Curriculum vitae

PERSONAL INFORMATION

IOAN MARIUS PURCAR

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WORK EXPERIENCE

2022- Present

Professor

Technical University of Cluj-Napoca, Electrical Engineering Faculty, Electrotechnics and Measurements Department, Gh. Barițiu 26-28, Cluj-Napoca (Romania)

Teaching activities: - courses: CAD tools, Modern CAD / CAE / CAM design techniques and tools, Electrical Circuits Theory, Advanced Programing Languages for Electrical Engineering

Research activities: - Optimal Design of Electromagnetic Devices, Electromagnetic Field Interferences, Numerical Simulation and Optimization of Manufacturing Technologies based on Electrochemical Processes.

Tipul sau sectorul de activitate - Învățământ superior

2012–2022

Associate Professor

Technical University of Cluj-Napoca, Electrical Engineering Faculty, Electrotechnics and Measurements Department, Gh. Barițiu 26-28, Cluj-Napoca (Romania)

Teaching activities: - courses: CAD tools, Modern CAD / CAE / CAM design techniques and tools, Numerical Modeling of Electromagnetic Field, Numerical Modeling of Electrical Circuits, Applied Electrotechnics

Research activities: - Optimal Design of Electromagnetic Devices, Electromagnetic Field Interferences, Numerical Simulation and Optimization of Manufacturing Technologies based on Electrochemical Processes.

2008–2012

Lecturer

Technical University of Cluj-Napoca, Faculty of Electrical Engineering, Dep. of Electrotechnical and Electrical Measurements, Gh. Barițiu 26-28, Cluj-Napoca (Romania)

Teaching and scientific research activities (Courses, laboratory work, seminars, coordination of diploma and / or dissertation projects)

2005–2009

Project Engineer

ELSYCA NV, Vaartdijk 3/603, B-3018 Wigmaal (Leuven), Belgium www.elsyca.com (Belgium)

Research, consulting and training in Electrochemical Engineering

Research in electrochemical engineering (co-author of the commercial software package ECMMaster for 3D modeling of EDM processes)

Trainer for CAD/ CAE/CAM software tools applied in the numerical modeling of electrochemical process.

2001–2005

Researcher, PhD student

Faculty of Engineering, Department of Electrical Engineering (IR-ETEC Dienst), Pleinlaan

2, Vrije Universiteit Brussel, 1050 Bruxelles, Belgia, http://etecmc10.vub.ac.be/, Bruxelles (Belgium)

Research activities in international projects: 1) Development and evaluation of industrial electrochemical reactors (DESINER) 2001-2003; FP5 BRPR-CT98-0800, 2) Super precision electrochemical machining technology including recycling of useful materials (SPECTRUM); 2001-2004; FP5 G1RD-CT-2000-00421, 3) Flemish-Romanian bilateral project BIL/174B0697, 4) Flemish-Romanian bilateral project BSTC–BIL 37/00

1997–2001

Teaching assistant

Technical University of Cluj-Napoca, Faculty of Electrical Engineering, Dep. of Electrotechnical and Electrical Measurements, Gh. Barițiu 26-28, Cluj-Napoca (Romania)

Teaching and research activities (laboratory work, seminars, coordinate bachelor degree and/ or dissertation thesis)

EDUCATION AND TRAINING

2001–2005

PhD in Electrical Engineering

Faculty of Engineering, Department of Electrical Engineering (IR-ETEC Dienst), Pleinlaan 2, Vrije Universiteit Brussel, 1050 Bruxelles, Belgia, Bruxelles (Belgium)

The title of the doctoral thesis: Development and Evaluation of Numerical Models and Methods for Electrochemical Machining and Electrodeposition Applications

1995–1996

Master’s degree in computer aided design in electrical engineering

Technical University of Cluj-Napoca, Cluj-Napoca (Romania)

Analysis of electromagnetic fields with the network method and PSPICE simulation environment

1990–1995

Bachelor's degree

Technical University of Cluj-Napoca, Cluj-Napoca (Romania)

Numerical Analysis of Electromagnetic Fields with the Network Method. 3D Electromagnetic Filed representation

PERSONAL SKILLS

Native language: Romanian

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Dutch	B2	B2	B1	A2	A2
French	B2	B2	B1	A2	A2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

Communication skills

Good communication competences due to: (i) given lectures in national and international scientific conferences, (ii) international research experience from multidisciplinary and multinational research teams, (iii) teaching and leading activities of students.

