

**CONTACT****INFORMATION**

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**SPECIALIZATION****COMPUTER & ELECTRICAL ENGINEERING**

- **Bio-/brain-inspired nano-architectures (i.e., highly reliable & ultra low-power)**
  - Advanced VLSI (low power, reliability enhanced gates/circuits, novel communication schemes)
  - Digital design (including threshold logic)
  - Circuit & VLSI complexity
  - Hardware implementations of neural networks (including constructive neural learning)
  - Biological/neural computations and communication (including massively parallel architectures)
  - Computer architectures and computer arithmetic

**BIO-SKETCH**

I graduated in 1980 from the Computer Science & Engineering Department of the University “Politehnica” of Bucharest (Romania) with a MSc thesis on high-speed graphic workstations (*Best MSc Thesis Award*). I researched, designed and developed ultra high-speed floating-point units (FPUs) and central processing units (CPUs) for two years while with the Research Institute for Computer Techniques, Bucharest (Romania). Returning to the University “Politehnica” of Bucharest, I became Assistant Professor (1983), and Senior Lecturer (1990), teaching, researching (computer architecture, VLSI design, digital circuits, artificial neural networks), and supervising (29 MSc theses).

In 1991, being awarded both a *Fulbright Research Fellowship* (USA) and a *PhD Scholarship* (Belgium), I went for the doctoral studies, and have been on leave of absence from the University “Politehnica” of Bucharest (till 2001).

- 11/1991 – 11/1994 • PhD candidate with the Electrical Engineering Department, Katholieke Universiteit Leuven (Belgium), where in May 1994 I earned my *PhD summa cum laude (highest honors)* for a thesis on area- and time-efficient VLSI implementations of artificial neural networks using threshold logic gates.
- 12/1994 – 09/1996 • *Human Capital and Mobility Individual Research Fellow* of the European Union with the Centre for Neural Networks, King’s College London (UK), conducting research on programmable neural arrays.
- 10/1996 – 08/1998 • *Director’s Postdoctoral Fellow* with the Space and Atmospheric Sciences Division, Los Alamos National Laboratory (USA), investigating adaptive/reconfigurable field programmable neural arrays for deployable adaptive processing systems.
- 09/1998 – 05/2001 • *CTO and co-founder* of RN2R LLC and *Fellow* of Rose Research (Dallas, USA), coordinating research on ultra-fast low-power VLSI enabling neural-inspired gates and circuits.

From June 2001 I became an Associate Professor with the School of Electrical Engineering & Computer Science, Washington State University, involved in teaching (VLSI/nanoelectronics, ASICs/FPGAs, neural computations, computer architecture), researching (low-power and highly reliable VLSI circuits, emerging biological-inspired nano-architectures), and supervising (1 PhD and 2 MSc). In March 2005 I was offered a visiting professor position with the School of Intelligent Systems, University of Ulster (Londonderry, UK), and in July 2005 I joined the College of Information Technology (CIT), United Arab Emirates University (UAUE, Al Ain, UAE) as *Chair of Computer Engineering* (2005–2006), where in 2006 I was promoted to *Associate Dean for Research & Graduate Studies* (2006–2011) while also supervising (1 Postdoc and 2 MSc). In Fall 2015 I joined “Aurel Vlaicu” University of Arad (UAV, Arad, Romania), and started to teach in two graduate programs as well as leading a 2M€ research grant (2016–2021).

I am/was PI or co-PI on 44 grants/contracts **totaling over 51 M\$** (as well as PI on over 100 short-term travel grants). The research results have been published/accepted: 2 books (3 more in slow progress), 8 book chapters (7 invited), 20 patents, 43 journal papers (3 invited), and 225 conference papers (28 invited and 8 best paper awards); presented over 400 times (out of which over 220 invited keynote/tutorials/presentations); and cited 1888 times (excluding self-citations).

I have been a reviewer for the National Science Foundation (USA), the European Commission (EU), as well as for the science foundations of Romania, Belgium, Cyprus, Switzerland, UAE, and for many journals and conferences. I was an *Associate Editor* of *IEEE Transactions on Neural Networks* (2005–2008), *IEEE Transactions on VLSI Systems* (2011–2015), *Nano Communication Networks* (2010–2015), and *Frontiers in Neuro Science* (2022–...). I have contributed to organizing 133 international conferences and 14 invited workshops/sessions, chaired 67 conference sessions, and I am a Senior Member of the IEEE since 1996 (in 1997 I was the Program Chairman of the IEEE Los Alamos Section), a founding member of the European Neural Network Society (ENNS), and a member of: the Association for Computing Machinery (ACM), the International Neural Network Society (INNS), and the EU Marie Curie Fellowship Association (MCFA). Additionally, I was a member of the SRC-NNI Working Group on Novel Nano-architectures (since 2003), the IEEE CS Task Force on Nano-architectures (since 2005), and the IEEE Emerging Technologies Group on Nanoscale Communications (since 2010).

ACCOMPLISHMENTS		<i>"We know what we are, but know not what we may be."</i>		<i>William Shakespeare</i>	
<b>TOP 2%</b>	• Stanford & Scopus	<b>Top 2% scientists</b>	10.1371/journal.pbio.3000918		2020–2022
<b>DIRECTOR</b>	• UAV	<b>NANOART, ThUNDER<sup>2</sup></b>	Arad	Romania	2016–...
<b>ASSOCIATE DEAN</b>	• UAEU	CIT	Al Ain	UAE	2006–2011
<b>CHAIR CE</b>	• UAEU	CIT	Al Ain	UAE	2005–2006
<b>FELLOWSHIPS</b>	• Rose Research	Fellow	Dallas, TX	USA	1999–2001
	• Director's PostDoc	Fellow	Los Alamos, NM	USA	1996–1998
	• Individual Research	HCM Fellow (EU)	London	UK	1994–1996
	• Doctoral Research	Fellow	Leuven	Belgium	1991–1994
	• Fulbright Research	Fellow	–	USA	1991
<b>PHD</b>	• Improved on the size/depth complexity for certain classes of Boolean functions				
<b>SUMA CUM LAUDE</b>	• Found novel VLSI-friendly constructive (learning) algorithms (analogous to EDA-like synthesis)				
<b>PUBLICATIONS</b>	• Books		2		(3 more in progress)
	• Chapters		8	7 invited	(5 more in progress)
	• Patents		20		
	• Journal papers (peer-reviewed)		43	3 invited	(6 more in progress)
	• Conference papers (peer-reviewed)		225	28 invited	& 8 Best Paper Awards
	• Citations (excluding self-citations)		1888		
<b>CONTRACTS OVER 51 M\$</b>	• Research grants/contracts		44		
	• Short-term travel grants		101		
<b>TEACHING</b>	• Advanced VLSI/Nanoelectronics, ASIC, Neural Computations, Neural Nets, Computer Architecture				
	• PostDoc (3), PhD (1), MSc (41)		45	10 UAV, 3 UAEU, 3 WSU, 29 UPB	
<b>RESEARCH RELATED ACTIVITIES</b>	• Referee for: National Science Foundation USA (28×), European Commission EU (6×), Belgium (2×), Cyprus (2×), Switzerland (2×), UAE (12×), and Romania (30×)				
	• Reviewer for: IEEE T. Nanotech., IEEE T. Neural Nets, IEEE T. Comp., IEEE T. Sys. Man & Cyber., IEEE T. CAD, IEEE T. Design & Test, IEEE T. VLSI, IEEE Access, ACM J. Emerg. Tech., Nanotech., Neural Nets., Neural Net. World, Neural Proc. Lett., Electr. Lett., etc.				
	• Associate Editor (2010 – 2016)			Nano Communication Networks (Elsevier)	
	• Associate Editor (2011 – 2015)			IEEE Transactions on VLSI Systems	
	• Associate Editor (2005 – 2008)			IEEE Transactions on Neural Networks	
	• Associate Editor (2020 – ...)			Applied Sciences (Springer)	
	• Associate Editor (2021 – ...)			Mathematics (MDPI)	
	• Associate Editor (2022 – ...)			Frontiers in Neuro Science (Frontiers)	

- Best Paper Awards 8
- Invited sessions/workshops 14
- Invited articles in journals 3
- Invited keynote/plenary 28
- Invited tutorials 19
- Invited lectures/seminars 52
- Invited presentations (others) 119 (out of which 46 to industry)
- Organized international conferences 133
- Chaired sessions at international conferences 67

#### MEMBERSHIP

- Institute of Electrical and Electronic Engineers IEEE (*Senior Member* since 1996), International Neural Network Society (INNS), European Neural Network Society (ENNS, founding member), Association for Computing Machinery (ACM), EU Marie Curie Fellowship Association (MCFA)

#### MISCELLANEOUS

- *Four Gold Medals* (First Prize) at the National Physics Olympics
- *Best MSc Thesis Award*
- Expert of the European Artificial Neural Network Activity (DEANNA)
- Expert of the Romanian Academy of Sciences

#### CURRENT RESEARCH

- My current research activities are focused on nano-architectures, my major aim being to strengthen cooperation on *bio-/brain-inspired nano-architectures*, promote education, and generate new funding opportunities. My hope is that, through direct collaboration (special sessions, visits, grants, etc.), the number of experts joining such efforts will grow. The ultimate goal is **to advance understanding of enabling architectures** which would match novel devices and associated communication schemes, performing research starting **from ultra-low power reliability-enhanced bio-/brain-inspired circuitry up to larger scale systems**.

**EDUCATION** *"Ability is of little account without opportunity."* *Napoleon Bonaparte*

#### POSTDOCTORAL

- 1996 – 1998 • LANL Director's Postdoctoral Fellow Los Alamos National Lab
- 1994 – 1996 • EU Human Capital and Mobility (HCM) Individual Research Fellow King's College London

#### PHD IN CE/EE SUMMA CUM LAUDE (HIGHEST HONORS) KATHOLIEKE UNIVERSITEIT LEUVEN

- 1994 MAY • Thesis *Neural Networks Using Threshold Gates – A Complexity Analysis of Their Area- and Time-Efficient VLSI Implementations*
- 1992 – Specialization Neural Networks **INST. UNIV. KURT BÖSCH** Certif.
- 1991 PhD exam Parallel & Advanced Architectures UPB 10/10
- 1990 PhD exam Novel VLSI Structures UPB 10/10
- PhD exam Systolic & Neural Architectures UPB 10/10
- PhD exam Mathematical Complements UPB 10/10
- 1989 MAY – PhD entrance exam *VLSI Efficient Implementations of Parallel Architectures* UPB 10/10

#### MSc IN CS/CE BEST THESIS AWARD UNIV. "POLITEHNICA" BUCHAREST

- 1980 JUNE • MSc Thesis *High-Speed Graphic Parallel Accelerators* GPA 4.00/4.00 10/10
- 1979 DECEMBER • BSc in CE GPA 3.90/4.00 9.76/10

#### BACCALAUREATE FIRST PLACE "TUDOR VIANU" COLLEGE OF IT

- The Diploma of Baccalaureate states that I am a *"programmer and software assistant analyst"*
- 1975 GRE EQUIV. • Final examination (Baccalaureate) GPA 3.84/4.00 9.60/10
  - 1975 • *Valedictorian* (i.e., highest GPA at graduation) GPA 3.70/4.00 9.26/10

## ALMA MATERS

- University “Politehnica” of Bucharest** – Founded in 1818, it is the largest technical university of Romania with about 25,000 students (upb.ro). The Computer Science & Engineering Department (CSE) was founded in 1969 (cs.pub.ro) by prof. Mircea Petrescu.
- Katholieke Universiteit Leuven** – Founded in 1425, is the oldest catholic university of Northern Europe, recognized for names like Erasmus, Mercator, and Vesalius (www.kuleuven.be), is *in the world’s top 100 universities* (**42** in THE, **76** in QS – 2023 World University Rankings), and is the largest university in Belgium with over 50,000 students. The EE Department of was founded in 1900 (www.esat.kuleuven.be).
- King’s College London** – Founded in 1829, is one of the larger and oldest of London (www.kcl.ac.uk), with about 27,000 students, and is *in the world’s top 100 universities* (**35** in THE, **37** in QS – 2023 World University Rankings). The Mathematics Department (www.kcl.ac.uk/mathematics) has received the highest rating in the Research Assessment Exercise, being a ‘center of excellence’. The *Centre for Neural Networks* was the coordinator of the *European Neural Networks Network of Excellence*.

## ADVISORS

- Prof. Mircea Petrescu** – Founder of the CSE Department, Vice-Provost, and Director of the Computer Center, State Secretary of the Government of Romania, as well as Visiting Professor at the University of California at Berkeley (USA) and at the University of Grenoble (France). He was Vice-President of the Romanian Academy of Technical Sciences and is an honorary member of the Romania Academy of Sciences. He has published more than 120 articles and 8 books. [ro.wikipedia.org/wiki/Mircea\\_Petrescu](http://ro.wikipedia.org/wiki/Mircea_Petrescu)
- Prof. Joos Vandewalle** – Has been Vice-Dean, Visiting Professor at the University of California at Berkeley (USA), Chairman of the EE Department, and holder of the Francqui Chair on Neural Networks at the University of Liege (Belgium). He was elected Fellow IEEE in 1992, and Fellow IEE in 1998, and was the Vice-President for Region 8 of the IEEE Society on Circuits & Systems, and the coordinator of the Center for Neural Networks (Belgium). He has published over 600 articles and 18 books. [www.esat.kuleuven.be/stadius/person.php?id=18](http://www.esat.kuleuven.be/stadius/person.php?id=18)
- Prof. John G. Taylor** – Has been Director of the Centre for Neural Networks and President of the International Neural Network Society. He has held positions at: Institute of Advanced Study, Princeton (USA); Institut des Hautes Etudes, Paris (France); Christ College, Cambridge (UK); Mathematics Institute, Oxford (UK); Physics Department, Southampton (UK); Queen Mary College, London (UK); Rutgers University, New Jersey (USA). He has published more than 400 articles and over 20 books. [en.wikipedia.org/wiki/John\\_G.\\_Taylor](http://en.wikipedia.org/wiki/John_G._Taylor)

POSITIONS HELD	DATES	INSTITUTION	ADDRESS
<b>PROFESSOR</b>	• <b>09/2015 –</b>	<b>“Aurel Vlaicu” University Faculty of Exact Sciences</b>	<b>2-4 Elena Dragoi Str. RO-310330 Arad, Romania</b>
Professor	08/2008 – 08/2015	UAE University	Maqam Campus, Bldg. E1
Associate Dean	08/2006 – 08/2011	College of IT	PO Box 15551, Al Ain, UAE
Chair CE	07/2005 – 08/2006		
Visiting Professor	03/2005 – 08/2011	University of Ulster	Londonderry, UK
	07/2003 & 08/2004	Heinz Nixdorf Institute	Paderborn, Germany
	07/2002 & 04/2008	Los Alamos National Lab. Theoretical Division	MS 319, Los Alamos NM 87545, USA
Associate Professor	06/2001 – 06/2005	Washington State Univ. School of EECS	Spokane 102, Pullman WA 99164, USA

