Marius LEORDEANU

Total Citations (Google Scholar): **8077, H-index: 37**
DBLP Profile: https://dblp.org/pid/21/5985.html
Website: https://sites.google.com/site/mariusleordeanu/home
Google Scholar: https://scholar.google.com/citations?user=se9kni0AAAAJ&hl=en&oi=ao

EDUCATION

PhD in Robotics, The Robotics Institute, Carnegie Mellon University, USA, 2009
Specialization in Computer Vision, GPA 3.92/4.0.
PhD Thesis: Spectral Graph Matching, Learning and Inference for Computer Vision
PhD Advisor: Professor Martial Hebert, Dean of the CMU School of Computer Science

Bachelor's in Mathematics and Computer Science, Hunter College – City University of New York, USA, 2003. GPA 3.88/4.0
Papers (CVPR, ICRA) on automatic registration of urban scenes, with Prof. Ioannis Stamos
Other research work on bipartite graph covering, with Prof. Cristina Zamfirescu

First Year of Undergraduate Studies – Faculty of Automation and Computer Science, Technical University of Cluj Napoca, 1999-2000. GPA 9.87/10

Habilitation in Computer Science, October 2015, Romanian Academy, Romania.

PROFESSIONAL AND ACADEMIC POSITIONS

Professor of Computer Science (2015-Present), University Politehnica of Bucharest.
Research Scientist (2010 - Present), Institute of Mathematics of the Romanian Academy.
Research Scientist (2022 - Present), Norwegian Research Center (NORCE), Norway

AWARDS

„Grigore Constantin Moisil" Award in Mathematics and Computer Science, the top prize awarded by the Ministry of Research, Innovation and Digitization at the Romanian Research Gala, 2024 (60K Euro)
Google Research Award, 2021-2022
Romanian Academy "Grigore Moisil" Award in Mathematics, 2014 (as single recipient)
Computing Research Association (CRA) Outstanding Undergraduate Award, USA, 2003.
Joseph A. Gillet Memorial Prize in Mathematics, USA, 2003.
Intel PhD Fellowship Award, USA, 2007 (less than 30 in USA per year awarded).
National Science Foundation Scholarship Award, USA, 2002.
Prizes at the National Physics Olympiad: Absolute First – 1994; 2nd – 1996, 1998; 3rd – 1995.
National Olympiad of Mathematics, Honorable Mention, 1997.

GRANTS WON AS PRINCIPAL INVESTIGATOR

1. ELIAS: European Lighthouse of AI for Sustainability, Call ID: HORIZON-CL4-2022-HUMAN-02-02, Budget of UPB Partner: 250K Euro
2. Google Research Gift Award, 2021, „Self-Supervised Multi-Task Hypergraphs", 50K US dollars.
3. EEA and Norway Grant 2019-2022: EEA-RO-2018-0496 (1.5 Million Euro) "Spacetime Vision – Towards Unsupervised Learning in the 4D World"
4. European Funds Grant 2015-2019: POC-A1.2.1D-2015-P39-287 (1 Million Euro) –„Automatic interpretation of images and video sequences using natural language processing" (PI with Traian Rebedea)
5. UEFISCDI Grant PN-III-P4-ID-PCE-2020-2819, 2021-2023 (250K Euro), „HyperVision: Unsupervised Visual Learning through Intelligent Equilibrium in Hypergraphs of Neural Networks"
6. UEFISCDI Grant 2018-2020: PN-III-P1-1.2-PCCDI2017-0734 (1.7 Million Euro) „Robots and Society: Cognitive Systems for Personal Robots and Autonomous Vehicles" (I am the PI of the IMAR Partner).
7. UEFISCDI Grant 2018-2020: TE-2016-2182 (100K Euro) « Vision in Words : Automatic Linguistic Description of Objects, People and their Interactions in Indoor Videos"
8. UEFISCDI ERC-like Grant 2016-2018: ERC-2016-0007 (170K Euro) "The Classifier Graph: A Recursive Multiclass Network for Deep Category Recognition in Images and Video".
9. UEFISCDI Grant 2016-2018: PED-2016-1842 (105K Euro) "Automatic linguistic descriptions of objects, people and their interactions in indoor videos".
10. UEFISCDI Grant 2012-2016: PCE-2012-4-0581 (300K Euro), "Automatic Video Understanding at Middle and Higher Levels of Interpretation".