Organizational / managerial skills

Extensive scheduling abilities, defining the objectives, goals and the priorities during projects, achieved form the following activities: (i) research activity performed during the international research projects, (ii) leading of research teams, (iii) teaching and leading activities of students.

Digital skills

Computer programming and programming languages: C/C++, Fotran, Visual Basic

Advanced programming languages: MATLAB

CAD design software: SolidWorks, CATIA, PTC-CREO și AutoCAD

Multiphysics processes simulation in Ansys Multiphysics (Fluent, CFX and Electronics Desktop) and COMSOL Multiphysics

Development and validation of numerical analysis techniques for electro-chemical electrodes shape evolution; Optimal design by numerical simulation of electromagnetic devices; Numerical simulation of electromagnetic field interferences; Numerical simulation of electro-thermo-mechanical processes in power integrated circuits.

Other skills

Reviewer: IET Science, Measurement & Technology, Electric Power Systems Research, International Journal of Computer Mathematics, International Communications in Heat and Mass Transfer, Journal of Materials Processing Technology, Micro and Nanosystems (Betham Science), Environmental Engineering and Management Journal.
Membership CIGRE and IEEE.

ADDITIONAL INFORMATION

Research projects

1. **Partner coordinator:** H2020-ECSEL-2017-1-IA-TWO STAGE, Nr. 122386, POC-A1-A1.1.3-H/2019, "Integrated Development 4.0", http://www.idev40.eu/.

2. **Project manager**: PN-III-P1-1.2-PCCDI2017-0652 „Innovative Technologies for Advanced Materials Recovery from IT and Telecommunication Waste(Trade-IT)", contract nr. 84PCCDI/2018, https://tradeit.utcluj.ro/.

3. **Project manager**: PN-III-P2-2.1-BG-2016-0388 „Multiscalar-multigrid simulator of electro-thermo-mechanical processes in integrated power circuits (Set4CIP)", contract nr. 83BG/2016, http://set4cip.utcluj.ro/.

Principal representative

1. European University of Technology, 101124533 — EUt+ Accelerate- ERASMUS-EDU-2023-EUR-UNIV, https://www.univ-tech.eu/.

Project manager UTCN:

1. Transilvania Digital Innovation Hub - TDIHT, H2020-DIGITAL-2021-EDIH-01, 101083508, https://transilvaniadih.ro/.

Member of 10 national and international projects research teams

1. European University of Technology, 101004088 — EUt+, ERASMUS+ - European Universities EPP-EUR-UNIV-2020, https://www.univ-tech.eu/.
2. PNCDI III ID 386, "Susținerea excelenței în cercetarea din domeniul nanotehnologiilor şi materialelor avansate" (ExNanoMat) 21PFE/17.10.2018.
3. Super precision electrochemical machining technology including recycling of useful materials (SPECTRUM); 2001-2004; FP5 G1RD-CT-2000-00421, https://cordis.europa.eu/project/rcn/54894/factsheet/en.
4. Development and evaluation of industrial electrochemical reactors (DESINER) 2001-2003; FP5 BRPR-CT98-0800, https://cordis.europa.eu/project/rcn/46792/factsheet/en.
5. Dezvoltarea de noi tehnici numerice de analiza si implementarea acestora intr-un pachet software destinat optimizării 3D a dispozitivelor electromagnetice si electrochimice – DESIGN, BWS 04/03.
6. Metode noi de analiză şi software de simulare a efectelor interferenței electromagnetice dintre liniile de înaltă tensiune şi conductele metalice subterane, BIL 37/2000.
7. Dezvoltarea şi implementarea metodelor numerice de analiză şi proiectare optimală a dispozitivelor electromagnetice, BIL 96/174B0697.
8. Instrument de proiectare virtuala destinat modelarii suprafețelor deformabile a electrozilor in cursul proceselor electrochimice - PROGRAM IDEI 2538/2008.
9. Pachet software integrat de analiza si predicție a nivelului poluării electromagnetice produse de stații si linii din SEN asupra structurilor metalice vecine respectiv protecția catodica a acestora - PROGRAM IDEI 2539/2008.
10. Post-doc scholarship from the project: "Research and Innovation for Development and Progress of Post-Doctorate Activities in Engineering and Science – PRiDE", POSDRU/89/1.5/S/57083 (P, Title of research work "Development, validation and implementation of mathematical and numerical techniques for electrode shape prediction in electro-chemical processes.