Co-founder	• 05/1998 –	RN2R LLC	Merit Drv.12750, #1020
CTO/Fellow	09/1998 – 05/2001	Rose Research	Dallas, TX 75251, USA
Director's	10/1996 – 08/1998	Los Alamos National Lab.	MS D466, Los Alamos
PostDoc Fellow		Division NIS	NM 87545, USA
EU HCM	12/1994 – 09/1996	King's College London	Strand, London
Res. Fellow		Centre for Neural Networks	WC2R 2LS, UK
Res. Fellow	05/1994 – 11/1994	Katholieke Univ. Leuven	Kasteelpark Arenberg 10
PhD cand.	11/1991 – 05/1994	EE Dept., ESAT-ACCA	Leuven, B-3001 Belgium
Co-founder	• 04/1990 –	SPRING Software Consult SRL	Blvd. Magheru 20, Bucharest
President	04/1990 – 08/1991		RO-10721, Romania
Senior Lect.	01/1990 – 06/2001	Univ. "Politehnica" of	Spl. Independentei 313, Bucharest
Assist. Prof.	01/1983 – 12/1989	Bucharest, CSE Dept.	RO-10334, Romania
Senior Res.	09/1981 – 01/1983	Research Institute for	Cl. Floreasca 167/9, Bucharest
Res. Eng.	09/1980 – 08/1981	Computer Techniques	RO-14459, Romania

## TEACHING

*"I like to learn, but I don't like to be taught"*

*Winston Churchill*

**I have been teaching/lecturing since 1981.** Between 1981 and 1983 I have been teaching part time, while since 1983 I have been teaching full time in the Computer Science & Engineering (CSE) Department of the University "Politehnica" of Bucharest (UPB): Assistant Professor (1983–1990), and Senior Lecturer (1990–2001). Between 1984 and 1991 I supervised 29 MSc candidates. Between 2001 and 2005, I was with the School of Electrical Engineering & Computer Science (EECS), Washington State University (WSU), where I supervised 2 MSc and 1 PhD, and contributed to getting the ABET accreditation of the newly formed Computer Engineering program. In 2005 I joined the College of Information Technology (CIT), United Arab Emirates University (UAEU), as well as visiting professor with the University of Ulster (UU). At UAEU I contributed to the ABET accreditation of the CIT, which started offering MSc in Fall 2013. That is why, since joining UAEU (in 2005), my graduate supervision has been limited: invitations on 8 PhD evaluation committees, supervising 2 MSc, and advising 1 PostDoc. Since Fall 2015 I am involved with two graduate programs offered by the "Aurel Vlaicu" University of Arad (UAV) having advised 8 MSc and supervised 2 PostDocs. Additionally, I have given 19 invited tutorials and 52 invited lectures.

	<b>COURSES TAUGHT/DEVELOPED</b>	<b>SINCE</b>	<b>UPB</b>	<b>WSU</b>	<b>UAEU</b>	<b>UAV</b>
<b>UNDERGRADUATE</b>	– Hardware Testing & Fault Tolerance	2013			UAEU	
	– Professional Responsibility in IT	2012			UAEU	
	– Advanced Computer Architecture	2006			UAEU	
	– ASIC & Digital Systems/VLSI Design	2001		WSU	UAEU	
	– Introduction to Algorithms/Programming	1984	UPB			UAV
	– Digital Computer Architecture	1983	UPB		UAEU	UAV
	– Analysis & Synthesis of Digital Circuits	1981	UPB		UAEU	
<b>GRADUATE</b>	– Neuro-Bio Fundamentals	2015				UAV
	– Research Methods in IT	2011			UAEU	UAV
	– Advanced VLSI/Nanoelectronics	2004		WSU		
	– Neural Computations	2003		WSU		UAV
	– Neural Networks & Applications	1990	UPB	WSU		UAV
	– VLSI/Intelligent Circuit Design	1983	UPB	WSU		UAV
	– Advanced Computer Architecture	1983	UPB			
– Testing & Performance Evaluation	1982	UPB				

**STUDENTS EVALS.** • Constantly higher (avg. **4.65/5.00**) than college (CIT 4.48/5.00) and university (UAEU 4.41/5.00)

## GRADUATE SUPERVISING

UAV (10), UAEU (3), WSU (3), UPB (29)

2024	45	– Designing Neural Networks Using Memristors (pending)	Valentin Puiu	MSc	
2022	44	– Optimal Models for Emotion Recognition	Vladlena Parolea	MSc	
2020	43	– Early Stage Investigations Using IBM Quantum Experience	Daniel-Tiberiu Patcaș	MSc	
	42	– The Importance of Recommender Systems	Roland-Norbert Kirch	MSc	
2018	41	– Testing the Reliability of Repetitive Quantum Circuits	Florin-Daniel Morar	MSc	
	40	– Using Deep Learning for Data Analysis	Ionel Mazilu	MSc	
	39	– On the Reliability of Critical Networks	Dan-Cristian Pascu	MSc	
	38	– 3D Fibonacci Spirals	Beniamin-Otniel Voian	MSc	
2017	37	– <b>Optimizing Two-terminal Networks Using Compositions</b>	Vlad Dragoi	<b>PostDoc</b>	
	36	– <b>Hammock Networks and Generalizations</b>	Simon R. Cowell	<b>PostDoc</b>	
2013	35	– Monte Carlo Analyses of XOR-2 in 22/16nm PTM (BITS Pilani)	Nilay V. Acharya	MSc	
	34	– Monte Carlo Analyses of MAJ-3 in 22/16nm PTM (BITS Pilani)	Jithu Lissi Raju	MSc	
2012	33	– <b>Brain-inspired Interconnects for Nanoelectronics</b>	Pietro Santagati	<b>PostDoc</b>	
2004	32	– <b>Design &amp; Analysis of SET: Neural-Inspired Gates &amp; Circuits</b>	Mawahib H. Sulieman	<b>PhD</b>	
	31	– Optimizing the Performance of Direct Digital Frequency Synthesizers for Low-Power Wireless Communication	David Betowski	MSc	
2003	30	– Precise Sine Approximations with Reduced Resources	Pao-Szu Wu	MSc	
1991	29	– Simulator for the Implied Minterm Structure	Simona Ivanov	MSc	
1990	28	– Set of C Functions for Simulating Parallel Processes	Dinu Creteanu	MSc	
	27	– Graphic Interface for a Neural Network Simulator	Dan Stoicescu	MSc	
	26	– Microbusiness Software Package	Anca Costin	MSc	
	25	– Neural Network Arithmetic Logic Unit	Yousuf Basmark	MSc	
	24	– VLSI Parallel Architecture for Histogram Modification	Aida Gheorghiu	MSc	
	23	– Boltzmann Machine Simulator	Mihaela Dumbrava	MSc	
	22	– Neural Network Solutions to Optimization Problems	Orest Robciuc	MSc	
	21	– Motion Detection Using Neural Networks	Anca Sigala	MSc	
	20	– Enhanced VLSI CAD Package	Daniel Mandu	MSc	
	1989	19	– Recognition of Characters Using Neural Networks	Abdel Nehad	MSc
		18	– Neural Network Medical Expert System	Sima Gheorghita	MSc
		17	– VLSI Animated Lesson for PC	Șerban Benone	MSc
	1988	16	– Neural Network Simulator	Sobhui Darwish	MSc
1987	15	– VLSI CAD Tool: Place & Route	Anca Șerban	MSc	
	14	– VLSI CAD Tool: Interactive Layout	Mariana Mirea	MSc	
1986	13	– Computer Interface for a Rotating Magnetic Head Unit	Sorinel Ciobanu	MSc	
	12	– CAD Tool for Digital Image Segmentation	Cornelia Cioținga	MSc	
	11	– CAD Tool for Digital Image Enhancement	Mihai Dinu	MSc	
1985	10	– Systolic Floating Point Coprocessor: Multiplication & Division	Eugen Pașol	MSc	
	9	– Systolic Floating Point Coprocessor: Addition & Subtraction	Liviu Zuzu	MSc	
	8	– VLSI Ultra High-Speed Arithmetic Units	Marius Ionescu	MSc	
	7	– Dedicated Serial Data Multiplier	Daniel Manica	MSc	
	6	– Systolic Circuits for Convolution	Anca Tanga	MSc	
	5	– A Study of Permutation Networks for VLSI Implementation	Sorin Tene	MSc	
1984	4	– VLSI Rule Checking Expert System	Manuela Anton	MSc	
	3	– High Speed Arithmetic Units	Bianca Tudor	MSc	
	2	– Self-Testable RAM/CAM Memory	Cristina Borș	MSc	
	1	– Self-Testable & Self-Repairable Correlation Circuit	Irina Manole	MSc	



## PLANS FOR COURSE DEVELOPMENT

- ADVANCED VLSI/  
NANO-ELECTRONICS**
- Novel nano-devices, new design styles, reliability enhancements, and reconfigurable computing
  - Examples [http://bwrcs.eecs.berkeley.edu/Classes/icdesign/ee241\\_s13/](http://bwrcs.eecs.berkeley.edu/Classes/icdesign/ee241_s13/)  
<http://www.cisl.columbia.edu/courses/spring-2002/ee6930/reader.html>  
<http://www.ece.unm.edu/~jimp/vlsill/index.html>
- ELECTRONIC  
NANO-TECHNOLOGY**
- This course could precede **ADVANCED VLSI/NANO-ELECTRONICS**
  - Examples <https://nanohub.org/courses/>  
<http://www-2.cs.cmu.edu/afs/cs/academic/class/15849c-s02/www/schedule.htm>  
<https://web1.eng.famu.fsu.edu/~mpf/PhysLim/>
- QUANTUM  
COMPUTING**
- Could be based on 14 seminars I gave at UAV (during 2019-2020)
  - Examples <https://learn-xpro.mit.edu/quantum-computing>  
[http://www.quiprocone.org/Protected/DD\\_lectures.htm](http://www.quiprocone.org/Protected/DD_lectures.htm)  
<https://ocw.mit.edu/courses/mathematics/18-435j-quantum-computation-fall-2003/>
- DIGITAL  
COMPUTER  
ARITHMETIC**
- Classic course bridging algorithms and hardware; I plan to use the books of Ercegovic & Lang [http://www.cs.ucla.edu/digital\\_arithmetic/](http://www.cs.ucla.edu/digital_arithmetic/) and Koren <http://www.ecs.umass.edu/ece/koren/arith/>
  - Examples <http://web.cs.ucla.edu/~milos/CSM51A-F19-Syllabus.pdf>  
<http://web.cs.ucla.edu/~milos/CS252A-W20-Syllabus.pdf>  
<https://www.epfl.ch/labs/lap/courses/> ["Computer Arithmetic" not active anymore]  
<https://scholar.google.com/citations?user=1A4y8RcAAAAJ>
- BIO-/BRAIN-  
INSPIRED  
COMPUTATIONS &  
COMMUNICATIONS**
- This course will go on to cover the digital-to-analog divide as well as parallel-and-neural computing architectures, learning and the power-reliability-communication design tradeoffs
  - Examples <http://www.ece.jhu.edu/~andreou/761/> & <http://www.ece.jhu.edu/~andreou/762/>  
<http://seunglab.org/courses/>

## RESEARCH

*"Never lose a holy curiosity."*

*Albert Einstein*

- EXPERIENCE**
- I was involved in research for well over 40 years, holding management positions for over 25 years, and executive positions for more than 15 years.***
- EXPERTISE**
- My expertise encompasses a range of areas starting from circuit/VLSI complexity, going through information theory, optimization techniques, and neural computations, to advanced VLSI/nanoelectronics and adaptive/reconfigurable circuits and systems.
- INTERESTS**
- I like to take abstract concepts for difficult but practical applications, turn them into efficient algorithms, and then design innovative VLSI circuits performing them optimally (e.g., at ultra-high speeds, with very low power/energy, highly reliable, etc.). I am extremely interested by emerging nanoelectronics and in particular by bio-/brain-inspired nano-architectures (massively parallel, adaptive/reconfigurable, fault-tolerant, using alternate communication schemes), and by their optimized designs inspired by arrays (e.g., biological/ion-channels, cellular, systolic).
- SIGNIFICANT  
RESEARCH  
RESULTS  
(FIRST EVER)**
- Advancing the understanding of reliable computations and communications*** 2017 –
  - Generalizations of hammock nets to 3D (akin to axonal transport networks)*** 2017 –
  - Energetics of neural communication (over  $10^3 \times$  lower energy than CMOS)*** 2015 –
  - Reliability of hammock nets (over  $10^{10} \times$  better than von Neumann multiplexing)*** 2015 –
  - Reported the best lower and upper bounds for consecutive- $k$ -out-of- $n$  systems 2014
  - Designed ultra low-power hybrid NEMS-CMOS circuits 2014
  - Analyzed Schmitt trigger gates/circuits (performances vs. applications) 2013
  - Detailed & accurate Monte Carlo simulations using Predictive Technology Models 2013
  - Highly reliable and low power CMOS circuits based on novel enabling sizing of transistors 2012

- Low-power and highly reliable bio-inspired arrays for communication and computation 2010
- Axon-inspired redundancy scheme ( $10^3 \times$  better than von Neumann multiplexing) 2009
- Bayesian EDA tool for very accurate reliability estimates (devices, input vectors, wires) 2009
- Introduced & evaluated NOR-2 von Neumann multiplexing 2010
- Estimated wires' reliability due to intrinsic noises (shot, thermal) 2009
- Used Rent rule to explain Brain's columnar structures (optimal hierarchical networks) 2007
- Devices & input vectors are more important than gates (when evaluating reliability) 2007
- Showed that serial connected architectures are optimal for nanoelectronics 2005
- Designed and simulated single electron transistor gates & circuits considering variations 2005
- Designed & simulated the largest single electron transistor circuit 2004
- Exact calculations of the reliability of von Neumann multiplexing (gate-level) 2004
- Proposed novel highly reliable and low-power locally connected architectures 2004
- Highly accurate piecewise linear, non-linear, and hybrid ROM-less DDFS 2003
- Noise-robust low power (self-timed, charge recycling, sub-threshold) perceptrons 2000
- Designed ultra-high performance adders using Fibonacci-weighted threshold gates 1999
- Showed that deeper & sparser artificial neural nets are VLSI-optimal 1997
- The best/tightest circuit complexity bounds for feed-forward neural computations 1994
- Proposed a continuous version of the Boltzmann machine 1992
- Self-testable and self-repairable units are a must for VLSI 1984

## HISTORY

- 1979 – 1989
- My research has been centered on *digital VLSI*, and in particular on: high-speed processing units (ALUs), smart memories (e.g., content addressable, set processing, hierarchical, self-testable), regular arrays (e.g., systolic, cellular). On these topics I have published about 20 papers. Since 1985 I have started looking into neural networks. This shift of interest was clearly marked by the paper "From Systolic Arrays to Neural Networks," *Scientific Annals of Al. I. Cuza Univ.*, 35(4):375–385, 1989 (J<sub>3</sub>).
- 1985 – 1992
- I have been 'learning' about *neural networks*, publishing about their capabilities (for image enhancement and recognition), and delved into Boltzmann machines introducing the new concept of a *continuous Boltzmann machine* (C<sub>28</sub>). On these topics I have published about 10 papers.
- 1992 – 2002
- I have been working on *hardware/VLSI implementations of threshold logic gates (perceptrons)*. On these topics I have published about 80 papers. This direction of research can be subdivided into:
    - *constructive learning* algorithms (equivalent to CAD/EDA synthesis, e.g., based on decomposition of functions, using the entropy of the data set, based on Kolmogorov's superpositions, etc.);
    - theoretical *circuit/VLSI complexity* issues;
    - hardware implementations (e.g., mapping onto FPGAs);
    - VLSI implementations (e.g., high-speed, low-power, reliability enhanced, noise immune).
- SINCE 2003**
- I have been focusing on *nano-architectures*. On this topic I have published almost 200 papers:
    - ultra low-power and reliability-enhanced (gates, circuits and systems);
    - from von Neumann multiplexing to novel array-based redundancy schemes (e.g., axon-inspired);
    - brain-inspired hierarchical optimal interconnect topologies/networks;
    - analyses of wires and alternate communication paradigms.