PUBLISHED US PATENTS

1. Marius Leordeanu, Alina Marcu, Iulia Muntianu, Catalin Mutu, *Automatic detection, counting, and measurement of lumber boards using a handheld device*. U.S. Patent 11,216,905. 2022
2. Marius Leordeanu, Iulia Muntianu, Dragos Costea, and Catalin Mutu, *Automatic detection, counting, and measurement of logs using a handheld device*. U.S. Patent 11,189,022. 2021
3. Marius Leordeanu, Vlad Licaret, Tudor Buzu, Iulia Muntianu, Catalin Mutu, 2020. *Automatic detection, counting, and measurement of lumber boards using a handheld device*. U.S. Patent 10,586,321. 2020

SELECTED PUBLICATIONS AS PRINCIPAL AUTHOR

1. M. Leordeanu and M. Hebert, A Spectral Technique for Correspondence Problems Using Pair- wise Constraints, ICCV, 2005. Citations: 1514.
2. R. T. Collins, Y. Liu, M. Leordeanu: Online Selection of Discriminative Tracking Features. IEEE Trans. Pattern Anal. Mach. Intell. 27(10): 1631-1643 (2005). Ranked 1st in Computer Science; IF: 24.314; Citations: 2022
3. M. Leordeanu, R. Sukthankar, C. Sminchisescu: Generalized Boundaries from Multiple Image Interpretations. IEEE Trans. Pattern Anal. Mach. Intell. 36(7): 1312-1324 (2014). Ranked 1st in Computer Science; IF: 24.314; Citations: 62
4. M. Leordeanu, R. Sukthankar, M. Hebert: Unsupervised Learning for Graph Matching. Int. J. Comput. Vis. 96(1): 28-45 (2012) Q1. Impact factor: 13.369. Citations: 282
5. M. Leordeanu, M. Hebert and R. Sukthankar, An Integer Projected Fixed Point Method for Graph Matching and MAP Inference, NIPS, 2009. Citations: 391.
6. M Leordeanu, M. Hebert, R. Sukthankar, Beyond Local Appearance: Category Recognition from Pairwise Interactions of Simple Features, CVPR, 2007. Citations: 222.
7. M Leordeanu, R Sukthankar, C Sminchisescu, Efficient Closed-Form Solution to Generalized Boundary Detection, European Conference on Computer Vision, 2012. Citations: 99
8. M Leordeanu, A Zanfir, C Sminchisescu, Locally affine sparse-to-dense matching for motion and occlusion estimation, ICCV, 2013. Citations: 90.
9. M. Leordeanu, A. Zanfir and C. Sminchisescu, Semi-supervised Learning and Optimization for Hypergraph Matching, ICCV, 2011. Citations: 78.

10. M. Leordeanu and M. Hebert, Smoothing-based Optimization, CVPR, USA, 2008. Citations: 71.
11. M. Leordeanu and C. Sminchisescu, Efficient Hypergraph Clustering, AISTATS, 2012. Citations: 57
12. M. Leordeanu and R. Collins, Unsupervised Learning of Object Features from Video Sequences, CVPR, 2005. Citations: 53.
13. M. Leordeanu and M. Hebert, Efficient MAP Approximation for Dense Energy Functions, International Conference on Machine Learning (ICML, Rank A+), USA, 2006. Citations: 42
14. M. Leordeanu, A. Radu, S. Baluja, R. Sukthankar, Labeling the Features Not the Samples: Efficient Video Classification with Minimal Supervision, AAAI, 2016. Citations: 16.
15. Nicolicioiu, A., Duta, I. and M. Leordeanu. Recurrent space-time graph neural networks. *Advances in neural information processing systems* (NeurIPS), 2019. Citations: 39

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCS

PhD supervisor at the Doctoral School of the Romanian Academy

Graduated with PhD in 2022: Ioana Croitoru, Vlad Bogoin, Elena Burceanu, Emanuela Haller
Current PhD students: Alina Marcu, Dragos Costea, Mihai Pirvu, Mihai Masala, Nicolae Cudlenco and Florin Condrea.

We publish papers in top conferences and journals in computer vision, machine learning, robotics and general artificial intelligence, such as: ICCV, CVPR, TPAMI, IJCV, NeurIPS, ECCV, AAAI, IJCAI, ICRA, BMVC.

Former postdoctoral mentor of: Prof. Radu Ionescu (University of Bucharest), with joint papers at top international conferences (ICCV, CVPR, WACV) and Assoc. Prof. Oana Balan (UPB), with joint articles in relevant journals, conferences and books (highly cited in a relatively short period).

