

Europass Curriculum Vitae

Personal information



Surname(s) / First name(s) **Ioan Constantiu Daniel**

Address Ariesul Mare Nr3, BI I10, Sc C, Ap 45, 060791 Bucharest (Romania)

Telephone(s) (+4)0213510464 Mobile | (+4)0721296290

Fax(es) (+4)0213118004

E-mail(s) Daniel.ioan@upb.ro

Nationality Romanian

Date of birth 01 January 1948

Gender Male

Work experience

Dates	01/09/1994 →
Occupation or position held	Professor
Main activities and responsibilities	In Electrical Engineering Dpt./Fac. Teaching Theoretical Background of Electrical Engineering (Electromagnetic field and Electric Circuits) at Faculties of EE; Automatic control and computers in Polytechnic University of Bucharest. Supervision of PhD in Electrical Engineering. Research in Computational Electromagnetism. Director of CIEAC (Research Center in Computer Aided Electrical Engineering).
Name and address of employer	Universitatea Politehnica Bucuresti Spl Independentei 313, 060042 Bucharest (Romania)
Type of business or sector	Higher education and research
Dates	01/09/1990 - 01/09/1994
Occupation or position held	Associate professor (Conf.)
Main activities and responsibilities	In Electrical Engineering Dpt./Fac. Teaching: Electrical Engineering, Numerical Methods and Electromagnetic Modeling. Research in Computer Aided Education of Electrical Engineers. Head of the Postgraduate School of Computer Aided Electrical Engineering.
Name and address of employer	Universitatea Politehnica Bucuresti Spl Independentei 313, 060042 Bucharest (Romania)
Type of business or sector	Higher education and research
Dates	01/09/1979 - 01/09/1990
Occupation or position held	Lecturer (s.l.)
Main activities and responsibilities	In Electrical Engineering Dpt./Fac. Teaching courses and applications: Electrical Engineering, Numerical Methods. Head of LMN (Laboratorul de Metode Numerice). Research in Computer Aided Electrical Engineering.
Name and address of employer	Institutul Politehnic Bucuresti Spl Independentei 313, 060042 Bucharest (Romania)
Type of business or sector	Higher education and research
Dates	01 September 1970 - 01 September 1979
Occupation or position held	Teaching assistant and PhD Student
Main activities and responsibilities	In Electrical Engineering Dpt./Fac. Assistant of professors Remus Radulet and C. I. Mocanu. Teaching applications (seminars and laboratory) in Theoretical Background of Electrical Engineering

(Electromagnetic field and Electric circuits). Research in the area of transient electromagnetic field in nonlinear media.

Name and address of employer Institutul Politehnic Bucuresti
Spl Independentei 313, 060042 Bucharest (Romania)
Type of business or sector Higher education and research

Education and training

Dates 01/04/1971 - 01/09/1978
Title of qualification awarded PhD
Principal subjects / occupational skills covered Advanced training and research in Theoretical background of Electrical Engineering and its applications. Title of PhD thesis: Transient Electromagnetic Field in Non-linear Media - Systemic Approach and Equivalent Schemes - supervisor Prof. C. I. Mocanu - El. Eng. Dpt. Scientific contributions in Model Order Reduction of Electromagnetic Nonlinear Devices.
Name and type of organisation providing education and training Institutul Poitehnic Bucuresti (Technical university)
Spl Independentei 313, 060042 Bucharest (Romania)
Level in national or international classification ISCED 6
Dates 01 September 1965 - 01 July 1970
Title of qualification awarded MSc
Principal subjects / occupational skills covered Electrical engineering: design and maintenance of electrical machines, electrical devices, automatic control, electric measurements, power electronics, electro-mechanical and power installations. Scientific programming.
Name and type of organisation providing education and training Institutul Poliethnic Bucuresti, Fac. Electrotehnica (Technical University)
Spl Independentei 313, 060042 Bucharest (Romania)
Level in national or international classification ISCED 5
Dates 15 September 1960 - 01 July 1965
Title of qualification awarded Bacalaureat
Principal subjects / occupational skills covered General education: Mathematics, Physics, Romanian language and literature, History, Geography, Philosophy, Russian language, German language, Latin language.
Name and type of organisation providing education and training Liceul Nicolae Balcescu (Colegiu National)
B-dul Alexandru Ioan Cuza Nr. 182, 810125 Braila (Romania)
Level in national or international classification ISCED 4