## RESULTS

- **Funded** 44 research grants/contracts, and 101 short-term travel grants 51 M\$
- Published 2 books, 8 chapters, 20 patents, 43 journals, 225 conferences
- Invited 28 keynotes, 19 tutorials, 52 lectures, 119 presentations (out of which 46 to industry)
- Cited 1888 times (excluding self-citations) – hand counted (available upon request)
- Organized 133 conferences, 67 sessions chaired



## RESEARCH PROJECTS/GRANTS (AWARDED, DIRECTED, ETC.)

Considering	<ul style="list-style-type: none"> <li>– EDA for NEMS and Reliability-Optimal CMOS-transistor Sizing (EDA-ROCS) Co-PI With W. Ibrahim (UAEU), and T.-J. King Liu (UC Berkeley)</li> <li>– Ultra Reliable Array-based Architectures for CMOS and Beyond (URA<sup>2</sup>) PI 1M€ With L. Anghel (INP Grenoble), NanoSciences Foundation</li> <li>– Novel Biologically-inspired Architectures for nano-Devices (NBAD) PI 3M€ With G. Fettweis (TU Dresden), EU ERC Advanced</li> </ul>	
<b>2021 – 2024</b> <b>THUNDER<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• <b>Techniques for Unconventional Nano-Designing in the Energy-Reliability Realm</b> PI 1.2MRON Started on 01/09/2021 (contract PCE238/07.04.2021) PN-III-P4-ID-PCE-2020-2495 V. Dragoi (UAV), S. Cowell (UAV), R. Beiu (UAV), L. Daus (UTCB), M. Jianu (UTCB), M. Tache (UPB)</li> </ul>	
2022	<ul style="list-style-type: none"> <li>• Short term travel grants (invited): ICCCC'22 (US\$ 500) 0.5K\$</li> </ul>	
2020	<ul style="list-style-type: none"> <li>• Short term travel grants (invited): ICCCC'20 (US\$ 500), SOFA'20 (US\$ 300) 0.8K\$</li> </ul>	
2019	<ul style="list-style-type: none"> <li>• Short term travel grants (invited): ECC'19 (US\$ 300) 0.3K\$</li> </ul>	
2018	<ul style="list-style-type: none"> <li>• Short term travel grants (invited): ICCCC'18 (US\$ 800), SOFA'18 (US\$ 600) 1.4K\$</li> </ul>	
2016 – 2021 BioCell-NanoART	<ul style="list-style-type: none"> <li>• Novel Bio-inspired Cellular Nano-architectures PI 9.3MRON With V.-F. Duma (UAV), F.-D. Munteanu (UAV), C. Stoica (UAV), POC-A1-A1.1.3-E nr. 30/2016 P. Gaspar (UAV), V.E. Balas (UAV), M. Balas (UAV), A. Cavaco-Paulo (U Minho), L. Daus (UTCB)</li> </ul>	
2016	<ul style="list-style-type: none"> <li>– Short term travel grants (invited): ICCCC'16 (US\$ 500), SOFA'16 (US\$ 500) 2K\$ IEEE-NANO'16 (US\$ 1,000)</li> </ul>	
2014 – 2016 ULP-DigiFinA	<ul style="list-style-type: none"> <li>– ATIC-SRC Center of Excellence in Energy Efficient Electronic Systems (ACE<sup>4</sup>S) Co-PI 35MAED Task: Ultra-low Power Digital Sub-threshold FinFET Amplifiers SRC GRC ACE<sup>4</sup>S Originally with G. Fettweis (TU Dresden) and M. Alioto (Natl. U Singapore) <a href="https://www.src.org/newsroom/press-release/2013/452/">https://www.src.org/newsroom/press-release/2013/452/</a></li> </ul>	
2013 – 2016 SECRET	<ul style="list-style-type: none"> <li>– Strengthening Research Collaborations in High-impact and Emerging Co-PI 1.23M€ Technologies between GCC and EU EU EM 545790-EM-1-2013-1-UK-ERA MUNDUS-EMA22 With B. Aziz M. Rahman PI (City U London), G. Cuniberti (TU Dresden), V. Hessel (TU Eindhoven), O. Benitez (U Deusto), P. Candeloro (U Magna Graecia), C. Themistos (Frederick U), H. Bourdoucen (Sultan Qaboos U), F. Bou-Rabee (Kuwait U), S.A. Al-Mansoori (U Bahrain), F. Kharbash (UAEU)</li> </ul>	
2012 – 2015 SYMONE	<ul style="list-style-type: none"> <li>– Synaptic Molecular Networks for Bio-inspired Information Processing Co-PI 2.81M€ With G. Wendin PI (Chalmers U), D. Vuillaume (CNRS-IEMN), J. Roncali EU FP7-ICT-318597 (CNRS-MOLTECH), M. Calame (Basel U), S. Yitzchaik (HUJI), C. Gamrat (CEA), and G. Cuniberti (TU Dresden)</li> </ul>	
2012 – 2014 Use-LP	<ul style="list-style-type: none"> <li>– Unconventional Sizing for Enabling Low Power Digital Design PI 200K\$ With M. Alioto (U Siena/Natl. U Singapore), A. Beg (UAEU), SRC 2012-TJ-2332 W. Ibrahim (UAEU), and F. Kharbash (UAEU)</li> </ul>	
2011 – ULP-NBA	<ul style="list-style-type: none"> <li>• Ultra Low-Power Application-specific Non-Boolean Architectures [Intel Co] Co-PI 1M\$ With Intel PI, D. Hammerstrom (Portland State U), W. Porod (U Notre Dame), URO 2011-05-24G S.P. Levitan (U Pittsburgh), T. Shibata (U Tokyo), T. Roska (Hungarian Acad. Sci.), M. Pufall (NIST), D. Weistein (MIT), and M.R. Stan (U Virginia)</li> </ul>	
2011 – 2015 ULP-NEMS-CMOS	<ul style="list-style-type: none"> <li>– Ultra Low Power NEMS-CMOS PI 300K\$ With T.-J.K. Liu (UC Berkeley), W. Ibrahim (UAEU), and A. Beg (UAEU) SRC 2011-HJ-2184</li> </ul>	
2011 – 2013	<ul style="list-style-type: none"> <li>– Brain-inspired Interconnects for Nanoelectronics (BiIN) PI 586KAED With W. Ibrahim (UAEU) [UAE Natl. Res. Found.] NRF 1108-00451</li> </ul>	
2011 – 2013	<ul style="list-style-type: none"> <li>– Algorithms &amp; EDA for Accurate Nano-Circuits Reliability Calculations (CREDA<sup>2</sup>) Co-PI 506KAED With W. Ibrahim PI (UAEU) [UAE Natl. Res. Found.] NRF 1108-00329</li> </ul>	
2013	<ul style="list-style-type: none"> <li>– Short term travel grants (invited): TUDresden (US\$ 7,000) 7K\$</li> </ul>	

2012	– Short term travel grants (invited): EDCC'12 (US\$ 1,000)		1K\$
2011	– Short term travel grants (invited): IEEE-NANO'11 (US\$ 500), EU Brussels (US\$ 8,000), EU Paris (US\$ 5,000), NSF (US\$ 5,000), ATIC-SRC (US\$ 10,000)		28.5K\$
2011 – 2012	– Brain-inspired Hybrid Topologies for Nano-architectures [SRC 2011-RJ-2150G]	PI	40K\$
2010	– Short term travel grants (invited): IDT'10 (US\$ 500), IJCNN'10 (US\$ 1,500), INC6 (US\$ 1,000), MEES'10 (US\$ 3,000)		6K\$
2009 – 2011	– Brain-inspired Interconnects for Nanoelectronics [British Council PMI2 RCGS271]	PI	39KUK£
2009 [on hold]	– Emirates Center for Nanoscience & Nanoengineering [UAE Natl. Res. Found.]	Co-PI	50MAED
2009	– Short term travel grants (invited): EU (US\$ 7,000), U Oslo (US\$ 5,000), IEEE-NANO'09 (US\$ 1,000), ESSCIRC'09 (US\$ 1,500), NanoNet'09 (US\$ 1,000), WDSN'09 (US\$ 5,000)		20.5K\$
2008	– Short term travel grants (invited): NSF (US\$ 5,000), LANL (US\$ 2,000), SAMOS VIII (US\$ 5,000), Tohoku U (US\$ 10,000), U Paris-Sud (US\$ 3,000), U Oslo (US\$ 5,000)		33K\$
2007	– Short term travel grants (invited): NSF (US\$ 5,000), EU (US\$ 8,000), HP Labs (US\$ 6,000), FENA/UCLA (US\$ 1,000), ULSIWS'07 (US\$ 400), ISMVL'07 (US\$ 1,000), SHARCS'07 (US\$ 2,000), DTIS'07 (US\$ 3,000), DCIS'07 (US\$ 3,000), IECON'07 (US\$ 3,000), Tohoku U (US\$ 5,000), MWSCAS'07 (US\$ 1,000), IEEE-NANO'07 (US\$ 1,000), ICSPC'07 (US\$ 500), ICTRF'07 (US\$ 500), IDT'07 (US\$ 500), IWANN'07 (US\$ 5,000), NanoMaterials'07 (US\$ 500), Univ. Oslo (US\$ 5,000)		51.4K\$
2006 – 2011	– Center for Excellence in Intelligent Systems [InvestNI, IDF and U Ulster] Center for Neural Inspired Nano Architectures (~1.8MUK£, 2007–2010)	Co-PI	20.4MUK£
2007	– Mapping the proxel method to reliability analysis of nanoarchitectures [UAEU]	Co-PI	8KAED
2006	– Short term travel grants (invited): NSF (US\$ 5,000), WNEC'06 (US\$ 2,500), IDT'06 (US\$ 500), AICCSA'06 (US\$ 500)		8.5K\$
2006	– Investigation of the reliability of single electron technology gates & circuits [UAEU]	Co-PI	8KAED
2005	– Short term travel grants (invited): ICM'05 (US\$ 3,000), U Ulster (US\$ 9,000), SNB'05 (US\$ 3,000), IIT'05 (US\$ 1,000)		16K\$
2005 – 2006	– Defect-tolerant high-performance low-power computing with hybrid CMOS molecular circuits [Advanced Research & Development Agency, ARDA]	Co-PI	100K\$
2004	– Short term travel grants (invited): ASAP'04 (US\$ 500), NGCM'04 (US\$ 1,000), IJCNN'04 (US\$ 500), Heinz Nixdorf Inst. (US\$ 1,500)		3.5K\$
2003	– Short term travel grants (invited): MWSCAS'03 (US\$ 500), ICNNSP'03 (US\$ 500), NIPS'03 (US\$ 500), U Paderborn (US\$ 1,500), IJCNN'03 (US\$ 500), IWANN'03 (US\$ 500), NCI'03 (US\$ 500), Heinz Nixdorf Inst. (US\$ 2,000)		6.5K\$
2002 – 2004	– Direct Digital Frequency Synthesizers (DDFSs) for reconfigurable communication systems. DDFSs have been investigated and implemented in silicon-on-insulator (SOI) and CMOS for space applications [Air Force Research Lab/CDADIC]	Co-PI	250K\$
2002	– Short term travel grant (invited): LANL, Los Alamos (US\$ 5,000)		5K\$
2001	– Short term travel grant (invited): Berkeley Wireless Research Center (US\$ 4,000)		4K\$
2000 – 2003	– Conducting research on ultra-fast low-power floating point units (FPUs), with applications to graphic accelerators and gaming workstations [Rose Research]	PI	500K\$
2000 – 2003	– Evaluating/examining solutions for ultra-fast low-power en/decryption allowing for wire-speed (i.e., on-the-fly) VeloCypher™ crypto-processors [Rose Research]	PI	500K\$
1999 – 2005	– Pioneered <i>FastLogic</i> , an enabling VLSI technology based on novel ultra-fast logic gates, and a systematic design methodology for using them. Low-power was achieved by means of a novel self-timed power-down mechanisms, as well as differential (charge recycling) circuits. Several versions of <i>FastLogic</i> gates have been designed, simulated, tested, and patented (during 1999-2001). Ultra-low power sub-threshold versions have also been designed using an original cross-coupled adaptive body biasing scheme for boosting reliability. [Rose Research]	PI	3M\$