ORGANIZATION OF SCIENTIFIC EVENTS

General Chair and Co-Organizer, Embedded Computer Vision Workshop (EVW) for 2021, 2022, 2023 and 2024 (upcoming) in conjunction with Computer Vision and Pattern Recognition (CVPR) - top 3 international computer vision conference.
Website of EVW Workshops (all editions): https://embeddedvisionworkshop.wordpress.com/
Program Chair and Co-Organizer, Embedded Computer Vision Workshop (EVW) for 2020 in conjunction with European Conference on Computer Vision (ECCV) - top 3 international computer vision conference.
Co-Organizer of the **Eastern European Summer School in Machine Learning (EEML) 2019**, (www.eeml.eu), together with colleagues from DeepMind, University Politehnica of Bucharest and Bitdefender. It is the top international machine learning summer school in Eastern Europe.
Co-Organizer, together with colleagues from Diaspora and Romania, of workshop **„Human-centered Approaches for Trustworthy Artificial Intelligence", Smart Diaspora Conf. 2023.**
Co-Organizer of the **International Summer School on Imaging for Medical Applications (SSIMA)**, Sibiu, 2018 (http://gomit.tech/ssima/). It is the top international summer school in medical imaging in Eastern Europe, with participation from renowned scientists and professors.
Special Sessions Chair for **ACM International Conference on Multimedia Retreival**, 2017. It is one of the top international conferences in the world on multimedia processing.
Co-chair, **Exploratory Workshop on Computer Vision, Learning and Robotics**, for the conference "Diaspora in Cercetarea Stiintifica si Invatamantul Superior din Romania", 2012.

MAJOR COLLABORATIONS

1. We are part of a **Network of Excellence in Artificial Intelligence at the European Level** - a consortium of 33 of the most prestigeous European universities and research centers from 17 European countries

working together on the large-scale project ELIAS: European Lighthouse of AI for Sustainability (https://elias-ai.eu/).

2. Starting with our **EEA and Norway Grant „Spacetime Vision", we are growing a long-term collaboration with the Norway Research Institute (NORCE),** one of the largest research organizations in Norway. Within NORCE, we emphasize our solid collaboration with the Research Group of Dr. Nabil Belbachir, a leading world expert on smart cameras and embedded vision systems. The collaboration evolved by: a) the addition of several other projects, with Norwegian funding and involvement of our young researchers in the group (Vlad Licaret and Andrei Jelea); b) regular bilateral research visits to Norway and Romania; c) joint organization of events such as the Embedded Vision Workshop in conjunction with top international conferences (CVPR and ECCV), over several years and continuing (2019-2023): https://embeddedvisionworkshop.wordpress.com/); d) Participation as invited speaker at the Autumn School for Machine Learning for Vision for Industrial Applications (organized by NORCE), in a list of internationally renowned professors and scientists (https://www.norceresearch.no/en/events/malvic21).

3. **Long-term collaboration with Google Research**, through Dr. Rahul Sukthankar, Vice-President of Research at Google, with whom we developed many ideas and published papers in top conferences and journals in the last 5-10 years. Google also offered my group a **Research Award in 2021** for our excellent results.

4. **Active collaboration with researchers from the Romanian Diaspora from Google DeepMind:** together with well-known international scientists Viorica Patraucean and Razvan Pascanu, we co-organized scientific events (EEML 2019), wrote the very first draft of the Romanian AI Hub (in 2020) and participated as invited speaker in AI events they organized (Romanian AI Days, Brasov 2020 and Oradea 2023).

5. Together with my PhD students (at that time), **Ioana Croitoru and Vlad Bogolin**, we started in 2020 a collaboration with the group of **Andrew ZISSERMAN (University of Oxford),** from which two joint papers followed: a published ICCV 2021 paper (with 110 citations in 2 years) and another journal article, with Minor revision submitted at the prestigeous Artificial Intelligence journal.

RESEARCH COORDINATOR AND ARCHITECT IN INDUSTRY

- **Collaboration with BITDEFENDER:** coordinated a team of four people (Elena Burceanu, PhD; Emanuella Haller, PhD; Iulia Duta, currently doctoral student at Cambridge University; Andrei Nicolicioiu, doctoral student at MILA-Quebec AI Institute), with top results in machine learning and computer vision, published in premier conferences and journals (NeurIPS, TPAMI, ICCV, IJCAI, ECCV, BMVC).

  US Patent patent application with Bitdefender:
  Burceanu, E., Haller, E., Leordeanu, M., Prejbeanu, R. and Cernat, C.D., Bitdefender IPR Management Ltd, 2023. Computer Security Systems and Methods Using Self-Supervised Consensus-Building Machine Learning. U.S. Patent Application 17/656,644.