Personal skills and competences

Mother tongue(s) **Romanian**

Other language(s)

Self-assessment
European level ()*

English

French

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
C2	Proficient user	C2	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user
C2	Proficient user	C1	Proficient user	B2	Independent user	B1	Independent user	B1	Independent user

(*) [Common European Framework of Reference \(CEF\) level](#)

Social skills and competences

Team spirit and vision at highest international level. Prof. Ioan is an independent and personal thinker. His NGO activity, as a member in:

- National Board of Soros Foundation for an Open Society (1994-97);
- Co-founder of TEMPUS fellows associations - Clubul TEMPUS 2000 (1993);
- IEEE member since 1978;
- Chairman of IEEE Romania Section (1997-98);
- Co-founder of International Compumag Society (1999);
- Co-founder of "Solidaritatea Universitara" (1990) and of AAP - Politehnica Alumni Association (elected as a Chairman).

www.ad-astra.ro/daniel.ioan@pub.ro

Active involvement in Bucharest student movement - December 1968 and in Romanian Revolution - December 1989.

Organisational skills and competences

Management of scientific projects and research/training teams:

- Founder of LMN (Numerical Methods Lab. in 1984);
- Initiator of Postgraduate School in Computer Aided Electrical Engineering PSCAEE (1992);
- Fonder of CIEAC - Research Center for Computer Aided Electrical Engineering (in 1995);
- Creator of first Marie Curie Doctoral School in Romania (in 2005).

Prof. Daniel Ioan was initiator and coordinator of a series of international research/training projects (having total budget > 3Mill EUR):

- TEMPUS JEP/JEN 2717 - project coordinator: 1991 – 1995
- TEMPUS JEP 2912 - project contractor: 1995-1998
- FP5/Copernicus/Manodet - PUB team coordinator: 1997-2000
- JSAEM/ENDE - PUB team coordinator: 1998-2002
- WB/CNCSU/BCUM/CoLaborator - project co-initiator, 1998-2000,
- FP5/IST/Codestar - PUB team coordinator: 2002 – 2004
- FP6/IST/Chameleon RF - PUB team coordinator: 2005 – 2008
- FP6/EST/EST3 - project initiator and coordinator: 2005 – 2009
- FP6/RTN/COMSON - PUB team coordinator: 2005 – 2009
- FP6/ToK/4nEDA - project initiator and coordinator: 2006 – 2010
- FP6/NMP/Artic - PUB team coordinator: 2006 – 2010

He was deeply involved in the life of international scientific community, as an organizer of a series of international conferences and events:

- Computer Aided Engineering Education - CAEE '93 - Bucharest;
- First Romanian-Japan Joint Seminar in Applied Electromagnetism and Mechanics - RJSAEM '96 - Neptun;
- First Romanian-Japan-Romanian Joint Seminar in Applied Electromagnetism and Mechanics - JRSAEM '98 - Gunma University - Japan;
- Scientific Computing in Electrical Engineering - SCEE 06 Sinaia,

and as a member in scientific committees or reviewer:

- ISEM '95 - Cardiff;
- CAEE '97 - Cracovia;
- ENDE '97 - Reggio Calabria;
- ENDE '98 - Paris;
- CAEE '95 - Bratislava;
- ISEM '99 - Pavia;

ENDE '99 - Iowa State University;
ISEM '02 Tokyo;
SCEE 04 Capo d'Orlando;
DATE 05 - Paris.

In these projects were involved the most important European companies in the semiconductor industry, namely Philips, Infineon, ST Microelectronics, IMEC, AustriaMicrosystems, as well as top European personalities working in the EM Modeling and EDA - TCAD domain, for instance: Alain Bossavit, Kurt Richter, G. Rubinacci, J. Tegopoulos, T. Weiland, K. Miya, D. Rodger, Miguel Silveira, Daniel De Zutter, Nick van der Meijs, Wil Schielders or Marcello Anile with whom the project leader collaborated in research activity and joint publications.

