

ALIN DRAGOȘ BOGDAN MOLDOVEANU



Curriculum vitae

CONTENTS

DEGREES	2
JOB POSITIONS	2
RESEARCH	3
Summary	3
Overview of research activity	3
Virtual Reality	4
eLearning.....	4
Advanced 3D Visualization in Electronic Circuits Design.....	4
eHealth	4
Projects list	5
As director or partner responsible	5
As team member	6
Membership in committees	7

DEGREES

- 2010-2013. *Post doctoral study* at UPB-ACC (POLITEHNICA University of Bucharest, Faculty of Automatic Control and Computers):
"Collaborative *MMO mixed reality education - 3DUPB - 3D MMO virtual representation and interaction service*".
- 2000-2008. *Ph.D. in Computer Science* (Virtual Reality, Software Eng., Ubiquitous Comp.) at UPB-ACC:
"*Concepts and Scalable Architectures for Extensible 3D Virtual Spaces*".
- 1998-1999. *Master in Computer Science* (Advanced Software Systems) at UPB-ACC.
Completed with maximum degree (10.00).
- 1993-1998. *Engineering studies in Computer Science* (architectures, languages, data structures and algorithms, comp. graphics, AI, databases, maths, physics, electronics) at UPB-ACC.
Graduated as Engineer in Computer Science, with maximum degree (10.00).
Chief of Promotion (valedictorian)
- 1989-1993. High school education. High School of Informatics (M.F.1 Tudor Vianu), Bucharest
Graduation degree: 9.93 (2nd position in my series).
- 1993-2010: Various trainings and stages at universities or companies, as a student or visiting professor, from India, Italy, Germany, Poland, Czech Republic, Turkey, Belgium, Sweden.

JOB POSITIONS

- *Professor* (2015-present), *Associate Professor* (2009-2015), *Lecturer* (2005-2009), *Teaching Assistant* (1999-2005) at UPB-ACC. Attributions include:
 - Courses, laboratories & projects at bachelor and master level:
 - Software Engineering;
 - Advanced Software Engineering;
 - Introduction to Virtual Reality;
 - Development of Virtual Reality Applications.
 - Coordinating PhD students as PhD co-adviser.
 - Conducting diploma & dissertation projects.
 - Member or president in commissions: admission exams, diploma, dissertation.
 - Workshops, Summer Schools and trainings.
In particular, coordination of 3D Pub - The Computer Graphics and Virtual Reality Summer School, already at 7th edition, with 70 students for 2 months.
 - Visiting professor, invited lectures at national/international universities and events;
 - Research projects proposal and implementation (comprising ~60% of my work effort).
- Technical manager at Soft Plus Plus (2002-2009).
- Object oriented methodologies advisor at Ericsson Software Division Romania (1999-2000).
- Chief designer, Neuron S.R.L. (1995-1999).

RESEARCH

SUMMARY

Main areas:

- virtual reality;
- eHealth;
- software engineering;
- computer graphics;
- eLearning, serious gaming & gamification.

Membership in projects: 35 (national or international research and development projects).

Coordination experience: 11 projects as director or partner team coordinator.

Most recent projects:

- Sound of Vision – Natural sense of vision through acoustics and haptics (Horizon 2020, 2015–2017), UPB partner responsible, steering committee member, technical co-coordinator.
- TRAVEE – Virtual Therapist with Augmented Feedback for Neuromotor Recovery (PN-II, 2014–2016), project director.
- HAI-OPS – Hospital Acquired Infection and Outbreak Prevention System (Eurostars Project E98321, 2017–2020), UPB partner responsible
- Lib2Life – Revitalizing libraries and cultural heritage through advanced technologies (Complex national project, 2018–2020), UPB partner responsible

Publications:

- 14 books, book chapters or course notes
- over 100 papers in journals or conferences indexed in international databases

Awards:

- **Sound of Vision - Best “Tech for Society” Horizon 2020 project**, Awarded by EC through Innovation Radar, at ICT 2018
- Award of Excellence for Activity in eHealth and eLearning, by the Romanian Ministry of Economy and Romanian General Secretariat of the Government, 2014
- Premiul de excelență pentru activitatea în eLearning și eHealth, la Galele de excelență în industria românească, 2014.
- Eureka success story, for the project RETEMES (Reliability Testing of Medical Systems), 2008-2010.
- Best Paper Award for PhD Students: “Navigational 3D Audio-Based Game - Training Towards Rich Auditory Spatial Representation of the Environment”. O. Bălan, A. Moldoveanu, F. Moldoveanu, M. I. Dascălu. Proceedings of the 18th International Conference on System Theory, Control and Computing, Sinaia, Romania, October 17-19, 2014, pp. 688-693, ISBN 978-1-4799-4602-0
- Best paper award - “Developing a Navigational 3D Audio Game with Hierarchical Levels of Difficulty for the Visually Impaired Players”. O. Bălan, A. Moldoveanu, F. Moldoveanu, A. Butean. a 12-a Conferință Națională de Interacțiune Om-Calculator, 24-25 September 2015, Bucharest, Romania.
- Distinguished paper award – „The TRAVEE Neuromotor Rehabilitation System: in-Vivo Testing”. O. Ferche, A. Moldoveanu, M.I. Dascalu, C.N. Bodea, R. Lupu, D. Irimia, F. Moldoveanu. Zooming Innovation in Consumer Electronics International Conference (ZINC), 2017.
- 2018 BCI Award Nominee. Robert Gabriel Lupu, Florina Ungureanu, Oana Ferche, Alin Moldoveanu. Neuromotor Recovery based on BCI, FES, Virtual Reality and Augmented Feedback for upper limbs.

Memberships:

- member in over 45 committees of journals and conferences, mostly ISI or IEEE indexed

OVERVIEW OF RESEARCH ACTIVITY

My research focus is on original, innovative, applied research. I aim to create new concepts and make them come alive into real-life, alive projects. Without neglecting the huge importance of purely theoretical research, it is my strong opinion that in my fields of activity, concrete, functional results provide the only way to ensure the validity of the solutions and their practical significance.

Software engineering, computer graphics and virtual reality form my core expertise. The fields where I applied and further developed it, either through individual research (as with my PhD thesis), or as research team member or coordinator, are: 3D virtual spaces, eHealth and eLearning.

In the following I will briefly indicate my main contributions in each area.

VIRTUAL REALITY

My PhD thesis "Concepts and Scalable Architectures for Extensible 3D Virtual Spaces" (2008) sets a new perspective for 3D Virtual Spaces, as key paradigm of future computer mediated human interaction. It addresses field issues with solutions at conceptual level (introducing the principles of extensibility, interconnectivity and reflexivity) and software architectures (for large scale adoption), in an economically feasible approach, being the first researcher to introduce GPGPU in such architectures. These theoretical contributions were validated through complex practical achievements: a RAD toolkit for 3D virtual spaces, a mini-prototype of 3D MMO (massive multiplayer online) server, and the 3D Virtual Technical Museum of Vienna (replica of real one).

Based on this inception work I also published one of the first books on Virtual Reality from Romania, with the aim to support the growth of this promising field.

Continuing the ideas from the thesis, I further explored the 3D MMO potential for education through prototypes and experiments.

ELEARNING

I developed the concept behind "3D UPB" (3D Real-time Mixed Reality Campus), a complex R&D project initiated during my postdoctoral stage ("Collaborative MMO mixed reality education", 2010-2013). With its public release scheduled for 2016, this project will make UPB (my home university) the first one in the world featuring such a mixed reality replica, with direct educational and social impact and opening possibilities for new, highly interactive distance education.

Such research made me understand, in time, the huge potential of mixed reality, which I put at the core of my latest research, described later on.

ADVANCED 3D VISUALIZATION IN ELECTRONIC CIRCUITS DESIGN

Through interdisciplinary collaboration, I developed a brand new method for analyzing electronic circuits, disseminated in top journals & conferences, with potential of radically improving the domain: 3D Smith Charts - *3D complex resistance and impedance visualization on the Riemann sphere*. This method uses the power of 3D visualization, through an innovative mapping function, to overcome the limitations of the traditional, widely used Smith Chart.

EHEALTH

The largest part of my research activity was concerned with eHealth. I was involved in many international or national research projects (for space reasons I will just indicate a brief selection):

My older projects in this area addressed large (enterprise scale) eHealth software services, such as:

- *(an Eureka success story)*: RETEMES (Reliability Testing of Medical Systems), 2008-2010.
- VISUAL-D (Visualization of Patient Data for easy mngmt. of care processes), 2011-2013.
- MORIS F.D. (Med. Operational Risks Identification Serv. & Fraud Detection), 2011-2013;
- EUGEN (Enterprise Unified Guideline Engine), 2010-2012.