1999 – 2002	– Exploring alternatives and improving on ultra-fast low-power multiplication and multiply-accumulate with application to digital signal processing [Rose Research]	PI	1M\$
1999	– Short term travel grant (invited): AMS-SMM'99 (US\$ 500)		0.5K\$
1998 – 1999	– Researched, analyzed and enhanced ultra-fast VLSI adders. The theoretical results obtained have been verified and patented. [Rose Research]	PI	500K\$
1998	– Short term travel grants (invited): NC'98 (US\$ 500), CNRS-Paris (US\$ 1,000), PARELEC'98 (US\$ 500), EIS'98 (US\$ 1,000)		3K\$
1997	– Short term travel grants (invited): SBRN'97 (US\$ 5,000), IDIAP, Switzerland (US\$ 2,000), Heinz Nixdorf Inst. (US\$ 1,500), U Paris XII (US\$ 1,000), Royal Holloway U (US\$ 1,000), Oxford U (US\$ 1,000), NEuroTop'97 (US\$ 600)		12.1K\$
1996 – 1998	– Field Programmable Neural Arrays (FPNAs) as a component of the Deployable Adaptive Processing Systems (DAPS) [Los Alamos National Lab]	PI	180K\$
1996	– Short term travel grants (invited): ANITA'96 (US\$ 1,500), SBRN'96 (US\$ 2,500), AT'96 (US\$ 500)		4.5K\$
1995	– Short term travel grants (invited): ADT'95 (US\$ 500)		0.5K\$
1994 – 1996	– Programmable Neural Arrays, Design & VLSI Implementation of Neural Networks Using Threshold Gates [EU CHBICT941741]	PI	440K\$
1994	– Short term travel grants (invited): ConTI'94 (US\$ 300), EMCSR'94 (US\$ 300), RRCS'94 (US\$ 500)		1.1K\$
1993	– Short term travel grants (invited): ROSYCS'93 (US\$ 300), ESSAN'93 (US\$ 600)		0.9K\$
1992	– Short term travel grant (invited): EPFL (US\$ 500)		0.5K\$
1991	– Short term travel grants (invited): ICIAM'91 (US\$ 1,500), ICANN'91 (US\$ 1,500)		3K\$
1990 – 1991	– Negotiated, won, managed, and coordinated SPRING Software Consult contracts		
	» Dedicated En/Decryption and GUI [Ministry of National Defense]	PI	20K\$
	» CAD Training (lectures) [AVERSA SA]	PI	5K\$
	» Software Package for Microbusiness [Chemistry Research Institute]	Co-PI	10K\$
	» Data Acquisition CAD Package [Chemistry Research Institute]	PI	10K\$
	» PC Training (lectures) [Ministry of National Defense]	PI	5K\$
1990	– Short term travel grant (invited): PARCELLA'90 (US\$ 300)		0.3K\$
1988	– Dedicated watch-dog system: Feasibility study & reliability analysis [Electrical Networks Institute]	PI	50K\$
1987 – 1988	– Studied and analyzed Prolog as a research tool for circuit simulations [UPB]	Co-PI	
1987	– Short term travel grant (invited): ComEuro'87 (US\$ 400)		0.4K\$
1987	– Dedicated Database Package [National Information & Documentation Institute]	PI	50K\$
1987	– Hierarchical Self-testable and Self-repairable Content Addressable Memory [UPB]	PI	50K\$
	– High Speed Antialiasing Cascadable Circuit [UPB]	PI	50K\$
1984 – 1987	– VLSI CAD Package (PC version) [UPB]	PI	100K\$
	– Automatic Conical Ball Bearing Sorter [Bearings Factory Alexandria, now Koyo]	PI	100K\$
1983	– Mutual exclusion circuit (patented) [Research Institute for Computer Techniques]	PI	
	– Floppy disk interface [Research Institute for Computer Techniques]		
1981 – 1982	– Ultra high-speed floating point unit. New improved algorithms with innovations at the microprogramming level [Research Institute for Computer Techniques]	PI	
1981	– Ultra high-speed highly reliable central processing unit with enhancements at the microprogramming level [Research Institute for Computer Techniques]	PI	
1980	– Involved in the final testing stages of the CE-100 computer (PDP equivalent)	Co-PI	
1979 – 1980	– High speed graphic workstation: 1024×1024 with 16 intensities [UPB] 20 MHz HP vectorial display and original CPU design (tested at 60 MHz) » Three Best Paper Awards at the Students' Scientific Research Conference » Best MSc Thesis Award for "innovations in workstation design"		5K\$
1977 – 1980	– National Merit Scholarship [Ministry of Science & Education]		10K\$

## RESEARCH PARTICIPATED

- 1996 – 1998 – The Deployable Adaptive Processing Systems (DAPS) carried out at Los Alamos National Laboratory (LANL). This was a multi-faceted R&D program, developing algorithms and prototyping systems for real-time remote and autonomous processing of data gathered on land, in the air, or in space. Specified and designed neural-inspired adaptive algorithms and their mapping onto FPGAs.
- 1992 – 1994 – VLSI-efficient threshold logic gates (Concerted Research Action of the Flemish Community).
- 1991 – One of the experts of DEANNA (Data-base for European Artificial Neural Network Activity), an ESPRIT exploratory action led by JENNI (Joint European Neural Network Initiative).

## OTHER RESEARCH RELATED ACTIVITIES

- 20 PATENTS** • 10 USA, 3 WIPO, 3 Australia, 3 Taiwan, 1 Romania — *single author on all of them*
- 133 CONFERENCES ORGANIZED** • RRCS'94, ANITA'96, NEuroFuzzy'96, NeuroTop'97, SBRN'97, EIS'98, SOCO'99, EIS'00, SBRN'00, IWANN'03, NCI'03, IJCNN'04, IJCNN'05, NanoArch'05, ICMENS'06, IDT'06, IEEE-NANO'06, IEEE SoC'06, IJCNN'06, NanoArch'06, WSC-11, IDT'07, IIT'07, IEEE SoC'07, IJCNN'07, MCSoc'07, NanoArch'07, WSC-12, DCS'08, IDT'08, MIM-MMN'08, NanoArch'08, NDCCS'08, VTS'08, WSC-13, DTIS'09, ICMLA'09, IJCNN'09, MIM-MMN'09, NanoArch'09, NanoNet'09, WSC-14, BCN'10, BIONETICS'10, ICTITA'10, IDT'10, MIM-MMN'10, MCSoc'10, NanoArch'10, NanoNet'10, SBCCI'10, WAC'10, WSC-15, ICMLA'11, IDT'11, MIM-MMN'11, MoNaCom'11, NaBIC'11, NanoArch'11, SBCCI'11, ISIE'12, MIM-MMN'12, MoNaCom'12, NaBIC'12, NanoArch'12, OPTIM'12, SBCCI'12, WICT'12, WSC-16, DTIS'13, ICECS'13 (*track chair*), IDT'13, IIT'13, IJCNN'13, MIM-MMN'13, MoNaCom'13, NanoArch'13, SBCCI'13, VLSI-SoC'13, BICT'14, BioTL'14, DTIS'14, I4CT'14, ICECS'14 (*track chair*), ICNC'14, IIT'14 (*chair*), IDT'14, ISCAS'14, MIM-MMN'14, NanoArch'14, NanoCom'14, SBCCI'14, SSCI'14, WSC-18, DTIS'15, ECCTD'15, ICECS'15 (*track chair*), IDT'15, IJCNN'15, MIM-MMN'15, NaBIC'15, NanoArch'15, NanoCom'15, SBCCI'15, SSCI'15, DTIS'16, ICCCC'16, ICECS'16 (*publicity chair*), IDT'16, ISCAS'16, MIM-MMN'16, SETIT'16, SOFA'16, DTIS'17, ISCAS'17, ICML'17, ISPACS'17, SoCPar'17, DTIS'18, ICCCC'18, ISREIE'18, SETIT'18, SOFA'18, WSC'18, DTIS'19, ECC'19, VTCA'19, DTIS'20, ICCCC'20, MWSCAS'20, SOFA'20, ICCCC'22, SOFA'22
- 67 SESSIONS CHAIRED** • CSCS'93, ROSYCS'93, RRCS'94, ConTI'94, ADT'95, CSCS'95, IWANN'95, NeuroTop'97, CSCS'97, EANN'97, SOCO'97, EIS'98 (2×), PARELEC'98, NC'98, ISCAS'00, MWSCAS'00 (2×), NCI'03 (2×), IWANN'03, ICANN'03, SCS'03, IJCNN'03, NIPS'03 (2×), MWSCAS'03, IJCNN'04 (2×), IJCNN'05, IIT'05, VLSI-SoC'05, ICM'05, AICCSA'06 (2×), IIT'06, ISMVL'07, IWANN'07, IEEE-NANO'07, DCIS'07, GCoE'07, ARC'08, GCoE'08, ISCAS'08, ARC'09, NanoNet'09, IDT'10, IEEE-NANO'11, EDCC'12, IEEE-NANO'12, DTIS'13, ICECS'13 (3×), IIT'14, ICCCC'16, SOFA'16 (2×), ISREIE'16, ICCCC'18, ISREIE'18, SOFA'18, ECC'19 (2×), ICCCC'20, SOFA'20, ICCCC'22
- 232 INVITATIONS REVIEWER** • 14 sessions/workshops, 28 plenary/keynote, 19 tutorials, 52 lectures, and 119 presentations
- USA National Science Foundation (28× since 2002), EU European Commission (6× since 2007), Belgium (2005, 2009), Cyprus (2009, 2010), Switzerland (2006, 2008), UAE (12×), Romania (29×)
- Journals: IEEE T. Nano., Nanotech., J. Nanotech., ACM JETC, IEEE T. VLSI, IEEE T. CAS, IEEE T. Design & Test, IEEE T. CAD, IEEE T. Comp., IEEE T. Sys. Man & Cyber., Microelectr., Integr. VLSI J., Electr. Lett., J. VLSI, J. Circ. Th. & Appls., Solid State Electr., IEEE T. Neural Nets, Neural Nets., Neural Net. World, Neural Proc. Lett., Intl. J. Neural Syst., Microelectr. J., New J. Phys., Biol. Cyber.
- Conferences (besides those organized): ADT'95, IJCNN'03, IIT'05, IWANN'05, IIT'06, ISCAS'06, ICSPC'07, ISIE'07, ISCAS'07, VTS'07, IECON'08, ISCAS'08, IJCNN'08, IECON'09, ICMLA'09, IIT'09, ISIE'10, ISSCI'10, MWSCAS'10, Optim'10, ECCTD'11, IEEE-NANO'11, IIT'11, IJCNN'11, MoNaCom'11, ESANN'12, IDT'12, IIT'12, IJCNN'12, DTIS'13, ADVCI'14, I4CT'14, IJCNN'14, ISCAS'15, WSC'15, MWSCAS'17, SoCPar'17, MWSCAS'18, MWSCAS'19, MWSCAS'22
- Intl. Assoc. Sci. Tech. Dev. (IASTED), Intl. Soc. Mini & Microcomp. (ISMM), Intl. Comp. Sci. Conventions (ICSC), Natl. Info. & Documentation Inst. (INID)
- Books (5), PhD theses (16), MSc theses (6)

**RESEARCH PLANS** *"Success ... going from failure to failure with undiminished enthusiasm." Winston Churchill*

- SHORT TO**
- Atto-Joule designs based on novel enabling reliability-optimal arrays of devices
- MEDIUM**
- Practical (economical) fault-tolerant communication and computations (from both devices and wires)
- TERM**
- Beyond CMOS reliability-power-delay designing (SET, NEMS, magnetic, molecular, photonic, fluidic)
- LONG TERM**
- **Bio-/brain-inspired nano-circuits/architectures for innovative information processing**
- BIO-INSPIRED
- Designing innovative adaptive bio-/brain-inspired VLSI circuits and nano-architectures, allowing for low-power (near-threshold, mixed digital/analog, SET, NEMS, photonic, fluidic) and fault-tolerant (novel device-level redundancy schemes) large scale array-based information processing systems.
- NANO-CIRCUIT
- Biological computing blocks rely on a few bits, suggesting digit-wise computations in a base larger than two. Low-precision 'analog' blocks could be synthesized base on Kolmogorov's superposition.
- ARCHITECTURES
- The outputs of 'analog' blocks should be combined by cyclic (i.e., with feedback) digital circuits. This could interface directly to analog inputs, and would also merge memory with computations.
- HIGH LEVEL
- AUTOMATIC
- SYNTHESIS
- ACCURATE EDA
- Reliability calculations should start from devices and wires (not from gates), and modeling should include device variations, defects, and noises. GREDA (Gate Reliability EDA) was developed for very accurate gate reliability estimates. GREDA's results were taken to the system level by CR-EDA<sup>2</sup> (Circuit Reliability EDA for Evaluating Design Alternatives). Both tools are Bayesian-based and consider input vectors, device variations, and noises. Noises on wires and various non-Gaussian distributions have been investigated jointly with novel (patentable) statistical design concepts.
- ALGORITHMS
- FOR RELIABILITY

**APPLICATIONS**

- SMART
- An interesting application is represented by smart/associative memory. A content addressable memory (CAM) is looking for an exact match. Typical examples include: the cache and the virtual page addressing (microprocessors), and the address lookup (Internet servers). A bio-inspired associative memory relies on best-match, returning one or more matches sorted by a given metric. Advantages: could deal with missing data and errors, could generalize, etc.
- ASSOCIATIVE
- MEMORIES
- HIGH-PERF
- The plan here is to evaluate solutions for ultra-fast en/decryption allowing for wire-speed implementation of public-key (e.g., RSA, ECC) and symmetric key (e.g., AES) cryptosystems. Algorithms for en/decoding (e.g., JPEG, MPEG, etc., based on FFT/DCT) should also be targeted.
- EN/DECRYPTION
- EN/DECODING

**AWARDS** *"Results! ... I know several thousand things that won't work." Thomas Edison*

**3 VISITING**

- |             |                                   |                                   |
|-------------|-----------------------------------|-----------------------------------|
| 2015        | • Erasmus Mundus (Visiting Prof.) | European Union (TU Dresden/CfAED) |
| 2013        | • Erasmus Mundus (Nano Scholar)   | European Union (TU Dresden/CfAED) |
| 2005 – 2011 | • Visiting Professor              | Ulster University (UK)            |

**5 FELLOWSHIPS**

- |             |                                      |                                               |      |
|-------------|--------------------------------------|-----------------------------------------------|------|
| 1999 – 2001 | • Rose Research Fellowship           | Rose Research (USA)                           | 0.1% |
| 1996 – 1998 | • Director's Postdoctoral Fellowship | Los Alamos National Laboratory (USA)          | 1.0% |
| 1994 – 1996 | • HCM Research Fellowship            | European Union (King's College London, UK)    | 0.1% |
| 1993 – 1994 | • Research Fellowship                | Concerted Research Action (Flemish Community) |      |
| 1991        | • Fulbright Fellowship               | Fulbright Commission (USA)                    | 0.1% |

**2 SCHOLARSHIPS**

- |             |                              |                                           |      |
|-------------|------------------------------|-------------------------------------------|------|
| 1991 – 1993 | • Doctoral Scholarship       | Katholieke Universiteit Leuven (Belgium)  | 1.0% |
| 1975 – 1980 | • National Merit Scholarship | Ministry of Science & Education (Romania) | 0.1% |