Technical skills and competences

The most important contributions of prof. Daniel Ioan are related to the following research topics:

- 1) the development of new modeling methods, including the numerical simulation and optimization of electromagnetic and electronic devices and systems (numerical methods for the computation of the electromagnetic field, at low and high frequencies, in linear or non-linear materials, model extraction for passive components from VLSI of very high frequencies, model order reduction, computer simulation of field-circuit coupled problems, developing of new soft computing techniques, such as ANN, original genetic, evolutionary or other biology inspired algorithms for optimization and inverse problems);
- 2) numerical methods and high performance scientific computing (including parallel and distributed algorithms) applied to electrical engineering in a broad sense (electronics, power and control engineering) and multi-physics coupled problems,
- 3) advanced applications in nano- Electronic Design Automation, TCAD, micro-electro-mechanical devices, Lab on a chip, micro-fluid magnetic actuation etc.;
- 4) methods for electromagnetic non-destructive testing (specialized magnetic field sensors, circuits for signal processing, including design of dedicated VLSI circuits);
- 5) computer aided electrical engineering education, especially in the field of numerical methods and symbolic analysis.

The four most creative scientific discoveries and results are related to:

- model order reduction methods, applied to nonlinear elements with distributed parameters;
- dFIT – dual Finite Integrals Technique – an original numerical method to solve elliptic PDE in an efficient way with accuracy control;
- an original optimization method based on "swarm particles", applied for the first time in computation electromagnetism (article in which this method is described is cited > 100 times).
- magnetic hooks – use of special boundary conditions for electromagnetic field equations, in order to model the interaction of VLSI circuit elements with their noisy EM environment, as well as in the efficient hierarchical modeling of the Si substrate.

As a consequence to the publications in the areas above, Prof. Daniel Ioan gained an excellent visibility in the international COMPUMAG community, which comprises researchers working in Computational Electromagnetism, as well as in the communities of SCEE (Scientific Computations in Electrical Engineering) and ENDE (Electromagnetic Non-destructive Evaluation). The most prestigious journals in which his publications can be found are: IEEE Transactions on Magnetics edited in SUA, the British journal COMPEL, the series Mathematics in Industry of the German editor Springer, the Japanese journal JSAEM, as well as the invited presentations at top international events (COMPUMAG since 1978, IEEE CEFC, SCEE, ENDE, ISEF).

The scientific results of project leader and his research team in the areas of Computational Electromagnetism, Modeling of Integrated Circuits and High Performance Computing Techniques for nano-Electronic Design Automation are published in prestigious journals such as IEEE Transaction on Magnetics, Physical Review, COMPEL and International Journal of Applied Electromagnetics and Mechanics as well as in a series of books edited by Springer (e.g. G. Ciuprina, D. Ioan, Scientific computing in electrical engineering, Springer-Verlag, 2007). The main research activity and the recognition of the results is described above, as well as by the following selected list of publications and invited talks:

1. Invited speaker at Workshop „Model Order Reduction, Coupled Problems and Optimization”, held at the Lorentz Center, The Netherlands, from 19 to 23 Sept. 2005.
<http://www.lorentzcenter.nl/lc/web/2005/160/info.php3?wsid=160>