Gradually, I made the transition towards close support for clinical act or the patient himself - through advanced 3D visualizations and especially through virtual reality, in projects such as:

- SABIMAS (Advanced IT solution for heap arthroplasty implants), 2008-2011.
- IHRG (Intelligent haptic glove for the patients suffering a stroke), 2012-2014

Worth mentioning, besides valuable scientific results, disseminated, all these research works completed with an innovative working solution, some being still used in practice.

With increasing experience and field knowledge, I found motivation to improve critical aspects in healthcare, which dramatically affect large numbers of people.

This is reflected in *my latest research works, that I undertook as director or partner responsible, based on original ideas created and evolved by me, together with the same team that will be involved in SoundBridge:*

- TRAVEE (Virtual Therapist with Augmented Feedback for Neuromotor Recovery) introduces and explores the brand new idea of magnified feedback, a promising way to overcome critical shortcomings of traditional methods of post-stroke recovery. The project will develop a prototype and use it in a clinical trial with control group. 2014-2016.
- Sound of Vision (Natural sense of vision through acoustics and haptics), Horizon 2020: a large European project, with 9 partners, based on a concept that I initiated and refined with support from the consortium, concept that goes beyond the state of the art of the *visual sensory substitution systems*, opening premises to achieve the creation of a powerful yet affordable assistive device for VIPs. 2015-2017.

Worth mentioning, in both of these 2 projects I elaborated the core concepts, based on innovative mixed reality, neurosciences, assisted natural learning, gamification and controlled immersion.

My current work includes also the concept and implementation of an automated system for the prevention of hospital acquired infections - HAI-OPS - Hospital Acquired Infection and Outbreak Prevention System (2016-2018).

PROJECTS LIST

AS DIRECTOR OR PARTNER RESPONSIBLE

- Lib2Life - Revitalizing libraries and cultural heritage through advanced technologies (Revitalizarea bibliotecilor și a patrimoniului cultural prin tehnologii avansate)
National project, Complex Project, March 2018 – 2020
Total value: 5,285,104 RON. UPB partner value: 2,636,292 RON
Roles: UPB partner coordinator; coordinator for the sub-project “Cyber-Physical Library – Reconstrucții 3D imersive și interactive ale bibliotecilor și adnotări digitale socio-colaborative pentru cărțile fizice”
- Sound of Vision - Natural sense of vision through acoustics and haptics
Horizon 2020, H2020-PHC-2014. ID. 643636, 2015-2017.
Total value: 3,960,709 Euro. UPB partner value: 575,938 Euro
Roles: Principal elaborator of the proposal; UPB partner responsible. Technical co-coordinator for the whole team of 9 partners (together with University of Iceland).
- HAI-OPS - Hospital Acquired Infection and Outbreak Prevention System (Eurostars Project E98321), UPB partner responsible
- TRAVEE - Virtual Therapist with Augmented Feedback for Neuromotor Recovery
National partnerships project, PN-II, ID. 1/2014(PN-II-PT-PCCA-2013-4-1580), 2014 - 2016
Role: Director. Value: 285,000 Euro. Special mentions: project ranked 1st in the competition.
- AESOP (A European and South African Partnership on Heritage and Past)
Erasmus Mundus Action 2 Partnerships. 2013-2017. Partner coordinator (UPB).
- 3DXP - „Animatia si grafica 3D, un pas catre viitor” (3D Animation and Graphics, a Step towards the Future)
National project, POSDRU, ID. 81673. 2012 - 2013.
Responsible with implementation.
- QUESTOR (Quest for Reports), Eureka! 5883. 2012-2013. Partner coordinator (UPB).
- Strategic Planning for Sustainable Clustering of Collaborative SMEs (SMEcluster)
LdV 2008-1-TR1-LEO05-03157, 2008-2010. Partner coordinator (UPB).
- Establishment of Sustainable Collaborative SME Networks (SMEnet)
LdV, UPB id I130902. 2008-2010. Partner coordinator (UPB).
- Online solution for products and campaigns classification
A.C.P.C. - UPB. 2008-2009. Partner coordinator (UPB).
- Virtual 3D Technical Museum of Vienna, Embedded Navigational and Informational System.
Beneficiary: Technical Museum of Vienna. 2005-2006. Partner coordinator (Soft Plus Plus SRL).

- 3D UPB, UPB internal financing, 2009 – 2016. Director.
- Neuron GIS, Bucharest City Hall, other city halls, Neuron SRL. 1995-2002. Partner coordinator (Neuron SRL). Responsible with software development activities.