- **Collaboration with FORDAQ:** coordinated a team of five people on three artificial intelligence projects for automating the wood industry: **1)TallyExpress** (tallyexpress.com), the first intelligent system in the world for measuring and counting lumber boards with a smartphone (2 US Patents granted), with over 200 clients in United States and over 2 Million US dollars revenue in the last 3 years; **2)** The first system of counting and measurement of wood logs with a smartphone **3) NeuralGrader** (neuralgrader.ro), an AI system that identifies defects and grades lumber at production speed. The project was co-financed, during

the first two years of development, by the European Regional Development Fund through the Competitiveness Operational Program 2014-2020.

Granted US Patents:

1. Leordeanu, Marius, Alina Elena Marcu, Iulia Muntianu, and Cătălin Mutu. "Automatic detection, counting, and measurement of lumber boards using a handheld device." (Part 2) U.S. Patent 11,216,905. 2022
2. Leordeanu, Marius, Iulia Muntianu, Dragos Cristian Costea, and Catalin Mutu. "Automatic detection, counting, and measurement of logs using a handheld device." U.S. Patent 11,189,022, 2021.
3. Leordeanu, Marius, Vlad Licaret, Tudor Buzu, Iulia Muntianu, and Catalin Mutu. "Automatic detection, counting, and measurement of lumber boards using a handheld device." U.S. Patent 10,586,321, 2020.

- **Collaboration with ARNIA:** coordinated research teams on various AI projects for medical applications, self-driving cars, document forgery detection, with clients in South Korea and Germany. Two papers published in top international conferences:
    1. Naiden, A., Paunescu, V., Kim, G., Jeon, B. and Leordeanu, M., 2019. Shift r-cnn: Deep monocular 3d object detection with closed-form geometric constraints. *IEEE international conference on image processing (ICIP)* **(85 citations)**
    2. Condrea, F., Ivan, V.A. and Leordeanu, M., 2020. In search of life: Learning from synthetic data to detect vital signs in videos. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops* **(11 citations).**

- **Collaboration with SIEMENS:** coordinating Florin Condrea (PhD student at IMAR and AI Research Engineer at Siemens), together with Dr. Saikiran Rapaka (Siemens, Princeton) and Dr. Lucian Itu (Siemens, Brasov) on various AI projects in medical image analysis. So far we have one article submission to a major journal:
    1. *Florin Condrea, S Rapaka, L Itu, P Sharma, J Sperl, AM Ali, M Leordeanu, "Anatomically aware dual-hop learning for pulmonary embolism detection in CT pulmonary angiograms." arXiv preprint arXiv:2303.17593 (2023).* ***3 Citations*** *Accepted with Minor Revisions at Computers in Biology and Medicine* ***(Q1) IF 7.7***

VISITING SCHOLAR AND INVITED TALKS

Invited Professor at University of Trento (Italy), to teach a doctoral short course, based on my book „Unsupervised Learning in Space and Time", September 2023.

„From the Romanian Research Laboratory to the Global Industry" talk given to distinguished representatives of the Minsitry of Education, Ministry of Research and Ministry of Defense, at the Romanian Parliament, December 2022.

Invited Speaker at the Autumn School on Machine Learning and Vision for Industrial Applications, Norway, October 2021.

Other invited talks: over 60 invited talks at international conferences, summer schools and labs, including talks given to: European Space Agency Workshiop on Artificial Intelligence (2021), TEDxUPB (https://www.youtube.com/watch?v=3DolxC2CW14&t=6s), DeepMind (London), Visual Geometry Group of Andrew Zisserman (University of Oxford), Computer Vision Group of Kostas Daniilidis (University of Pennsylvania, USA), Computer Vision Group of Ioannis Kakadiaris (University of Houston, USA), Computer Vision Group of Ioannis Stamos (City University of New York, USA).

SCIENTIFIC AND CULTURAL TV AND RADIO PROGRAMS

Special guest on many national TV and Radio Programs with ample interviews and discussions about artificial intelligence, in order to raise the public awareness and knowledge about this important topic, with its current limitations, as well as vast potential benefits for the society.
Full list of programs is available at: https://sites.google.com/site/mariusleordeanu/talks-and-tv-shows

Selected Programs (also available on YouTube):
Antena 1 – „Observatorul de Noapte" (Live), Interview with Marius Pancu, December 2023
Radio Romania Actualitati – Live on „Prietenii de la Radio" (2022) and „Intre Prieteni" (2020)
TVR1 – host of the "Authentic Romania" series, Episode 2, December 2019
TVR2 – "A Second Emigration", January 2016
Digi24 – "Bonton", February 2015
Digi24 – Digipedia Science – „Limits of Perception", hosted by Alexandru Mironov, April 2015
Discovery Channel – "A Career in Science", October 2014

MEMBER OF THE EDITORIAL BOARD OF PRESTIGIOUS JOURNALS

Editor - Transactions on Pattern Analysis and Machine Intelligence, Impact factor: 24.34.
Editor - Computer Vision and Image Understanding, Impact factor: 4.8.
Editor - Machine Vision and Applications (MVA), Impact factor: 3.3.
Guest Editor - „Sensors and Techniques for 3D Object Modelling", Sensors, 2020, IF: 3.8.