2. Invited speaker at Technical Univ. Eindhoven, CASA - Colloquium - Use of Dual Finite Integration Technique (dFIT) for accuracy control of electromagnetic field numerical computation, Wednesday April 23, 2003
<http://www.win.tue.nl/casa/meetings/colloquium/previous/abstract030423.html>
3. Invited speaker at the Scientific Computing in Electrical Engineering Conference (SCEE) 2008, Espoo, Finland. <http://radio.tkk.fi/en/conferences/scee2008/>
4. Editor of a book published in the Springer book series – Mathematics in Industry, vol 11 (<http://www.springer.com/math/cse/book/978-3-540-71979-3>)
5. Between 1995 and 2000 he acted as a member of Editorial Board of „European Journal of Engineering Education” and „International Journal on Applied Electromagnetics and Mechanics”, and for the series of books „Electromagnetic Nondistructive Evaluation” – IOS Press. He acted also as reviewer for IEEE Transaction on Magnetics and IEEE Transaction on Computer Aided Design of VLSI.
6. Invited presentations - talks to teaching and research staff in several Romanian universities: Iasi (1995), TU Cluj-Napoca (2007) as well as foreign universities: CALTECH (1999), Iowa State Mellon University (1999), Carnegie Mellon University (1999), T.U. Graz (1992), T.U. Budapest (2000), London University (1993), Bath University (1992), U. Geneva (1992), EPFL (1994), University of Tokyo (1996), TU Darmstadt (2005), Leuven University (2000), TU Eindhoven (2008), TU Delft (2008), Univ. Groningen (2010).

Sciento-metrics indicators:

Number of publications: 13 books; 39 book chapters; 34 ISI articles; 23 ISI Proceedings; over 70 papers indexed in the INSPEC database, 18 articles in IEEE Xplore Magazines, 15 in the IEEE Xplore Conference Publications and 182 papers in other journals and conference volumes.

According to ISI - Web of Science, the Hirsch index of prof. Daniel Ioan is = 7;

Total number of citations = 209.

$I_1 = 5.92 > 4$; $P = 7.91 > 2$; $C = 34.4 > 5$; Acc. MECTS nr. 4478/23 June 2011.

$V = I_1 * P * C = 1608 > 4 * 2 * 5 = 40$ which is 40 times bigger than habilitation standard!

The address of the researcherid.com profile: <http://www.researcherid.com/rid/C-4338-2011>

Computer skills and competences

Unix and MS Windows O.S. and tools, scientific programming, HPC, numerical methods, computational electromagnetism, coordination of software production and prototyping teams (FAP, LOCAP, Chamy, ROM WorkBench), design and implementation (in Fortran, C, C++, MATLAB, MAPLE) of advanced software tools for electronic designers. Prof. Daniel Ioan was one of active promoters of advanced Unix/Linux software tools, such as Latex in science and engineering. He is a proficient user of programs such as SPICE and COMSOL.

Conception of advance original scientific algorithms such as particle swarm optimization, dual Finite Integrals Techniques (dFIT), ALROM - All Levels Reduced Order Models, domain decomposition with "magnetic hooks" or extraction of reduced order parametric models by adaptive frequency sampling on multi-CPU systems and many others. He was a member of the IT team of the IEC Thesaurus Concepts in Electricity.

Prof. Daniel Ioan is an author and co-author of books, chapters, articles and communications in scientific computing and electromagnetic modeling. He was an initiator of two projects in High Performance Computers in Polytechnic University of Bucharest: CoLaborator and ToK4nEDA-ATLAS as well as the designer of the first Hybrid Unix Cluster in our university.

Artistic skills and competences

Modern and contemporary visual art connoisseur.

Hi is the initiator of cultural project:

<http://autoreprezentari.blogspot.com/>

Other skills and competences

Teaching activity - Lectures:

Fundamentals of Electrical Engineering (Field theory, Circuit theory, Applied Electromagnetics and Electronics, Numerical methods, Computer Aided Modeling of Electromagnetic Devices), at various faculties from UPB (Electrical engineering, Electronics, Power engineering, Control science, Material Science and Technology, Chemistry). He have been invited to give lectures at several prestigious

national and international universities.

Modern communication with students:

<http://bazele-electrotehnicii.blogspot.com/>

He is involved at the level of undergraduate education and

in graduate higher education: MSc and PhD as well as in post-doc tutoring.

He has a personal, independent vision regarding higher education in Electrical Engineering

http://www.lmn.pub.ro/~daniel/decl_prin.pdf

and research in that area.

Driving licence(s)

B

Additional information

Recognitions: Prof. Daniel Ioan was a member of commission of doctorate candidate at TU Darmstadt.