AS TEAM MEMBER

- IHRG (An intelligent haptic glove for the patients suffering a cerebrovascular accident) PNCDII-Parteneriate, 2012-2014
- VISUAL-D (Visualization of Patient Data for easy management of care processes) Eurostars E!6126, 2011-2013.
- MORIS F. D. (Medical Operational Risks Identification Service and Fraud Detection) Eureka E!5884, 2011-2013;
- SABIMAS (Sistem Informatic avansat, bazat pe imagistica medicala, pentru producerea implanturilor personalizate dedicate artroplastiei de sold) ANCS, CNMP, PNII- Parteneriate, 12107/01.10.2008. 2008-2011.
- Reliability Testing of Medical Systems (RETEMES) EUREKA, E !4053 /ReTeMeS, numar Inregistrare la AMCSIT: 289E / 2008, numar Inregistrare UPB : I130901. 2008-2010.
- EUGEN (Enterprise Unified Guideline Engine) Eurostars E!5119/298E, AMCSIT. 2010-2012.
- RELIS (Risk Detection In Laboratory Information Systems) Eurostars E!5112/300E, AMCSIT, nr UPB I131002, 2010-2012.
- Near - Shoring: The Next Step In OffShoring European Lifelong Learning Programme, Intensive Programme, 2008-2010.
- FCINT (Framework pentru compunerea serviciilor, bazat pe ontologii pentru agregarea cunostintelor si informatiilor din cladiri inteligente) Cod SMIS-CSNR 12038, POS-CCE, O212. 2010-2013.
- Sisteme numerice de control si Aplicatii industriale contract 216, Program P V – Inovare, AMCSIT. 2008.
- Partajarea Resurselor de Instruire si de Cercetare CNMP, 24 CEEEX - I03/10.10.2005. 2005.
- Concept de Sistem Integrat de Analiza si Evaluare a Riscului la Nivel Judetean avand ca Suport Sisteme Informatice Geografice AMTRANS, Nr. 5A03 din 04.08.2003. 2003-2005.
- Sistem de Baze de Date Relationale Integrat intr-un Sistem Informatic Geografic, 2004 AMTRANS, 7A09 din 09.09.2004. 2004-2005.
- PMCIO (Planning And Management of Computer Networks Interactive-Online) proiect de cercetare in colaborare cu Universitatea de Stiinte Aplicate din Regensburg. 2003-2008.
- WICNET (Wireless Communication and Networking) proiect de cercetare UPB - Univ. de Stiinte Aplicate din Regensburg. 2004-2008.
- Virtual Laboratory of Computer Networks and Network Management proiect de cercetare UPB - Univ de Stiinte Aplicate din Regensburg, Germania. 2001-2006.
- Who's Afraid of ... Athens ? – Multimedia Interactive Tour, Prprompt, T.E.I. – Technological Educational Institute of Piraeus. 2005-2006.
- Opening the Lion's Gate – Prezentare multimedia de tip info-taining, bazata pe video si harti 2D interactive. Prprompt, T.E.I. – Technological Educational Institute of Piraeus. 2005-2006.
- Cathedrals 21st Century / Stadiums, Arenas, Theme World – Munich International Trade Fairs. Prprompt. 2006.
- Management Software for a Fully Switched Low Cost Network proiect de cercetare UPB - Univ. de Stiinte Aplicate din Regensburg, Germania. 2004-2005.
- Multimedia Home Platform proiect de cercetare cu Universitatea de Stiinte Aplicate din Regensburg, Germania. 2003-2004.
- Neuron GIS Neuron SRL, Primaria Municipiului Bucuresti, alte primarii, 1995-2002. participant (director dezvoltare software).
- Geographical Information System for the Real Estate market ANSTI. 2000-2001.

MEMBERSHIP IN COMMITTEES

Journals

- To be updated
- Collective Intelligent Information and Database Systems (2016, special issue of Journal of Intelligent & Fuzzy Systems) – member of guest editorial board.

