Curriculum Vitae

PERSONAL INFORMATION

Family name, First name: **LEORDEANU, Marius**
Researcher unique identifier(s) **ORCID:** https://orcid.org/0000-0001-8479-8758
Date of birth: **May 11th, 1980**
Nationality: **Romanian**
URL for web site: https://sites.google.com/site/mariusleordeanu/home

- **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: Prof. Martial Hebert, Director of the Robotics Institute.

Hunter College – City University of New York, USA, 2003
Bachelor's degrees in Mathematics and Computer Science**,** GPA 3.88/4.0.
Research work on automatic 3D registration of large-scale urban scenes.
Scientific Advisor : Prof. Ioannis Stamos with whom we published a paper at CVPR 2003.

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

- **CURRENT POSITIONS**

Senior Lecturer, 2015–present, Computer Science Department, University Politehnica of Bucharest.
Senior Researcher, 2010 – present, Institute of Mathematics of the Romanian Academy.

- **FELLOWSHIPS AND AWARDS**

"Gigore Moisil" Prize in Mathematics, top award given by the Romanian Academy, 2014
Awarded the highly competitive Intel PhD Fellowship, USA, 2007-2009 (less than 30 in USA per year).
Honorable Mention, Computing Research Association Outstanding Undergraduate Award, USA, 2003.
Joseph A. Gillet Memorial Prize in Mathematics, USA, 2003.
National Science Foundation Scholarship, USA, 2002-2003.
Won seven national and international research grants as Principal Investigator, 2012-Present.
Honor Scholar at Hunter College – City University of New York, USA, all semesters.
Prizes at National Physics Olympiad, Romania (Absolute First, '94; Third, '95; Second, '96; Mention, '98).
National Olympiad Finalist in Mathematics, Romania (1997).

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

PhD supervisor of doctoral students: Ioana Croitoru, Vlad Bogolin, Emanuela Haller, Elena Burceanu, Alina Marcu, Dragos Costea, Iulia Paraicu and Nicolae Cudlenco, with all of whom we have already published papers in top venues and journals (ICCV, CVPR, ECCV, AAAI, IJCV, Neurocomputing)
Postdoctoral supervisor of Radu Ionescu (Univ. of Bucharest), with papers at CVPR and WACV and Oana Balan (Politehnica of Bucharest), with papers in Sensors, Symmetry,European Conf. on Inf. Systems

- **TEACHING ACTIVITIES**

I **teach** graduate level Computer Vision and Robotics (one per semester) in the Masters Program in Artificial Intelligence (in English), which I have introduced for the first time at Politehnica of Bucharest. I **organize and coordinate** an advanced weekly seminar in Machine Learning and Computer Vision. Our websites: https://sites.google.com/site/bucharestcomputervision/ and https://sites.google.com/view/bucv/home).

- **ORGANISATION OF SCIENTIFIC MEETINGS**

Co-Organizer of the Eastern European Summer School in Machine Learning (www.eeml.eu), together with colleagues from DeepMind, Politehnica of Bucharest and Bitdefender. It is the top ML summer school Eastern Europe.
Co-Organizer of the International Summer School on Imaging for Medical Applications, Sibiu, 2018 **(**http://gomit.tech/ssima/). It is the top summer school in medical imaging in Eastern Europe.
Co-chair and organizer for Exploratory Workshop on Computer Vision, Learning and Robotics, for the conference "*Diaspora in Cercetarea Stiintifica si Invatamantul Superior din Romania*", Bucharest, 2012.

- **REVIEWING ACTIVITIES**

Area Chair for the International Conference on Computer Vision (ICCV) 2019, Computer Vision and Pattern Recognition (CVPR) 2020, European Conference on Computer Vision (ECCV) 2020 and Winter Applications for Computer Vision (WACV) 2018 – the top conferences in computer vision

Area Editor for journals Computer Vision and Image Understanding (CVIU), Impact factor 3.07, Machine Vision and Applications (MVA), Impact factor: 2.0 and IET Computer Vision, Impact factor: 1.1
Guest Editor of the Special Issue on Sensors and Techniques for 3D Object Modelling, Sensors (IF: 3.03)
Special Sessions Chair for ACM International Conference on Multimedia Retreival, 2017.
Reviewer for many top conferences and journals in computer vision and machine learning, including PAMI, IJCV, CVPR, ICCV, ECCV, NeurIPS, AISTATS, ICML.