He was awarded with "Gh. Cartianu" Prize of the Romanian Academy for Information Science and Technology (2000).

Prof. Daniel Ioan received IEEE The Third Millennium Medal "for outstanding merits in Electrical and Electronic engineering".

He has nominated in "Who's Who in the World" ed. XIII (1994) and he received from the Romanian Ministry of Education in 2006 the distinction for the best achievements in European projects.

Annexes

The most important scientific publications from 2002-2012 period and their abstracts.

1. Ciuprina, G; Ioan, D; Munteanu, I, Use of intelligent-particle swarm optimization in electromagnetics, IEEE Transactions on Magnetics Vol. 38, Pages: 1037-1040, 2002. Project leader is not the first author, Article in the project's field, Times Cited: 86 DOI 10.1109/20.996266

Abstract: The paper describes a new stochastic heuristic algorithm for global optimization. The new optimization algorithm, called intelligent-particle swarm optimization (IPSO), offers more intelligence to particles by using concepts such as: group experiences, unpleasant memories (taboo to be avoided), local landscape models based on virtual neighbors, and mimetic replication of successful behavior parameters. The new individual complexity is amplified at the group level and consequently generates a more efficient optimization procedure. A simplified version of the IPSO algorithm was implemented and compared with the classical PSO algorithm for a simple test function and for the Loney's solenoid.

2. Ioan, D.; Ciuprina, G.; Radulescu, M.; Seebacher, E.; Compact modeling and fast simulation of on-chip interconnect lines, IEEE Trans. on Magnetics Vol. 42 Issue: 4 Pages: 547-550, 2006, Project leader is the first author, Article is in the project's field, Times Cited: 10 DOI 10.1109/TMAG.2006.871466

Abstract: An efficient methodology to extract compact models for microstrip lines on lossy silicon substrate is presented. The transversal magnetic field equations are solved by dual finite integration technique (dFIT), a numerical method which allows the accuracy control of the computed frequency dependent line parameters. Several techniques are used to accelerate the process of p.u.l. parameters extraction, such as minimal virtual boundary, minimal mesh and minimal frequency samples set. The solution of the transmission line equations with frequency dependent parameters is then approximated by a rational function of appropriate degree in order to extract the compact model and its SPICE equivalent circuit. The behaviour of the obtained compact model of order 10 shows good agreement with respect to the measured data.

3. S. N. Khaderi, M. G. H. M. Baltussen, P. D. Anderson, D. Ioan, J. M. J. den Toonder, and P. R. Onck, Nature-inspired microfluidic propulsion using magnetic actuation, Physical Review E Volume: 79 Issue: 4, 2009, Project leader is not the first author, Article in the project's field, Times Cited: 7, DOI: 10.1103/PhysRevE.79.046304

Abstract: In this work we mimic the efficient propulsion mechanism of natural cilia by magnetically actuating thin films in a cyclic but non-reciprocating manner. By simultaneously solving the elastodynamic, magnetostatic, and fluid mechanics equations, we show that the amount of fluid propelled is proportional to the area swept by the cilia. By using the intricate interplay between film magnetization and applied field we are able to generate a pronounced asymmetry and associated flow. We delineate the functional response of the system in terms of three dimensionless parameters that capture the relative contribution of elastic, inertial, viscous, and magnetic forces.

4. Daniel Ioan, Wil Schilders, Gabriela Ciuprina, Nick van der Meijs, Wim Schoenmaker, Models for integrated components coupled with their EM environment, COMPEL: The International Journal for

Computation and Mathematics in Electrical and Electronic Engineering, Vol. 27 Iss: 4, pp.820 – 829, 2008, Project leader is the first author, Article in the project's field, Times Cited: 4, DOI: 10.1108/03321640810878225