Conferences

2019

- Creativity in Intelligent Technologies & Data Science - CITDS2019
- RoCHI 2019 - Romanian Human-Computer Interaction Conference 2018 – President
- Computer Vision Conference (CVC) 2019 – PC member
- Computing Conference 2019 – PC member

2018

- IBIMA 2018 - 31st IBIMA conference – PC member
- ICCCI 2018 - 10th International Conference on Computational Collective Intelligence – PC member
- FTC 2018 - Future Technologies Conference 2018 – PC member
- RoCHI 2018 - Romanian Human-Computer Interaction Conference 2018 – PC member

2017

- FTC 2017 - Future Technologies Conference 2017 - PC Member
- CIT&DS 2017 - Creativity in Intelligent Technologies & Data Science 2017 - PC Member
- TSP 2017 - 40th International Conference on Telecommunications and Signal Processing (TSP) – PC member
- ICCCI 2017 - 9th International Conference on Computational Collective Intelligence – PC member
- RoCHI 2017 - Romanian Human-Computer Interaction Conference 2017 (ROCHI2017) – PC member

2016

- Dev-play - The First Romanian Conference on Game Development, September 2016, Educational panel member.
- AICCSA 2016 (The 13th ACS/IEEE International Conference on Computer Systems and Applications) - program committee member
- 2nd International Workshop on Technology-enhanced Learning to Improve Quality of Life - in conjunction with eLSE 2016 - TELIQOL 2016 - organizer
- The 11th eLearning and Software for Education Conference (eLSE 2016) - membru in comitetul stiintific
- Future Technologies Conference 2016 - program committee member
- The Romanian Human-Computer Interaction Conference 2016 (ROCHI2016) - program committee member
- **39th International Conference on Telecommunications and Signal Processing (TSP) 2016**- program committee member
- SAI Computing Conference 2016 - program committee member
- INISTA 2016 – 2016 International Symposium on INnovations in Intelligent SysTems and Applications - program committee member
- ICCCI 2016 - The 8th International Conference on Computational Collective Intelligence - program committee member

2015 or older

- IntelliSys 2015 - SAI Intelligent Systems Conference 2015 - program committee member
- Conference on Creativity in Intelligent Technologies & Data Science CITandDS2015 - program committee member
- The 24rd IBIMA conference on Innovation Vision 2020: from Regional Development Sustainability to Global Economic Growth (IBIMA 2015) - program committee member
- The 7th International Conference on Computational Collective Intelligence Technologies and Applications (ICCI2015) - program committee member
- 7th Balkan Conference in Informatics (BCI'2015) - program committee member
- First International Workshop on Technology-enhanced Learning to Improve Quality of Life - in conjunction with the 11th eLearning and Software for Education Conference - TELIQOL 2015 - organizer.
- 1st Workshop on Assistive, Rehabilitation, Diagnosis & Therapeutic Engineering - in conjunction with CSCS20, the 20th International Conference on Control Systems and Computer Science - WARE 2015 - organizer.
- The 11th eLearning and Software for Education Conference (eLSE 2015) - scientific committee member
- The Romanian Human-Computer Interaction Conference 2015 (ROCHI2015) - program committee member
- Science and Information Conference 2015, IEEE - program committee member
- The 10th eLearning and Software for Education Conference (eLSE 2014) - scientific committee member
- The 23rd IBIMA conference on Vision 2020: Sustainable Growth, Economic Development, and Global Competitiveness (IBIMA 2014) - program committee member
- The International Conference on System Theory, Control and Computing (ICSTCC 2014) - scientific committee member, session chair.
- The 6th International Conference on Computational Collective Intelligence Technologies and Applications (ICCI2014) - program committee member
- The 11th Joint Conference on Knowledge-Based Software Engineering (JCKBSE 2014) - program committee member
- Collective Intelligence in Web Systems - Web Systems Analysis (WebSys'2014) - program committee member
- Visual Computing - invited session at The International Conference on System Theory, Control and Computing (ICSTCC 2014) - chair
- The Romanian Human-Computer Interaction Conference 2014 (ROCHI2014) - program committee member
- The 9th eLearning and Software for Education Conference (eLSE 2013) - scientific committee member

- International Conference on Systems and Computer Science (ICSCS 2013) - program committee member
- Collective Intelligence in Web Systems Web Systems Analysis (WebSys'2013) - program committee member
- The 8th eLearning and Software for Education Conference (eLSE 2012) - scientific committee member
- The Romanian Human-Computer Interaction Conference 2013 (ROCHI2013) - program committee member
- Romanian Journal of Human - Computer Interaction (RRIOC) ISSN 1843-4460 - editorial committee member
- Signal, Image and Video Processing ISSN 1863-1711 - editorial committee member
- BMC Medical Informatics and Decision Making - reviewer;
- Scientific Bulletin of UPB - editorial committee member.

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