- **MAJOR COLLABORATIONS**

Andrew Zisserman and Sam Albaine (Visual Geomtry Group, University of Oxford), together with my PhD students Ioana Croitoru and Vlad Bogolin, on the topic of unsupervised learning in video, February 2020 – July 2020 (expected).
Rahul Sukthankar, Director of Research, Google AI, on many topics in computer vision, including current work on creating Unsupervised Learning Machines, 2006-Present.
Nabil Belbachir, Chief scientist at NORCE, Norway, on the topic of Smart Cameras and others related to our EEA-Grants 2019-2022 Project.

- **SCIENTIFIC GRANTS WON AS PRINCIPAL INVESTIGATOR**

EEA and Norway Grant 2019-2022: EEA-RO-2018-0496 (1.5 Million Euro) "Spacetime Vision – Towards Unsupervised Learning in the 4D World"
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).
UEFISCDI Grant 2018-2020: TE-2016-2182 (100K Euro) « Vision in Words : Automatic Linguistic Description of Objects, People and their Interactions in Indoor Videos"
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".
UEFISCDI Grant 2016-2018: PED-2016-1842 (105K Euro) "Automatic linguistic descriptions of objects, people and their interactions in indoor videos".
UEFISCDI Grant 2012-2016: PCE-2012-4-0581 (300K Euro), "Automatic Video Understanding at Middle and Higher Levels of Interpretation".
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)

- **INVITED TALKS**

2009-Present: over 50 keynote/invited talks at international conferences, summer schools and research laboratories, including the Visual Geometry Group http://www.robots.ox.ac.uk/~vgg/, led by Andrew Zisserman (University of Oxford), DeepMind (London), Computer Vision Group led by Kostas Daniilidis (University of Pennsylvania, USA), Computer Vision Group led by Ioannis Kakadiaris (University of Houston, USA), Ioannis Stamos's Computer Vision Group led by Ioannis Stamos (Graduate Center, City University of New York, USA).
Host and special guest of several **TV science programs:** TVR1 – host of the "Authentic Romania" series, Episode 2; Digi24 – "Bonton", TVR2 – "A Second Emigration", Discovery Channel – "A Career in Science", TEDxUPB. List of talks and shows: https://sites.google.com/site/mariusleordeanu/home

- **SCIENTIFIC PAPERS**

Total Citations (source: Google Scholar)**: 5583, h-index: 22**
Google Scholar Profile: http://scholar.google.ro/citations?user=se9kni0AAAAJ

Cumulated Impact Factor of Selected Journal Papers: 71.86

1. R. Collins, Y. Liu and M. Leordeanu, *Online Selection of Discriminative Tracking Features,* Pattern Analysis and Machine Intelligence (PAMI), 2005. **Impact factor: 17.73. Citations: 1823.**
2. M. Leordeanu, R. Sukthankar and C. Sminchisescu, *Generalized Boundaries from Multiple Image Interpretations,* Pattern Analysis and Machine Intelligence (PAMI), 2014. **Impact factor: 17.73. Cites: 36.**
3. M. Leordeanu, R. Sukthankar and M. Hebert, *Unsupervised Learning for Graph Matching*, International Journal of Computer Vision (IJCV), 2012**. Impact factor: 11.54. Citations: 195.**
4. I. Croitoru, V. Bogolin, M. Leordeanu, Unsupervised Learning of Foreground Object Segmentation, International Journal of Computer Vision (IJCV), **Impact Factor: 11.54 Citations: 4**
5. PK Allen, A. Troccoli, B. Smith, S. Murray, I. Stamos and M. Leordeanu, *New Methods for Digital Modeling of Historic Sites,* Computer Graphics and Applications, 2003. **Impact factor: 1.725. Cites: 107.**
6. O. Bălan, G. Moise, A. Moldoveanu, M. Leordeanu, F. Moldoveanu, Fear level classification based on emotional dimensions and machine learning techniques, Sensors, 19 (7), 2019 **Impact factor 3.03: Cites: 6**
7. O. Bălan, G. Moise, A. Moldoveanu, M. Leordeanu, F. Moldoveanu, An Investigation of Various Machine and Deep Learning Techniques Applied in Automatic Fear Level Detection and Acrophobia Virtual Therapy, Sensors, Vol 20(2), 2020. **Impact factor: 3.03**
9. O. Bălan, G. Moise, A. Moldoveanu, L. Petrescu, M. Leordeanu, F. Moldoveanu, Emotion Classification Based on Biophysical Signals and Machine Learning Techniques, Symmetry, 12 (1), 2020. **Imp. fact: 2.14**
10. N. Cudlenco, N. Popescu, M. Leordeanu, Reading into the mind's eye: boosting automatic visual recognition with EEG signals, Neurocomputing, 2019. **Impact factor: 3.317**