## OTHER RECOGNITIONS

2022	• Excellence Award	UAV	1.0%
2022	• <i>Top 2% scientists worldwide</i>	Stanford & Scopus (10.17632/btchxktzyw.5)	2.0%
2021	• <i>Top 2% scientists worldwide</i>	Stanford & Scopus (10.17632/btchxktzyw.4)	2.0%
2020	• <i>Top 2% scientists worldwide</i>	Stanford & Scopus (10.17632/btchxktzyw.3)	2.0%
2020	• Best Paper Award	ICCCC'20	2.0%
2018	• Best Paper Award	IEEE ICCCC'18	2.0%
2017	• Excellence Award	UPB	1.0%
2016	• Excellence Award	UAV	1.0%
2009	• Research Affairs Recognition Award	UAEU	1.0%
2009	• Best Excellence in Scholarship Award	UAEU, College of IT	2.0%
2008	• Best Paper Award	UAEU Annual Research Conference	1.0%
2003	• Three Patents		
2002	• Nine Patents		
2001	• US resident under extraordinary ability " <i>VLSI implementations of neural networks</i> "		
2001	• Seven Patents		
2000	• Best Paper Award	IEEE CAS'2000	1.0%
1996	• Senior Member	IEEE	8.0%
1994	• PhD <i>summa cum laude</i>	Katholieke Universiteit Leuven (Belgium)	5.0%
1984	• One Patent	Romanian PTO (1)	
1980	• Best MSc Thesis Award	UPB	1.0%
1980	• Best Paper Awards (three times)	UPB	1.0%
1977	• Best Paper Awards (two times)	University "Politehnica" of Bucharest (UPB)	1.0%
1975	• Highest Award (at graduation)	National College of Informatics	0.5%
1971 – 1975	• Gold Medal/First Prize (four times)	Romanian Physics Olympiad	0.1%

## ADDITIONAL

## INFORMATION

### MEMBERSHIP

1999	– Marie Curie Fellowship Association	MCFA
	– Association for Computing Machinery (#5155023)	ACM
1992	– Institute of Electrical and Electronics Engineering (#03089455) – <i>Senior Member</i>	IEEE
	– International Neural Network (#7212)	INNS
1991	– European Neural Network Society – <i>Founding Member</i>	ENNS
	– Expert of the Romanian Academy of Science	
1979	– Lions Club International (Centre International de Rencontres Universitaire)	CIRU

### MISCELLANEOUS

2019 – ...	UAV Faculty of Exact Sciences College Council	Member
2017 – 2018	MEN CNATDCU (Ministry of Education Decree nr. 3991/06.06.2017)	<i>Member</i>
2013 – 2015	UAEU Promotion Advisory Group	Member
2009 – 2015	UAEU Mubadala Technology (previously ATIC) Advisory Board	Member
2013 – 2015	CIT Promotion Committee	<i>Chair</i>
2005 – 2013	CIT Promotion Committee (except 2007 – 2008)	Member
2014 – 2015	CIT Peer Evaluation of Teaching (PET) Committee	Member
2010 – 2013	UAEU Council (representing CIT)	Member
2008 – 2013	UAEU Graduate Research Studies Board	Member
2008 – 2011	UAEU Graduate Council	Member
2007 – 2009	UAEU Technical Task Force (inspecting and receiving the new CIT building)	Member
2006 – 2010	UAEU Research Affairs Committee	Member



2006 – 2007	UAEU IT Receiving Committee	Member
2011 – 2013	CIT Research Committee	Member
2011 – 2012	CIT Graduate Program Committee	Member
2009 – 2011	CIT Graduate Program Committee	<i>Chair</i>
2005 – 2011	CIT Research & Graduate Studies Committee	<i>Chair</i>
2005 – 2008	CIT Laboratories & Equipment Committee	<i>Chair</i>
2005 – 2006	CIT Recruitment Committee	<i>Chair</i>
2006 – 2011	CIT Strategic Planning Committee	Member
2006 – 2010	CIT Recruitment Committee	Member
2006 – 2009	CIT Honors Committee	Member
2006 – 2007	CIT Academic Performance Assessment Committee	Member
2005 – 2011	CIT College Council	Member
2005 – 2008	CIT Curriculum Committee	Member
2023	External examiner for a PhD thesis (member of the examination committee)	
2022	External examiner for two PhD theses (member of the examination committee)	
2009	External examiner for a PhD thesis (member of the examination committee)	
2008	External examiner for four PhD theses (member of the examination committee)	
2007	External examiner for a PhD thesis (member of the examination committee)	
	External examiner HCT Men's College, Abu Dhabi (9 students, 4 projects)	
2006	External examiner for a PhD thesis (member of the examination committee)	
2005	External examiner for a PhD thesis (member of the examination committee)	
[...]		
2001 – 2005	• Member of the EECS Graduate Studies Committee	WSU
2001 – 2005	• Member of the Computer Engineering (Program) Committee	WSU
1998 – 2001	• International Computer Science Conventions/Academic Advisory Board	ICSC
1997 – 1998	• <i>Program Chairman</i> of the IEEE Los Alamos Section	LANL
1985 – 1990	• <i>Secretary</i> of the MSc Examination Board	UPB
1987 JULY	– <i>Chair</i> of the Students' National Computer Training Camp (Sinaia, Romania)	UPB
1985 – 1990	– <i>Chair</i> of the Students' Group for Scientific Computer Research	UPB
2022 – ...	• <i>Editorial Board</i> Frontiers in Neuro Science	Frontiers
2021 – ...	• <i>Editorial Board</i> Mathematics	MDPI
2020 – ...	• <i>Editorial Board</i> Applied Sciences	Springer
2010 – 2016	• <i>Associate Editor</i> Nano Communication Networks	Elsevier
2011 – 2015	• <i>Associate Editor</i> IEEE Transactions on VLSI Systems	IEEE
2009	• Emerging Technologies Group on Nanoscale Communications	IEEE
2005 – 2008	• <i>Associate Editor</i> IEEE Transactions on Neural Networks	IEEE
2006 –	• Established and leading <i>Nano-ART = Nano Architectural Research Team</i>	
2005	• Task Force on Nano Architectures	IEEE-CS
2003	• Member of the Novel Nanoarchitectures Study Group CW4	SRC-NNI
2023 reviews	– (ongoing)	1 PhD 31 journals 2 conferences
2022 reviews	–	10 Romania 2 PhD 33 journals 8 conferences
2021 reviews	–	5 Romania 1 PhD 15 journals 12 conferences
2020 reviews	–	1 Romania 16 journals 18 conferences
2019 reviews	–	1 Romania 7 journals 8 conferences
2018 reviews	–	2 Romania 17 journals 14 conferences
2017 reviews	–	3 Romania 5 journals 9 conferences
2016 reviews	–	9 Romania 2 journals 22 conferences
2015 reviews	–	8 journals 42 conferences

2014 reviews	– 1 NSF					30 journals	45 conferences
2013 reviews	– 1 NSF					31 journals	58 conferences
2012 reviews	–				2 MSc	33 journals	46 conferences
2011 reviews	– 7 NSF	2 EU				19 journals	31 conferences
2010 reviews	–	1 EU		1 Cyprus		14 journals	24 conferences
2009 reviews	–	1 EU	1 Belgium	1 Cyprus	1 PhD	13 journals	25 conferences
2008 reviews	– 8 NSF	1 EU	1 Switzerland		4 PhD	15 journals	33 conferences
2007 reviews	– 9 NSF	1 EU			1 book 1 PhD	9 journals	28 conferences
2006 reviews	– 1 NSF		1 Switzerland		2 books 1 PhD	15 journals	15 conferences
2005 reviews	– 1 NSF		1 Belgium		1 book 1 PhD	5 journals	11 conferences
[...]							

## LINKS

### TO PRESENTATIONS / PUBLICATIONS

- 2020
  - Employing Sorting Nets for Designing Reliable Computing Nets  
IEEE International Conference on Nanotechnology, virtual, July 29-31, 2020  
<https://ieeetv.ieee.org/ondemand/employing-sorting-nets-for-designing-reliable-computing-nets>
- 2020
  - Land of the Giants ... AI Chips  
International Conference on Computers Communications & Control ICCCC'20  
Baile Felix/Oradea, Romania, May 11-15, 2020  
[http://univagora.ro/m/filer\\_public/2020/05/20/beiu.pdf](http://univagora.ro/m/filer_public/2020/05/20/beiu.pdf)
- 2014
  - Bio-Inspired Designing with Arrays  
CMOS Emerg. Tech. Res. CMOSETR'14, Grenoble, France, July 8, 2014  
<https://books.google.ca/books?id=OL3aAwAAQBAJ&pg=PA102>
- 2013
  - Why Biology Can ... and ... Silicon Can't?  
TUDresden, Germany, July 11, 2013, <https://nano.tu-dresden.de/seminar/1089>
  - The Brain – A Gentle Introduction Clearing Misconceptions  
TUDresden, Germany, April 11, 2013, <https://nano.tu-dresden.de/seminar/1103>
- 2010
  - On Brain Inspired Nano Interconnects (tutorial)  
IEEE Intl. Joint Conf. Neural Nets. IJCNN'10, Barcelona, Spain, July 18, 2010  
<https://cis.ieee.org/professional-development/video-library>  
[https://ieeetv.ieee.org/player/embed\\_play/130009/videowidth](https://ieeetv.ieee.org/player/embed_play/130009/videowidth)  
[https://ieeetv.ieee.org/player/embed\\_play/130008/videowidth](https://ieeetv.ieee.org/player/embed_play/130008/videowidth)
  - Trustworthy Wings of the Mysterious Butterflies  
Intl. Nanotech. Conf. INC6, Grenoble, France, May 19, 2010
- 2003 – 2015
  - Semiconductor Research Corporation (publications)  
<https://www.src.org/texis/search/?pr=webprod&query=Beiu>
- Since 1996
  - Los Alamos National Laboratory (publications)  
<https://www.lanl.gov/library/find/reports/index.php>  
<https://www.osti.gov/search/semantic:Beiu>

### RELATED TO VITA

- 1971 – 1975
  - “Tudor Vianu” National College of Informatics <http://portal.lbi.ro/>
- 1975 – 1980
  - University “Politehnica” of Bucharest <https://upb.ro/en/>  
Faculty of Control & Computers <https://acs.pub.ro/en/home/about-us/>  
CS&E Department <https://cs.pub.ro/>  
MSc supervisor [https://ro.wikipedia.org/wiki/Mircea\\_Petrescu](https://ro.wikipedia.org/wiki/Mircea_Petrescu)

1980 – 1982	• Research Institute for Computer Techniques	<a href="https://www.itc.ro/">https://www.itc.ro/</a>
1982 – 2001	• University “Politehnica” of Bucharest Faculty of Control & Computers CS&E Department	<a href="https://upb.ro/en/">https://upb.ro/en/</a> <a href="https://acs.pub.ro/en/home/about-us/">https://acs.pub.ro/en/home/about-us/</a> <a href="https://cs.pub.ro/">https://cs.pub.ro/</a>
1991 – 1994	• Katholieke Universiteit Leuven Faculty of Engineering EE Department (ESAT) PhD supervisor	<a href="https://www.kuleuven.be/english/">https://www.kuleuven.be/english/</a> <a href="https://eng.kuleuven.be/en">https://eng.kuleuven.be/en</a> <a href="https://www.esat.kuleuven.be/english/">https://www.esat.kuleuven.be/english/</a> <a href="https://www.esat.kuleuven.be/stadius/person.php?id=18">https://www.esat.kuleuven.be/stadius/person.php?id=18</a>
1994 – 1996	• EU HCM Fellowship	<a href="http://cordis.europa.eu/tmr/src/grants/chbi/chbig_ro.htm">http://cordis.europa.eu/tmr/src/grants/chbi/chbig_ro.htm</a> [not active anymore; old link archived in 2009]
	• King’s College London School of Natural & Mathematical Sciences Department of Mathematics Centre for Neural Networks	<a href="https://www.kcl.ac.uk/">https://www.kcl.ac.uk/</a> <a href="https://www.kcl.ac.uk/nmes/">https://www.kcl.ac.uk/nmes/</a> <a href="https://www.kcl.ac.uk/mathematics/">https://www.kcl.ac.uk/mathematics/</a> <a href="http://www.mth.kcl.ac.uk/cnn/">http://www.mth.kcl.ac.uk/cnn/</a> [old link; not active]
	See Scientific advisor	<a href="https://www.kcl.ac.uk/mathematics/about/history-of-the-department">https://www.kcl.ac.uk/mathematics/about/history-of-the-department</a> <a href="https://en.wikipedia.org/wiki/John_G._Taylor">https://en.wikipedia.org/wiki/John_G._Taylor</a>
1996 – 1998	• Los Alamos National Laboratory Nonproliferation & International Security	<a href="https://www.lanl.gov/">https://www.lanl.gov/</a> <a href="http://nis-www.lanl.gov/">http://nis-www.lanl.gov/</a> [old link; changed]
1998 – 2001	• RN2R/Rose Research LLC	<a href="https://patents.justia.com/assignee/rn2r-l-l-c">https://patents.justia.com/assignee/rn2r-l-l-c</a>
2001 – 2005	• Washington State University School of EE&CS	<a href="https://wsu.edu/">https://wsu.edu/</a> <a href="https://school.eecs.wsu.edu/">https://school.eecs.wsu.edu/</a>
2005 – 2011	• University of Ulster Intelligent System Research Centre	<a href="https://www.ulster.ac.uk/">https://www.ulster.ac.uk/</a> Revamped/updated (several times since inception) <a href="https://www.ulster.ac.uk/research/topic/computer-science/intelligent-systems-research-centre">https://www.ulster.ac.uk/research/topic/computer-science/intelligent-systems-research-centre</a>
2005 –	• United Arab Emirates University College of Information Technology	<a href="https://www.uaeu.ac.ae/en/">https://www.uaeu.ac.ae/en/</a> <a href="https://cit.uaeu.ac.ae/en/">https://cit.uaeu.ac.ae/en/</a>
	<a href="https://uaeu.pure.elsevier.com/en/searchAll/index?search=Beiu">https://uaeu.pure.elsevier.com/en/searchAll/index?search=Beiu</a>	
2015 –	• “Aurel Vlaicu” University of Arad	<a href="https://uav.ro/en/">https://uav.ro/en/</a>

