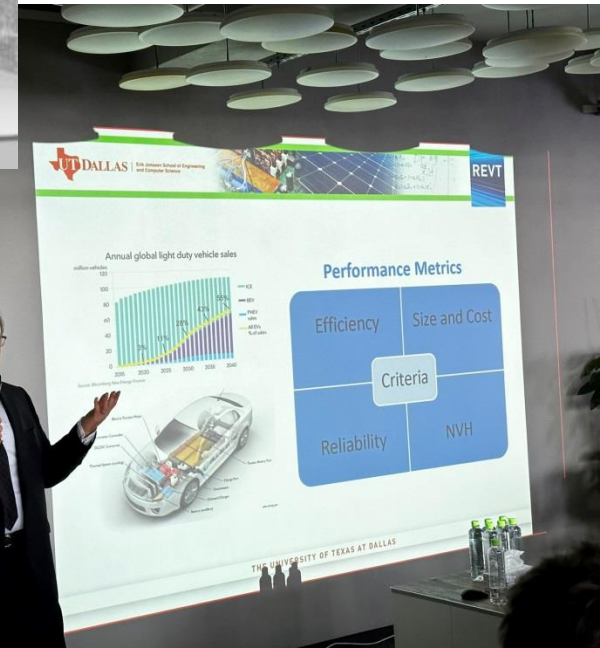
Pentru **al treilea** an consecutiv, premiul de „Excelență în cercetare” al UPT acordat tinerilor masteranzi a fost obținut de un masterand **Electronica Sistemelor Inteligente**

- 2020 - Delia Boțilă,
- 2021 - Elisei Ilieș
- 2022 - Magdalena Marinca



Oportunități

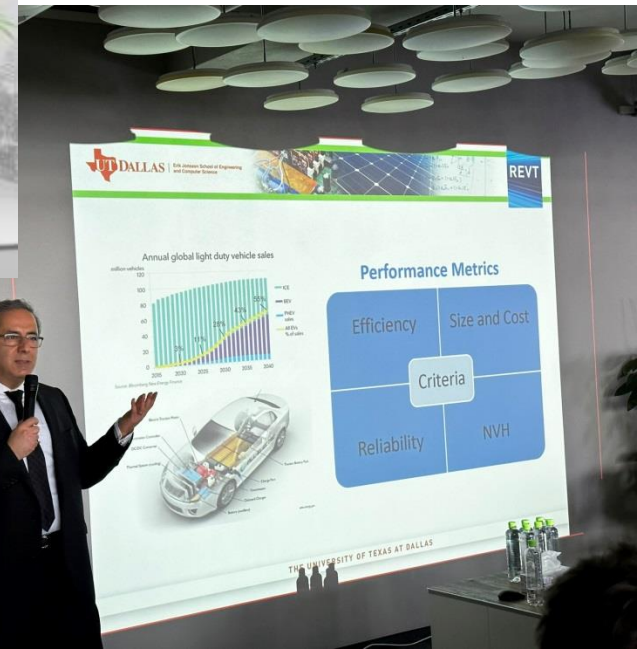
Laborator ZF - laborator de cercetare în electronică de putere în cadrul UPT - corp D



Oportunități

Vitesco Technologies - teme de disertație din companie

Infineon - teme de disertație



Oportunități

Vitesco Technologies - teme de disertație și doctorat din companie



Oportunități

Infineon Austria - teme de disertație în “power electronics” și “artificial intelligence”



DON'T

HESITATE