Abstract: The main aim of this study is the modeling of the interaction of on-chip components with their electromagnetic environment. The integrated circuit is decomposed in passive and active components interconnected by means of terminals and connectors which represent intentional and parasitic couplings of a capacitive and inductive nature. Reduced order models are extracted. The paper shows that one of the main theoretical problems encountered in the modeling of RF components is the difficulty to define a unique terminal voltage, independent of the integration path (this independence being a condition to allow the connection of the component in an electric circuit, where the voltage does not depend of the path shape). The concept of an electromagnetic circuit element that allows the interconnection between IC models is proposed as a solution for this drawback. The system is described either with EM field models, or by electric/magnetic circuits. By using the new concept of hooks, the EM interaction is described effectively with a reduced number of quantities. Since hooks have a virtual character, their identification is the result of an optimization procedure. By increasing their number the model accuracy is improved as also is the computational effort. The optimal automatic identification of hooks is formulated. Practical implications: The modeling of IC components with hooks is part of a new methodology that takes a layout description of typical RF functional blocks that will operate at RF frequencies up to 60GHz and transform them into sufficiently accurate, reliable electrical simulation models, taking EM coupling and variability into account. This will decrease extra design iterations, over-dimensioning or complete failures in the design cycle of RF-IC. Originality/value – For the first time, the concept of magnetic terminals is used to describe interactions in RF integrated circuits. These EM “hooks” are defined in mathematical terms, as proper boundary conditions. The concept of hooks is also new. The proposed modeling methodology for EM coupling is also new. The paper is useful for nEDA designers.

5. Daniel Ioan and Gabriela Ciuprina Reduced Order Models of On-Chip Passive Components and Interconnects, Workbench and Test Structures in MODEL ORDER REDUCTION: THEORY, RESEARCH ASPECTS AND APPLICATIONS, Mathematics in Industry, Volume 13, III, 447-467, Springer 2008, Project leader is the first author, Article in the project's field, DOI: 10.1007/978-3-540-78841-6_20

6. Gabriela Ciuprina, Daniel Ioan and Diana Mihalache Reduced Order Electromagnetic Models for On-Chip Passives Based on Dual Finite Integrals Technique SCIENTIFIC COMPUTING IN ELECTRICAL ENGINEERING Mathematics in Industry, (Ed. G. Ciuprina, D. Ioan), Volume 11, Part III, 287-294, Springer 2007, Project leader is not the first author, Article in the project's field, DOI: 10.1007/978-3-540-71980-930

Abstract An efficient methodology to extract reduced order models for electromagnetic devices is presented. To solve field-circuits coupled problems, the electromagnetic field equations are discretized by the dual Finite Integration Technique (dFIT), a numerical method which allows the accuracy control of the extracted parameters. Several techniques are used to accelerate the extraction process, such as minimal virtual boundary, minimal mesh and minimal frequency samples set. The frequency characteristic of the device is then approximated by a rational function of appropriate degree in order to extract the reduced order model and its SPICE equivalent circuit. The behavior of the synthesized model extracted with proposed algorithm, in the case of passive on-chip devices placed on silicon substrate shows good agreement with respect to the measurements.

7. Ioan, D; Rebian, M, Numerical model for eddy-current testing of ferromagnetic steel parts, IEEE Transactions on Magnetics, 38(2), pp. 629-632, 2002, Project leader is the first author, Article in the project's field, Times Cited: 2.

8. Ioan, D.; Ciuprina, G.; Schilders, WMA, Parametric models based on the adjoint field technique for RF passive integrated components, IEEE Transaction on Magnetics, vol 44, pag. 1658-1661, 2008, Project leader is the first author, Article in the project's field, Times Cited: 3.

Abstract: Taking into consideration the variability specific to the nowadays nanotechnologies, the fast extraction of parametric models is a must for the present VLSI and radio-frequency (RF)-integrated-circuit (IC) design environments. The major contribution of the paper is a new, effective methodology for the extraction of parametric compact models for passive RF integrated components with field effects, valid for high-frequency broad range. The proposed numeric method is systematically based on a dual approach, which provides two complementary approximations of the exact solution. Duality is applied both to the spaces where the discrete solution is found as well as to the open boundary conditions. The adjoint field technique is applied in an original manner to the finite-integral techniques to handle the parameter variability of the extracted model. The new method needs much less computing resources for modeling than other numerical methods.

|