<b>PUBLICATIONS</b>	<b>306</b>	<b>38 INVITED AND 8 BEST PAPER AWARDS (BESIDES 53 OTHER CONFS. AND 73 TECH. REP.)</b>		
<b>CITATIONS</b>	<b>1888</b>	<b>HAND COUNTED (EXCLUDING SELF-CITATIONS) – UPON REQUEST</b>	<b>PUBLICATIONS</b>	<b>H INDEX</b>
~900/600	944/613	<b>Web of Science</b> (all/excluding self-citation all databases)	162	<b>15</b>
~1400	1433	<b>Scopus</b> (all, i.e., including self-citations) <a href="https://www.scopus.com/authid/detail.uri?authorId=57208794980">https://www.scopus.com/authid/detail.uri?authorId=57208794980</a>	180	<b>18</b>
~2100	2113	<b>Semantic Scholar</b> (all, i.e., including self-citations)	248 (81 HIC)	
	1307	<a href="https://www.semanticscholar.org/author/Valeriu-Beiu/50582498">https://www.semanticscholar.org/author/Valeriu-Beiu/50582498</a>	139 (48 HIC)	20
	806	<a href="https://www.semanticscholar.org/author/Valeriu-Beiu/49071642">https://www.semanticscholar.org/author/Valeriu-Beiu/49071642</a>	109 (34 HIC)	13
~3000	2967	<b>Google Scholar</b> (all, i.e., including self-citations) <a href="https://scholar.google.com/citations?user=u_PrFwAAAAJ">https://scholar.google.com/citations?user=u_PrFwAAAAJ</a>	331	<b>26</b>

<b>INVITED</b>	<b>ORGANIZED/PRESENTED</b>	<b>PENDING</b>
<b>SESSIONS/WORKSHOPS</b>	14	
<b>KEYNOTE/PLENARY/PANEL</b>	28	
<b>TUTORIALS</b>	19	
<b>LECTURES/SEMINARS</b>	52	
<b>PRESENTATIONS</b>	73	
<b>PRESENTATIONS TO INDUSTRY</b>	46	
<b>TOTAL</b>	<b>232</b>	

**INVITED SESSIONS/WORKSHOPS 14**

- S<sub>14</sub> L. Daus, R.-M. Beiu, and V. Beiu: Trustworthy & Green Design  
International Conference on Computers, Communications and Control ICCCC 2022  
Baile Felix, Oradea, Romania, May 16-20, 2022 Session
- S<sub>13</sub> M. Jianu, V.-F. Dragoi, and V. Beiu: Rebooting Reliability – From Maths to Circuits  
International Workshop on Soft Computing Applications SOFA 2020  
Virtual conference (<https://www.sofa-org.eu/2020/>), November 27-29, 2020 Session
- S<sub>12</sub> V. Beiu: On Brain-Inspired Nano-Architectures  
International Conference on Computers, Communications and Control ICCCC'20  
Virtual conference, May 11-15, 2020 Session
- S<sub>11</sub> V. Beiu: On Brain-Inspired Nano-Architectures  
IEEE International Conference on Computers, Communications and Control ICCCC'18  
Baile Felix, Oradea, Romania, May 08-12, 2018 Session
- S<sub>10</sub> R. Andonie, D. Davendra, and V. Beiu: Computational Intelligence Methods  
IEEE International Conference on Computers, Communications and Control ICCCC'16  
Baile Felix, Oradea, Romania, May 10-14, 2016 Session
- S<sub>9</sub> V. Beiu, and W. Ibrahim: Towards Brain Inspired Interconnects and Circuits  
International ICST Conference on Nano-Networks Nano-Net'09  
Luzern, Switzerland, October 18, 2009 Workshop
- S<sub>8</sub> M.J. Avedillo, J.M. Quintana, and V. Beiu: Emerging Technologies Applied to Nanoelectronics  
IEEE International Conference on Design of Circuits and Integrated Systems DCIS'07  
Seville, Spain, November 22, 2007 Session
- S<sub>7</sub> U. Rückert, and V. Beiu: Neural Inspired Architectures for Nanoelectronics  
International Work-Conference on Artificial Neural Networks IWANN'07  
San Sebastian, Spain, May 19, 2007 Session
- S<sub>6</sub> V. Beiu, and U. Rückert: Brain Inspired Emerging Nanoarchitectural Design and Technical Challenges  
IEEE International Joint Conference on Neural Networks IJCNN'04  
Budapest, Hungary, July 28, 2004 Session
- S<sub>5</sub> V. Beiu, and U. Rückert: Neural-inspired Architectures for Nanoelectronics  
Neural Information Processing Systems NIPS'03  
Whistler, Canada, December 12-13, 2003 Workshop
- S<sub>4</sub> V. Beiu: Threshold Gates – Past, Present, and Future  
International Work-Conference on Artificial Neural Networks IWANN'03  
Menorca, Spain, June 4, 2003 Session

S <sub>3</sub>	V. Beiu: The Next Generation of Neural Networks Chips International ICSC Symposium on Engineering of Intelligent Systems EIS'98 Tenerife, Spain, February 9, 1998	Session
S <sub>2</sub>	R. Andonie, and V. Beiu: International Workshop on Neural Research Priorities NeuroTop'97 Braşov, Romania, May 27-28, 1997	Workshop
S <sub>1</sub>	V. Beiu, and R. Andonie: Shaping the Hardware Solutions for the Third Millennium ANITA'96 Uppsala, Sweden, December 9-10, 1996	Workshop

**INVITED KEYNOTE/PLENARY/PANEL**

**28**

K <sub>28</sub>	V. Beiu: A Brave New World ... Manufactured with Atomic Precision International Workshop on Soft Computing Applications SOFA2022 Arad, Romania, November 21-23, 2022 ( <a href="https://2022.sofa-org.eu/invited-speakers/">https://2022.sofa-org.eu/invited-speakers/</a> )	Keynote
K <sub>27</sub>	V. Beiu: A(nother) Game of Shadows International Conference on Computers, Communications and Control ICCCC'22 Baile Felix, Oradea, Romania, May 16-20, 2022 ( <a href="http://univagora.ro/en/icccc2022/keynote/">http://univagora.ro/en/icccc2022/keynote/</a> )	Keynote
K <sub>26</sub>	V. Beiu: The Unfolding Road from Dust to Trust International Conference Advances in 3OM, Timisoara, Romania, December 13-16, 2021 <a href="http://3om-group-optomechatronics.ro/advances-in-3om-conference-2021/plenary-speakers/">http://3om-group-optomechatronics.ro/advances-in-3om-conference-2021/plenary-speakers/</a>	Keynote
K <sub>25</sub>	V. Beiu: Chips (Shortages), Technology and Taxes International Students' Scientific Communications Session SICSS 2021 Arad, Romania, June 5, 2021	Plenary
K <sub>24</sub>	V. Beiu: Why Reliability Is Such a Nemesis – Rebooting Computing Reliability International Workshop on Soft Computing Applications SOFA'20 Virtual conference, November 27-29, 2020 ( <a href="https://www.sofa-org.eu/2020/">https://www.sofa-org.eu/2020/</a> )	Keynote
K <sub>23</sub>	V. Beiu: Quantum AI from the Ground Up International Students' Conference StudMath-IT 2020 Virtual conference, November 26-27, 2020 ( <a href="https://studmathit.uav.ro/">https://studmathit.uav.ro/</a> )	Keynote
K <sub>22</sub>	V. Beiu: Rise of the AI Chips International Students' Scientific Communications Session SICSS 2020 Virtual conference, June 27, 2020 ( <a href="https://aurelvlaicuuniversityofarad.my.webex.com/meet/balas">https://aurelvlaicuuniversityofarad.my.webex.com/meet/balas</a> )	Keynote
K <sub>21</sub>	V. Beiu: Land of the Giants ... AI Chips International Conference on Computers, Communications and Control ICCCC'20 Virtual conference, May 11-15, 2020 ( <a href="http://univagora.ro/en/icccc2020/keynote/">http://univagora.ro/en/icccc2020/keynote/</a> )	Keynote
K <sub>20</sub>	V. Beiu: Why AI Hardware Makes (Perfect) Sense Now Euro-China Conference on Intelligent Data Analysis and Applications ECC'19 Arad, Romania, October 15-18, 2019 ( <a href="https://www.ecc2019.ro/invited-speaker/">https://www.ecc2019.ro/invited-speaker/</a> )	Keynote
K <sub>19</sub>	V. Beiu: Seeing is Believing International Workshop on Soft Computing Applications SOFA'18 Arad, Romania, September 15, 2018	Keynote
K <sub>18</sub>	V. Beiu: Photonics and the Brain International Conference on Lasers in Medicine ICLM'17 Timisoara, Romania, July 15, 2017	Plenary
K <sub>17</sub>	V. Beiu: Why the Brain Can and the Computer Can't International Workshop on Soft Computing Applications SOFA'16 Arad, Romania, August 25, 2016	Keynote

–	V. Beiu: Brain versus Computer Revisited Asia-Pacific Conference on Electrical Electronics and Engineering AEEE'15 Dubai, UAE, November 18-19, 2015 [Canceled]	Keynote
K <sub>16</sub>	V. Beiu: On the Reliability Accuracy Challenge – Grappling with a Seemingly Intractable Problem European Dependable Computing Conference EDCC'12 Sibiu, Romania, May 11, 2012	Keynote
K <sub>15</sub>	T.G. Noll, P. Horn, N. Menezes, V. Beiu, and D. Hammerstrom Alternative Minimum-Energy Computing Paradigms (Brain-inspired Information Processors) International Forum on Minimum Energy Electronic Systems MEES'10 Abu Dhabi, UAE, May 23-24, 2010	Panel
K <sub>14</sub>	V. Beiu: Trustworthy Wings of the Mysterious Butterflies (Brain-inspired Information Processing) International Nanotechnology Conference on Communication and Cooperation INC6 Grenoble, France, May 19, 2010	Keynote
K <sub>13</sub>	V. Beiu: Connectivity and Scalability Issues for Biologically Plausible Nano-electronic Systems International Workshop on Brain-Inspired Electronic Circuits & Systems BIECS'09/ESSDERC'09 Athens, Greece, September 18, 2009	Keynote
K <sub>12</sub>	C. Constantinescu, J.A. Abraham, V. Beiu, H. Naeimi, A. Somani, and S. Wang Scaling Towards Nanometer Size Devices – Issues and Solutions Workshop on Dependable and Secure Nanocomputing WDSN'09 (IEEE/IFIP DSN'09) Estoril/Lisbon, Portugal, June 29, 2009 <a href="http://webhost.laas.fr/TSF/WDSN09/WDSN09_files/Slides/WDSN09_12-Beiu.pdf">http://webhost.laas.fr/TSF/WDSN09/WDSN09_files/Slides/WDSN09_12-Beiu.pdf</a>	Panel
K <sub>11</sub>	V. Beiu: Electrons Behaving Badly Information Electronics Systems Global Center of Excellence GCoE'08 Tohoku University, Sendai, Japan, July 14, 2008	Plenary
K <sub>10</sub>	S. Bhabhu, R.A. Parekhji, M. Nicolaidis, V. Beiu, and M.Y. Zhang Mitigating Reliability, Yield and Power Issues in Nano-CMOS: Design or EDA Problem? IEEE International VLSI Test Symposium VTS'08, San Diego, CA, USA, April 30, 2008	Panel
K <sub>9</sub>	V. Beiu: Quo Vadis Nano-electronics Information Electronics Systems Global Center of Excellence GCoE'07 Tohoku University, Sendai, Japan, November 27, 2007	Plenary
K <sub>8</sub>	V. Beiu: What Do Shannon, von Neumann, Kolmogorov, and Feynman Have to Do with ... Moore? IEEE International Symposium on Multiple Valued Logic ISMVL'07 Oslo, Norway, May 14, 2007	Plenary
K <sub>7</sub>	V. Beiu: What Do Moore, von Neumann and Kolmogorov Have in Common? IEEE International Conference on Computer Systems and Applications AICCSA'06 Sharjah, UAE, March 9, 2006	Keynote
K <sub>6</sub>	V. Beiu: The Quest for Reliable Nano Computations IEEE International Conference on Microelectronics ICM'05 Islamabad, Pakistan, December 13, 2005	Plenary
K <sub>5</sub>	U. Rükert, and V. Beiu: Neural Inspired Architectures for Nanoelectronics IEEE International Conference on Intelligent Computing and Information Systems ICICIS'05 Cairo, Egypt, March 5-7, 2005	Plenary
K <sub>4</sub>	V. Beiu: On Biological and Hardware Neural Networks International Joint Meeting of the AMS and SMM Denton, TX, USA, May 21, 1999	Keynote



- K<sub>3</sub> V. Beiu: 2D Neural Hardware vs 3D Biological Ones  
International ICSC Symposium on Neural Computations NC'98  
Vienna, Austria, September 22, 1998 Plenary
- K<sub>2</sub> V. Beiu: Neural Inspired Parallel Computations Require Analog Processors  
International Conference on Parallel Computing and Electrical Engineering PARELEC'98  
Bialystok, Poland, September 4, 1998 Plenary
- K<sub>1</sub> V. Beiu: How to Build VLSI-Efficient Neural Chips  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Spain, February 11, 1998 Keynote

## INVITED TUTORIALS

19

- T<sub>19</sub> V. Beiu: The Race for Mighty AI Chips  
IEEE International Conference: Sciences of Electronic, Technologies of Information and Telecommunications SETIT'22  
Genoa, Italy & Sfax, Tunisia, May 28-30, 2022 (<http://www.setit.rnu.tn/>)
- T<sub>18</sub> V. Beiu: On Brain-Inspired Nano-Architectures  
IEEE International Conference on Computers, Communications and Control ICCCC'18  
Baile Felix, Oradea, Romania, May 08-12, 2018 (<http://univagora.ro/en/icccc2018/keynote/>)
- T<sub>17</sub> V. Beiu, S.R. Cowell, L. Dauş, and P. Poulin: The Brain and the Computer Revisited Once Again  
IEEE International Nanotechnology Conference IEEE-NANO'16  
Sendai, Japan, August 22, 2016  
[http://nano.papercept.net/conferences/conferences/NANO16/program/NANO16\\_ContentListWeb\\_1.html](http://nano.papercept.net/conferences/conferences/NANO16/program/NANO16_ContentListWeb_1.html)
- T<sub>16</sub> V. Beiu, P.M. Kelly, and W. Ibrahim: On Brain Inspired Nano Interconnects  
IEEE International Joint Conference on Neural Networks IJCNN'10 (part of WCCI'10)  
Barcelona, Spain, July 18, 2010  
[https://ieeetv.ieee.org/player/embed\\_play/130009/videowidth](https://ieeetv.ieee.org/player/embed_play/130009/videowidth) & [/130008/videowidth](https://ieeetv.ieee.org/player/embed_play/130008/videowidth)
- T<sub>15</sub> V. Beiu, and P.M. Kelly: On Brain Inspired Interconnects for Nano-electronics  
International ICST Conference on Nano-Networks Nano-Net'09  
Luzern, Switzerland, October 19, 2009
- T<sub>14</sub> V. Beiu, and W. Ibrahim: On Reliability When Down to a Handful of Electrons  
IEEE International Nanotechnology Conference IEEE-NANO'09  
Genoa, Italy, June 27, 2009
- T<sub>13</sub> V. Beiu: On Brain Inspired Low-Power Redundant Designs for Silicon Nano-electronics and Beyond  
IEEE Annual Conference of the Industrial Electronic Society IECON'07  
Taipei, Taiwan, November 5, 2007
- T<sub>12</sub> V. Beiu: On Brain-Inspired Redundant Designs  
IEEE International Conference on Design and Technology of Integrated Systems DTIS'07  
Rabat, Morocco, September 2, 2007
- T<sub>11</sub> V. Beiu, and W. Ibrahim: Dealing with the Reliability Challenge for Semiconductor Nano-electronics and Beyond  
IEEE International Midwest Symposium on Circuits and Systems MWSCAS'07  
Montreal, Canada, August 5, 2007
- T<sub>10</sub> V. Beiu, and W. Ibrahim: Emerging Fault-Tolerant Designs for Novel Nano-Architectures  
IEEE International Conference on Nanotechnology IEEE-NANO'07  
Hong Kong, China, August 2, 2007