Publications

Papers (selection):

1. Purcar M., Van den Bossche B., Bortels L., Deconinck J. Nelissen G. Three-dimensional current density distribution simulations for a resistive patterned wafer, Journal of the Electrochemical Society, Volume: 151, Pages D78-D86 (2004), DOI 10.1149/1.1772782. Citations: 12

2. Pantleon K., Van den Bossche B., Purcar M., Bariani P., Floridor G. Simulation and experimental determination of the macro-scale layer thickness distribution of electrodeposited Cu-line patterns on a wafer substrate, Journal of Applied Electrochemistry, Volume 35, Pages 472-478 (2005), DOI 10.1007/s10800-005-2321-4. Citations: 5.

3. Purcar M., Dorochenko A., Bortels L., Deconinck J., Van den Bossche B. Advanced CAD integrated approach for 3D electrochemical machining simulations, Journal of Materials Processing Technology, Volume 203, Pages 58-71, (2008), DOI 10.1149/1.1772782. Citations: 15.

4. Purcar M., Bortels L., Van den Bossche B., Deconinck J. 3D electrochemical machining computer simulations, Journal of Materials Processing Technology, Volume 149, Pages 486-492 (2004), DOI 10.1016/j.jmatprotec.2007.09.082. Citations: 42

5. Bortels L., Purcar M., Van den Bossche B., Deconinck J. A user-friendly simulation software tool for 3D ECM, J Journal of Materials Processing Technology, Volume 149, Pages 589-598 (2004), DOI 10.1016/j.jmatprotec.2007.09.082. Citations: 10

6. Purcar M., Topa V., Munteanu C., Chereches R., Avram A., Grindei L. Optimisation of the layer thickness distribution in electrochemical processes using the level set method, IET Science, Measurement & Technology, Volume 6, issue5, p. 376 – 385 (2012). Citations: 3

7. Purcar M., Topa V., Munteanu C., Avram A., Grindei L, Chereches R. Optimization of the current density distribution in electrochemical cells based on the level set method and genetic algorithm, European Physical Journal-Applied Physics, Volume 56, Pages 11302-p1 -11302-p8, (2011), DOI 10.1051/epjap:2007098. Citations: 1

8. Purcar M., Dorochenko A., Bortels L., Deconinck J., Van den Bossche B. Electroforming simulations based on the level set method, European Physical Journal-Applied Physics, Volume 39, Pages 85-94 (2007), DOI 10.1051/epjap:2007098. Citations: 3

9. Purcar M., Munteanu C., Ţopa V., 3D electrode shape change simulation in electroplating, Revue Roumaine des Sciences Techniques, Série Électrotechnique et Énergétique (RRST), Volume 58, issue 3, Pages. 252-262 (2013) http://revue.elth.pub.ro/, ISSN 0035-4066. Citations: 1

10. R. Chereches, Barba, Di, V. Topa, M. Purcar, S. Wiak Optimal shape design of electrostatic microactuators: A multiobjective formulation, in INTERNATIONAL JOURNAL OF APPLIED ELECTROMAGNETICS AND MECHANICS, vol. 43, no. 1-2, pp. 65-76, 2013. Citations no: 2

11. Bojita A., Boianceanu C., Purcar M., Florea C., Simon D. and Pleșa C., “A simple metal-semiconductor substructure for the advanced thermo-mechanical numerical modeling of the power integrated circuits”, Journal of Microelectronics Reliability, Elsevier, Volume 87, pages 142-150, August 2018, https://doi.org/10.1016/j.microrel.2018.06.013.

Books (selection):

1. Purcar, M., Bojiță, A., Avram A., CAD Tools, ISBN 978-606-737-408-7, 136 p., Editura UTPress Publishing, Cluj-Napoca 2019.

2. Purcar, M., Modeling the Electrode Shape Changes for Electroforming and Electrochemical Machining Processes, ISBN 978-973-713-272-7, 181 p., Editura Mediamira, Cluj-Napoca 2010.

International Patent:

DEVICE FOR ELECTROCHEMICALLY PROCESSING PLATE-SHAPED OBJECT E.G. PRINTED CIRCUIT BOARD HAS ROD-SHAPED COELECTRODES CONNECTED TO HOLDER, EXTENDS TOWARDS OBJECT AND WITH POLARITY OPPOSITE TO POLARITY OF COUNTER ELECTRODE IN USE” WO2008010090-A2, 24 JAN. 2008; NL1032174-C2 15 JAN 2008

17.11.2024 **PURCAR IOAN MARIUS**