AREA CHAIR IN TOP CONFERENCES IN ARTIFICIAL INTELLIGENCE

Area Chair for the International Conference on Computer Vision (ICCV) 2019, Rank A+
Area Chair for Computer Vision and Pattern Recognition (CVPR) 2020, Rank A+
Area Chair for European Conference on Computer Vision (ECCV) 2020, Rank A
Area Chair for Winter Applications for Computer Vision (WACV) 2018, Rank A
Senior PC for Int. Joint Conference on Artificial Intelligence (IJCAI) 2020, 2022, 2024, Rank A+

PUBLISHED BOOKS, MUSIC COMPOSITION AND ART COLLABORATIONS

Scientific book

M. Leordeanu, Unsupervised Learning in Space and Time: A Modern Approach for Computer Vision using Graph-based Techniques and Deep Neural Networks, 297 pages, Springer Nature, May 2020. ISBN: 978-3-030-42127-4.

It is the best-selling book in the world on the topic of Unsupervised Learning since 2020, and it the 15th of all time, according to Bookauthority.org:
https://bookauthority.org/books/best-selling-unsupervised-learning-books?fbclid=IwAR3eSbrcBhLw1TCPaYOKFkDZro2VoeEQHjmrU0ilfojnQRgwYJQjJ2VkeXA

Artificial Intelligence and Art Projects in collaboration with National University of Arts

1. Artist Cristina Lazăr, Engineer Nicolae Roșia, Prof. Univ. Dr. Petru Lucaci (UNArte) and Prof. Univ. Dr. Marius Leordeanu (UPB) "SmileProject: Deep Immersive Art with Realtime Human AI Interaction" (https://sites.google.com/view/smile-Project), presented at: National Festival of Young Artists - Diploma (https://diplomafestival.ro/portofolii/proiectulzambet), October 2019; Binar National Festival (https://institute.ro/digital/binar-2019-5367.html), Novembre 2019; ArtWalkStreet Festival, presented on Calea Victoriei, Piața Revoluției (Bucharest Center), September 2019.

2. Dragos Costea, Cristina Lazăr and Marius Leordeanu, “Between Worlds”, art with AI visual work, selected and exhibited at Artbox.Project Miami 3.0, Miami, USA, December 2022.

3. Dragos Costea, Alina Marcu, Cristina Lazar, Marius Leordeanu *Maia: A Real-time Non-Verbal Chat for Human-AI Interaction* (initial version published on Arxiv, 2024), submitted to Nature Scientific Reports (Q1) IF 4.6, special issue on Engineering Human-Machine Interfaces

Popular science book

Marius Leordeanu, „My name is blue”, 178 pages, Valea Verde, 2016.
ISBN: 606-8834-04-7. Available at:
https://www.librariaeminescu.ro/ro/isbn/606-8834-04-7/Marius-Leordeanu__Ma-numesc-albastru.html

Poetry book

Marius Leordeanu, “The Story of a Word”, 76 pages, Papirus Media, 2013.
ISBN: 606-8137-39-1. Available at:
https://www.librariaeminescu.ro/ro/isbn/606-8137-39-1/Marius-Leordeanu__Povestea-unui-cuvant.html

Music

Graduate of the „George Enescu” Music School, 1987-1995 (8 years)
Specialization: Violin - Prof. Marusciac and Piano (secondary) - Prof. Rodica Gheorghiu

Music album (piano and electronic):

Composition and Intepretation: Marius Leordeanu,
Album title: „Supersonic”.
Recorded at Kemper Music Studios / Bucharest.
Produced by Ciprian Lemnaru and Marius Leordeanu.
Available on most music channels, including:
Spotify: https://open.spotify.com/album/6SPhzD088xm7xfqvIvzrg7
YouTube: https://youtube.com/playlist?list=OLAK5uy_mbGgwl0Mr08Ny0H9U8WkWzGtTTflMEWz0

Other musical works on YouTube: https://www.youtube.com/watch?v=kPD-krc5lFw&list=PLPrg1RkeOIEH1y8MNv7X_tUf5bYJez42y