- T<sub>9</sub> V. Beiu, J. Nyathi, S. Aunet, and M.H. Sulieman: Femto Joule Switching for Nano Electronics  
IEEE International Conference on Computer Systems and Applications AICCSA'06  
Sharjah, UAE, March 8-11, 2006
- T<sub>8</sub> V. Beiu: Design Challenges for Nanoelectronics  
International Conference on Innovations in Information Technologies IIT'05  
Dubai, UAE, September 26-28, 2005
- T<sub>7</sub> V. Beiu, and S. Roy: Practical Redundant Designs for Nano Architectures – Novel Theoretical Results  
International Symposium on Nano and Giga Challenges in Nanoelectronics NGCM'04  
Krakow, Poland, September 17, 2004
- T<sub>6</sub> V. Beiu, J.M. Quintana, M.J. Avedillo, and P.-S. Wu: Threshold Logic From Vacuum Tubes to Nanoelectronics  
IEEE International Conference on Neural Networks and Signal Processing ICNNSP'03  
Nanjing, China, December 14-17, 2003
- T<sub>5</sub> V. Beiu, J.M. Quintana, and M.J. Avedillo: Threshold Logic – From TTL to Quantum Computing  
IEEE International Joint Conference on Neural Networks IJCNN'03  
Portland, OR, USA, July 20-24, 2003
- T<sub>4</sub> V. Beiu: How to Build VLSI-Efficient Neural Chips  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Canary Islands, Spain, February 9-13, 1998
- T<sub>3</sub> V. Beiu: Kolmogorov's Superpositions and New Mixed Analog/Digital Architectures  
Brazilian Symposium on Neural Networks IV SBRN, Goiania, Brazil, December 4, 1997
- T<sub>2</sub> V. Beiu: Entropy, Constructive Neural Learning, and VLSI Efficiency  
International Workshop on Neural Research Priorities in Data Transmission and EDA NEuroTop'97  
Braşov, Romania, May 27, 1997
- T<sub>1</sub> V. Beiu: Overview of the Present State-of-the-Art of Hardware Implementations of Neural Networks  
Brazilian Symposium on Neural Networks SBRN'96, Recife, Brazil, November 13, 1996

#### INVITED LECTURES/SEMINARS

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- L<sub>52</sub> V. Beiu: Chips (shortages), Technology and Taxes  
International Students Scientific Communications Session SSCS'21, Arad, Romania, June 14, 2021
- L<sub>51</sub> V. Beiu: Quantum AI from the Ground Up  
International Students Conference StudMath-IT'20, Arad, Romania, November 26, 2020
- L<sub>50</sub> V. Beiu: Rise of the AI Chips  
International Students Scientific Communications Session SSCS'20, Arad, Romania, June 27, 2020
- L<sub>47-49</sub> V. Beiu: Bio-Inspired Cellular Nano-Architectures  
– International Students Scientific Communications Session SSCS'19, Arad, Romania, June 14, 2019  
– Mærsk Mc-Kinney Møller Institute, South Denmark University, Odense, Denmark, October 11, 2018  
– International Students Scientific Communications Session SSCS'17, Arad, Romania, June 7, 2017
- L<sub>46</sub> V. Beiu: Deciphering the Low Level Reliability Schemes of the Brain  
Enabled by Abraham de Moivre, Edward F. Moore, and Claude E. Shannon  
Department of Informatics Scientific Seminar, West University of Timisoara, Romania, March 8, 2017
- L<sub>45</sub> V. Beiu: From de Moivre to Moore-Shannon and Beyond  
Reliability Schemes Revealed by Atomic Resolution Microscopy  
Institute of Informatics Scientific Seminar, University of Szeged, Hungary, February 28, 2017
- L<sub>44</sub> V. Beiu: What's All the Fuss About the Brain?  
CIT Graduate Seminar, UAEU, Al Ain, UAE, May 27, 2015

- L<sub>43</sub> V. Beiu: Revealing the Reliability Scheme of the Neurons – One Ion Channel at a Time  
UAEU Cognitive Science Research Series, UAEU, AI Ain, UAE, May 24, 2015
- L<sub>42</sub> V. Beiu: If Biology Can ... Why Can't Silicon? The Brain and the Computer  
TU Dresden, Dresden, Germany, July 11, 2013  
[http://nano.tu-dresden.de/pages/seminar\\_637.html](http://nano.tu-dresden.de/pages/seminar_637.html)
- L<sub>41</sub> V. Beiu: The Brain – A Gentle Introduction Clearing Misconceptions  
TU Dresden, Dresden, Germany, April 11, 2013  
[http://nano.tu-dresden.de/pages/seminar\\_623.html](http://nano.tu-dresden.de/pages/seminar_623.html)
- L<sub>40</sub> V. Beiu: From Ion Channels to Future Nano-Architectures – Beyond von Neumann Cellular Automata  
Chalmers University, Gothenburg, Sweden, November 2, 2012
- L<sub>39</sub> V. Beiu: Bio-inspired Arrays to the Rescue – The Curse of Constant Failure Rates and Gaussian Distributions  
Chalmers University, Gothenburg, Sweden, October 29, 2012
- L<sub>38</sub> V. Beiu: On the Reliability Accuracy Challenge  
University of Ulster, Magee, UK, December 16, 2011
- L<sub>37</sub> V. Beiu: Reliability Prospects for Ultra Low Power Hybrid NEMS-CMOS  
UC Berkeley, Berkeley, CA, November 14, 2011
- L<sub>36</sub> V. Beiu: On Biologically Inspired Processing = Communication + Computation  
University of Ulster, Magee, UK, November 19, 2010
- L<sub>34-35</sub> V. Beiu: Brain Inspired Nano Architectures — Electron Behaving Badly  
– IEEE P/T Colloquium, Los Alamos National Laboratory, Los Alamos, NM, USA, April 15, 2008  
– CIT Distinguished Lecture Series, College of IT, UAEU, AI Ain, UAE, March 13, 2008
- L<sub>33</sub> V. Beiu: On Brain Inspired Low-Power Redundant Designs for Silicon Nano-electronics and Beyond  
Khalifa University of Science, Technology and Research (KUSTAR), Sharjah, UAE, March 3, 2008
- L<sub>32</sub> V. Beiu: Fault Tolerant Brain Inspired Nano Architectures  
CIT Distinguished Lecture Series, College of IT, UAEU, AI Ain, UAE, April 2006
- L<sub>31</sub> V. Beiu: On Brain Inspired Nano Architectures — There Are Plenty of Opportunities at the Top  
University of Ulster, Londonderry, UK, November 25, 2005
- L<sub>30</sub> V. Beiu: Great Challenges of Nanoelectronics — There Are Plenty of Challenges at the Bottom  
University of Ulster, Londonderry, UK, November 23, 2005
- L<sub>29</sub> V. Beiu: Achieving High-Speeds at Ultra Low-Power – Femto Joule Switching Nano Architectures  
Heinz Nixdorf Institute/University of Paderborn, Paderborn, Germany, August 16, 2004
- L<sub>28</sub> V. Beiu: Highly Reliable Designs for Scaled CMOS and Other Nanodevices (SETs, RTDs, Molecular)  
Heinz Nixdorf Institute/University of Paderborn, Paderborn, Germany, August 13, 2004
- L<sub>27</sub> V. Beiu: Review of Nanoelectronic Challenges and Some Plausible Solutions  
University "Politehnica" of Bucharest, Bucharest, Romania, August 9, 2004
- L<sub>26</sub> V. Beiu: On Novel (neural-inspired) Nano Architectures  
Washington State University, Pullman, WA, USA, November 7, 2003
- L<sub>24-25</sub> V. Beiu: Threshold Gates From TTL to Quantum Computing (Part I and Part II)  
– Heinz Nixdorf Institute/University of Paderborn, Paderborn, Germany, July 2, 2003  
– University of Paderborn, Paderborn, Germany, July 3, 2003
- L<sub>23</sub> V. Beiu: Advanced Real-Time-Radiography Graphical Object Selection (ARGOS)  
Washington State University, Pullman, WA, WA, USA, November 6, 2002
- L<sub>22</sub> V. Beiu: On VLSI Neural Computations  
Washington State University, Pullman, WA, USA, October 22, 2001

- L<sub>21</sub> V. Beiu: FastLogic and Its Applications  
Berkeley Wireless Research Center (BWRC), Berkeley, CA, USA, November 13, 2001
- L<sub>20</sub> V. Beiu: Neural Gates – Noise Robust but Fan-in Limited  
University “Politehnica” of Bucharest, Bucharest, Romania, June 4, 2001
- L<sub>19</sub> V. Beiu: Neural Inspired Parallel Computations Require Analog Processors  
Centre National de la Recherche Scientifique (CNRS), Paris, France, September 18, 1998
- L<sub>18</sub> V. Beiu: Introduction to Hardware Implementations of Neural Networks (series of 3 lectures)  
State University of Sao Paulo, Sao Paulo, Brazil, December 8-10, 1997
- L<sub>15-17</sub> V. Beiu: Kolmogorov’s Superpositions, Computer Architectures, and VLSI CAD  
– Dalle Molle Institute for Perceptual AI (IDIAP), Martigny, Switzerland, October 2, 1997  
– Paderborn University, Paderborn, Germany, September 30, 1997  
– Heinz Nixdorf Institute (HNI), Paderborn, Germany, September 29, 1997
- L<sub>14</sub> V. Beiu: 2D Neural Network Hardware vs 3D Biological Ones  
University Paris XII, Paris, France, September 22, 1997
- L<sub>13</sub> V. Beiu: Optimal Synthesis of Neural Circuits Using a Construction for Kolmogorov’s Superpositions  
King’s College London, London, UK, June 13, 1997
- L<sub>12</sub> V. Beiu: On Constructing Size- and VLSI-Optimal Neural Networks  
Royal Holloway University, Egham, UK, June 11, 1997
- L<sub>11</sub> V. Beiu: On Entropy Bounds with Application to Designing Constructive Neural Learning Algorithms  
Oxford University, Oxford, UK, June 9, 1997
- L<sub>10</sub> V. Beiu: Entropy and Efficient Neural Learning  
University “Politehnica” of Bucharest, Bucharest, Romania, June 2, 1997
- L<sub>9</sub> V. Beiu: Hardware Implementation of Neural Networks – A Comprehensive Review  
Los Alamos National Laboratory, Los Alamos, NM, USA, February 7, 1997
- L<sub>8</sub> V. Beiu: Hardware Implementations of Neural Networks – Where Are We, and Where Are We Going?  
Series of lectures, University of Pernambuco, Recife, Brazil, November 15-20, 1996
- L<sub>6-7</sub> V. Beiu: On the Complexity of Area- and Time-Efficient VLSI Implementations of Neural Networks  
– Royal Holloway University, Egham, UK, June 12, 1996  
– “Transilvania” University of Braşov, Braşov, Romania, December 19, 1995
- L<sub>5</sub> V. Beiu: VLSI-Efficient (Neural) Learning  
University “Politehnica” of Bucharest, Bucharest, Romania, May 22, 1995
- L<sub>4</sub> V. Beiu: Hardware Implementations of Neural Networks  
Center for Neural Networks, King’s College London, London, UK, February 9, 1995
- L<sub>3</sub> V. Beiu: On Efficient Neural VLSI Implementations  
University “Politehnica” of Timișoara, Timișoara, Romania, November 21, 1994
- L<sub>2</sub> V. Beiu, and A. Florea: CAD Tools for PCs (series of lectures)  
AVERSA SA, Bucharest, Romania, May-June, 1991
- L<sub>1</sub> V. Beiu, and A. Florea: IBM PC Training (series of lectures)  
Ministry of National Defense, Bucharest, Romania, March - April, 1991

**INVITED PRESENTATIONS TO CONFERENCES/UNIVERSITIES/NATIONAL LABS/ETC.**

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- P<sub>73</sub> R.-M. Beiu, V. Dragoi, and V. Beiu  
3D Hammocks and 2.5D Consecutive – Biology Fine Balancing  
International Workshop on Soft Computing Applications SOFA2020  
Virtual conference, November 27-29, 2020

- P<sub>72</sub> M. Tache, V. Dragoi, and V. Beiu  
When Reliability Gets Nasty – The Devil Is in the Details  
International Workshop on Soft Computing Applications SOFA2020  
Virtual conference, November 27-29, 2020
- P<sub>71</sub> R.-M. Beiu, S. Hoara, and V. Beiu  
And Now This: Hammocks for Quantum and Photonics  
International Workshop on Soft Computing Applications SOFA2020  
Virtual conference, November 27-29, 2020
- P<sub>70</sub> R.-M. Beiu, M. M. Balas, V. E. Balas, and V. Beiu: Seeing Is Believing  
International Conference on Optics, Photonics and Laser Technologies OPTICS & LASER-2019  
San Francisco, CA, USA, June 3-5, 2019
- P<sub>69</sub> F.-D. Munteanu, A. Cavaco-Paulo, M. A. Mernea, and V. Beiu: Studies of Solvated Ions in Confined Spaces  
New Trends on Sensing-Monitoring-Telediagnosis for Life Sciences NT-SMT-LS'17  
Bucharest, Romania, September 7-9, 2017
- P<sub>68</sub> V. Beiu: Photonic Techniques for Brain Imaging  
SPIE International Conference for Lasers in Medicine  
Timisoara, Romania, July 13-15, 2017
- P<sub>67</sub> V. Beiu, and M. Tache: On Threshold Voltage Variation-Tolerant Designs  
International Symposium on Research and Education in Innovation Era ISREIE'16  
Arad, Romania, December 8-10, 2016
- V. Beiu: Elucidating the Low Power of the Brain – Why Ions Really Matter [Canceled]  
CMOS Emerging Technologies Research CMOSETR'16  
Montreal, Canada, May 25-27, 2016
- P<sub>66</sub> V. Beiu, and L. Daus: Deciphering the Reliability Scheme of the Neurons – One Ion Channel at a Time  
International Conference on Bio-inspired Information & Communication Technology BICT'14  
Boston, MA, USA, December 1-3, 2014
- P<sub>65</sub> V. Beiu: Bio-Inspired Designing with Arrays – When Distributions are Non-Gaussian  
CMOS Emerging Technologies Research CMOSETR'14, Grenoble, France, July 6-8, 2014  
<http://books.google.ca/books?id=OL3aAwAAQBAJ&pg=PA102>
- P<sub>64</sub> V. Beiu: What's All the Fuss About the Brain? A Few Large Brain Research Projects  
Cognitive Society Day, UAEU, Al Ain, UAE, May 20, 2014
- P<sub>63</sub> V. Beiu, A. Beg, and W. Ibrahim: Atto-Joule Gates for the Whole Voltage Range  
IEEE International Conference on Nanotechnology IEEE-NANO'11  
Portland, OR, USA, August 15-19, 2011
- P<sub>62</sub> V. Beiu: Quo Vadis Nano Architectures [Why  $U \times I$  Can Be Zero]  
The 3<sup>rd</sup> UAEU Physics Symposium, Al Ain, Abu Dhabi, UAE, May 5, 2011
- P<sub>61</sub> V. Beiu: Ultra Low Power Processing Should Be ... Biologically Inspired  
Masdar Institute of Science and Technology. Abu Dhabi, UAE, January 10, 2011
- P<sub>60</sub> P.M. Kelly, F. Tuffy, V. Beiu, and L.J. McDaid: Reduced Interconnects in Neural  
Networks Using a Time Multiplexed Architecture based on Quantum Devices  
International ICST Conference on Nano-Networks Nano-Net'09  
Luzern, Switzerland, October 18-20, 2009
- P<sub>59</sub> W. Ibrahim, and V. Beiu: A Bayesian-based EDA Tool for Nano-Circuits Reliability Calculations  
International ICST Conference on Nano-Networks Nano-Net'09  
Luzern, Switzerland, October 18-20, 2009

- P<sub>58</sub> V. Beiu, B.A.M. Madappuram, P.M. Kelly, and L.J. McDaid  
On Two-layer Hierarchical Networks: How Does the Brain Do This?  
International ICST Conference on Nano-Networks Nano-Net'09  
Luzern, Switzerland, October 18-20, 2009
- P<sub>57</sub> V. Beiu, W. Ibrahim, and R.Z. Makki: On Wires Holding a Handful of Electrons  
International ICST Conference on Nano-Networks Nano-Net'09  
Luzern, Switzerland, October 18-20, 2009
- P<sub>56</sub> V. Beiu, H. Amer, and M. McGinnity  
On Global Communications for Nano-Architectures: Brain versus Rent's Rule  
IEEE International Conference on Design of Circuits and Integrated Systems DCIS'07  
Seville, Spain, November 21-23, 2007
- P<sub>55</sub> R.M. Beiu, C.D. Stanescu, and V. Beiu: Nanostructured Fiber Optics as Highly Sensitive Mechanical Sensors  
International Trends in NanoTechnology TNT'07, San Sebastian, Spain, September 3-7, 2007
- P<sub>54</sub> V. Beiu: On Brain-inspired Nano-architectures – An Inescapable Device-level Convergence?  
Center on Functional Engineered Nano Architectonics (FENA)  
University of California at Los Angeles (UCLA), Los Angeles, CA, USA, April 27, 2007
- P<sub>53</sub> V. Beiu: A Brain-inspired Perspective on Nano-Communications  
NanoMaterials'07, San Diego, CA, USA, April 23-25, 2007
- P<sub>52</sub> V. Beiu: The Quest for Redundant Computations – When Neural-inspired Will Outperform Classical Architectures  
NSF Workshop on Architectures for Silicon Nanoelectronics and Beyond  
Portland State University, Portland, OR, USA, September 13-14, 2005
- P<sub>51</sub> V. Beiu: From Perceptrons to Neural Inspired Circuits and Nano Architectures  
Advanced Research and Development Agency (ARDA)  
Oak Ridge National Lab, Knoxville, TN, USA, April 11-12, 2005
- P<sub>47-50</sub> V. Beiu: From Neural Inspired Gates and Circuits to Nano Architectures  
– Centre National de la Recherche Scientifique (CNRS), Paris, France, July 2005  
– University of Rochester, Rochester, NY, USA, March 15, 2005  
– Rochester Institute of Technology, Rochester, NY, USA, March 14, 2005  
– Technical University of Graz, Graz, Austria, March 3, 2005
- P<sub>46</sub> V. Beiu: A Novel Highly Reliable Low-Power Nano Architecture – When von Neumann Augments Kolmogorov  
IEEE International Conference on Application-specific Systems, Architectures and Processors ASAP'04  
Galveston, TX, USA, September 27-29, 2004
- P<sub>45</sub> J. Nyathi, V. Beiu, and S. Aunet  
Femto Joule Switching — Review of Low Energy Design Styles for the Nano Era  
International Symposium on Nano and Giga Challenges in Nanoelectronics NGCM'04  
Krakow, Poland, September 13-17, 2004
- P<sub>44</sub> V. Beiu, J.M. Quintana, M.J. Avedillo, and M.H. Sulieman: Threshold Logic – From TTL to Nanoelectronics  
IEEE International Midwest Symposium on Circuit and Systems MWSCAS'03  
Cairo, Egypt, December 27-30, 2003
- P<sub>43</sub> M.H. Sulieman, and V. Beiu: Review of Recent Full Adders Implemented in Single Electron Technology  
IEEE International Midwest Symposium on Circuit and Systems MWSCAS'03  
Cairo, Egypt, December 27-30, 2003
- P<sub>42</sub> S. Roy, V. Beiu, and M.H. Sulieman: Reliability Analysis of Some Nano Architectures  
Neural Information Processing System NIPS'03, Whistler, Canada, December 12-13, 2003
- P<sub>41</sub> J.M. Quintana, M.J. Avedillo, and V. Beiu: Beyond Threshold Logic Gates  
Neural Information Processing System NIPS'03, Whistler, Canada, December 12-13, 2003



- P<sub>40</sub> M.H. Sulieman, and V. Beiu: Characterization of Optimal Practical Adders for SET  
Neural Information Processing System NIPS'03, Whistler, Canada, December 12-13, 2003
- P<sub>39</sub> J. Nyathi, V. Beiu, S. Tatapudi, and D.J. Betowski: Low Power Charge Recycling Asynchronous Designs  
Neural Information Processing System NIPS'03, Whistler, Canada, December 12-13, 2003
- P<sub>38</sub> V. Beiu: Threshold Logic – From the Early Days into the Nanoera  
Neural Information Processing System NIPS'03, Whistler, Canada, December 12-13, 2003
- P<sub>37</sub> V. Beiu: Review of Silicon Nanoelectronics and Beyond  
Neural Information Processing System NIPS'03, Whistler, Canada, December 12-13, 2003
- P<sub>36</sub> V. Beiu: Designing with Perceptrons  
University of Paderborn, Paderborn, Germany, November 10, 2003
- P<sub>35</sub> V. Beiu: Advanced Real-Time-Radiography Graphical Object Selection (ARGOS)  
Washington State University, Pullman, WA, USA, October 11, 2002
- P<sub>34</sub> V. Beiu, H.E. Makaruk, D. Morgan, and L. Popa-Simil  
ARGOS – Advanced RTR Graphical Object Selection  
Los Alamos National Laboratory, Los Alamos, NM, USA, July 24, 2002
- P<sub>23-33</sub> V. Beiu: On VLSI-Optimal Neural Computations  
– University of Hawaii, Honolulu, HI, USA, April 12, 2001  
– Rutgers University, Rutgers, NJ, USA, April 9, 2001  
– Boston University, Boston, MA, USA, April 6, 2001  
– University of Texas at Arlington, Arlington, TX, USA, April 2, 2001  
– Rochester Institute of Technology, Rochester, NY, USA, March 22, 2001  
– California Polytechnic State University, San Luis Obispo, CA, USA, March 19, 2001  
– University of Wisconsin Milwaukee, Milwaukee, WI, USA, March 9, 2001  
– University of California at Riverside, Riverside, CA, USA, March 2, 2001  
– Illinois Institute of Technology, Chicago, IL, USA, February 23, 2001  
– Washington State University, Pullman, WA, USA, February 9, 2001  
– Metroplex Institute for Neural Dynamics (MIND), Dallas, TX, USA, November 4, 2000
- P<sub>22</sub> V. Beiu: On Biological and Hardware Neural Networks  
International Joint Meeting AMS-SMM, Denton, TX, USA, May 19-22, 1999
- P<sub>21</sub> V. Beiu: A Novel Microsatellite Control System  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Canary Islands, Spain, February 9-13, 1998
- P<sub>20</sub> V. Beiu: A Space-Based Radio Frequency Transient Event Classifier  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Canary Islands, Spain, February 9-13, 1998
- P<sub>19</sub> V. Beiu: On VLSI-Optimal Constructive Algorithms for Classification Problems  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Canary Islands, Spain, February 9-13, 1998
- P<sub>18</sub> V. Beiu: Time-Space Trade-Offs in Parallel and Neural Computing  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Canary Islands, Spain, February 9-13, 1998
- P<sub>17</sub> V. Beiu, and H.E. Makaruk: Deeper and Sparser Nets Are Optimal  
International ICSC Symposium on Engineering of Intelligent Systems EIS'98  
Tenerife, Canary Islands, Spain, February 9-13, 1998

- P<sub>16</sub> R. Andonie, and V. Beiu: Optimization of Circuits Using Neural Networks  
Workshop on Shaping the Hardware Solutions for the Third Millennium ANITA'96  
Uppsala, Sweden, December 9-10, 1996
- P<sub>15</sub> V. Beiu: VLSI Complexity of Threshold Gate COMPARISON  
International Symposium on Neuro-Fuzzy Systems AT'96  
Lausanne, Switzerland, August 29-31, 1996
- P<sub>14</sub> V. Beiu, and J.G. Taylor: Area-Efficient Constructive Learning Algorithm  
International Conference on Control System and Computer Science CSCS-10  
Bucharest, Romania, May 25, 1995
- P<sub>13</sub> V. Beiu: Optimal VLSI Implementations of Neural Networks – VLSI-Friendly Learning Algorithms  
Applied Decision Technologies Conference ADT'95, London, UK, April 3-5, 1995
- P<sub>12</sub> V. Beiu, J.A. Peperstraete, J. Vandewalle, and R. Lauwereins: Addition Using Constrained Threshold Gates  
International Conference on Technical Informatics ConTI'94  
Timișoara, Romania, November 16-19, 1994
- P<sub>11</sub> V. Beiu, J.A. Peperstraete, J. Vandewalle, and R. Lauwereins  
Digital Implementations of Neural Networks Using Threshold Gates  
International Conference Romania and Romanians in Contemporary Science RRCS'94  
Sinaia, Romania, May 24-27, 1994
- P<sub>10</sub> V. Beiu, J.A. Peperstraete, J. Vandewalle, and R. Lauwereins  
VLSI Complexity Reduction by Piece-Wise Approximation of the Sigmoid Function  
European Symposium on Artificial Neural Networks ESANN'94, Brussels, Belgium, April 20-22, 1994
- P<sub>9</sub> V. Beiu, J.A. Peperstraete, J. Vandewalle, and R. Lauwereins  
Learning from Examples and VLSI Implementation of Neural Networks  
European Meeting on Cybernetics and System Research EMCSR'94, Vienna, Austria, April 5-8, 1994
- P<sub>8</sub> V. Beiu: J.A. Peperstraete, J. Vandewalle, and R. Lauwereins  
Close Approximations of Sigmoid Functions by Sum of Steps  
Romanian Symposium on Computer Science ROSYCS'93, Iași, Romania, November 12-13, 1993
- P<sub>7</sub> V. Beiu, J.A. Peperstraete, J. Vandewalle, and R. Lauwereins  
Overview of Some Efficient Threshold Gate Decomposition Algorithms  
International Conference on Control System and Computer Science CSCS-9  
Bucharest, Romania, May 25-28, 1993
- P<sub>6</sub> V. Beiu, J.A. Peperstraete, and R. Lauwereins: Enhanced Threshold Gate Fan-in Reduction Algorithm  
Interdisciplinary Centrum for Neural Networks ICNN'92, Leuven, Belgium, November 19, 1992
- P<sub>5</sub> V. Beiu: D. C. Ioan, M. Dumbrava, and O. Robciuc  
Physical Fields Determination Using Continuous Boltzmann Machines  
Symposium on Parallel Computing SPC'91, Bucharest, Romania, December 10-11, 1991
- P<sub>4</sub> V. Beiu: Neural Network Priority Queue  
International Workshop on Parallel Processing by Cellular Automata PARCELLA'90  
Berlin, Germany, September 19-21, 1990
- P<sub>3</sub> V. Beiu: From Systolic Arrays to Neural Networks  
International Symposium on Informatics INFO-IASI'89, Iași, Romania, October 19-21, 1989
- P<sub>2</sub> V. Beiu: Memory Structure with Simultaneous Read and Write Capabilities  
Conference of the Military Academy of Sciences, Bucharest, Romania, November 17-19, 1982
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– Synplicity, September 26, 2003  
– AMD, September 26, 2003  
– Agilent Labs, September 25, 2003  
– Infineon, September 25, 2003  
– SUN Microsystems, September 25, 2003
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Stevenson, Washington, USA), July 10, 2002
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– Q’Bit Systems SRL, Bucharest, Romania, October 24, 2000  
– ESSEX Com SRL, Bucharest, Romania, October 23, 2000  
– Utimaco, Brussels, Belgium, May 26, 2000  
– ST Microelectronics, San Diego, CA, USA, September 29, 1999  
– ST Microelectronics, Carrollton, TX, USA, August 20, 1999  
– Texas Instruments, Dallas, TX, USA, August 16, 1999  
– Sipex, Milpitas, CA, USA, August 13, 1999  
– ST Microelectronics, San Jose, CA, USA, August 13, 1999  
– ST Microelectronics, San Jose, CA, USA, April 16, 1999  
– National Semiconductors, Santa Clara, CA, USA, April 16, 1999  
– Alcatel, Bruxelles, Belgium, April 14, 1999  
– Texas Instruments, Dallas, TX, USA, April 1, 1999  
– Texas Instruments, Houston, TX, USA, March 25, 1999  
– Metaflow, La Jolla, CA, USA, February 18, 1999  
– Texas Instruments, Houston, TX, USA, September 21, 1998