Selected Conference Papers
The following four International Conferences:
IEEE-International Conference on Computer Vision (ICCV), **Rank A+,**
Advances in Neural Information Processing Systems (NIPS), **Rank A+,**
IEEE-International Conference on Computer Vision and Pattern Recognition (CVPR), **Rank A+**, and
European Conference on Computer Vision (ECCV), **Rank A**, are at **the very top** in Computer Vision.

1. M. Leordeanu and M. Hebert, *A Spectral Technique for Correspondence Problems Using Pair-wise Constraints*, ICCV, 2005. **Citations: 1059.**
2. M. Leordeanu, M. Hebert and R. Sukthankar, *An Integer Projected Fixed Point Method for Graph Matching and MAP Inference*, NIPS, 2009. **Citations: 265.**
3. M Leordeanu, M. Hebert, R. Sukthankar, *Beyond Local Appearance: Category Recognition from Pairwise Interactions of Simple Features*, CVPR, 2007. **Citations: 199.**
4. M. Leordeanu, R. Sukthankar and C. Sminchisescu, *Efficient Closed-Form Solution to Generalized Boundary Detection*, ECCV, Florence, 2012. **Citations: 78**
5. M. Leordeanu, A. Zanfir and C. Sminchisescu, *Locally affine sparse-to-dense matching for motion and occlusion estimation*, ICCV, 2013. **Citations: 67**
6. M. Leordeanu, A. Zanfir and C. Sminchisescu, *Semi-supervised Learning and Optimization for Hypergraph Matching*, ICCV, Barcelona, 2011. **Cites: 55.**
7. M. Leordeanu and M. Hebert, *Smoothing-based Optimization*, CVPR, USA, 2008. **Citations: 42.**
8. M. Leordeanu and R. Collins, *Unsupervised Learning of Object Features from Video Sequences*, CVPR, 2005. **Citations: 42.**
9. M. Leordeanu and M. Hebert, *Efficient MAP Approximation for Dense Energy Functions*, International Conference on Machine Learning (ICML, **Rank A+**), USA, 2006. **Citations: 38**
10. M. Leordeanu and C. Sminchisescu, *Efficient Hypergraph Clustering*, AISTATS, 2012. **Citations: 34.**
11. M. Leordeanu, A. Radu, S. Baluja, R. Sukthankar, Labeling the Features Not the Samples: Efficient Video Classification with Minimal Supervision, AAAI, 2016. **Citations: 7**.
12. I. Stamos and M. Leordeanu, *Automated Feature-Based Registration of Urban Scences of Large Scale*, CVPR, 2003. **Citations: 229.**
13. J. Mairal, M. Leordeanu, F. Bach, M. Hebert and J. Ponce, *Discriminative Sparse Image Models for Class-Specific Edge Detection and Image Interpretation*, ECCV, 2008. **Citations: 248.**
14. J. Hays, M. Leordeanu, A. Efros and Y. Liu, *Discovering Texture Regularity as a Higher-order Correspondence Problem*, ECCV, 2006 **Citations: 196.**
15. M. Zanfir, M. Leordeanu, C. Sminchisescu, *The Moving Pose: An Efficient 3D Kinematics Descriptor for Low-Latency Action Recognition and Detection*, ICCV 2013, **Citations: 364.**

- **NOTABLE RESEARCH RESULTS**

Notable research on the topic of unsupervised learning related to the Ulysses project: since 2005 I have published several articles in top computer vision conferences and journals on the topic of unsupervised learning (CVPR 2005, ECCV 2006, CVPR 2007, CVPR 2009, IJCV 2012, ICCV 2011, AAAI 2016, ICCV 2017, IJCV 2019), most with focus on learning in video. I also wrote a book on unsupervised learning in space and time in which I present in detail many algorithms that combine graphical models and deep learning, within a unified view, which will appear in 2020 at Springer Nature. My work and results published show a solid understanding of the main topic of the project, which is necessary in order to fulfill its ambitious objectives.

Notable research on graph matching and graphical models: since 2005 I have built a strong foundation for graph matching, learning and inference algorithms for computer vision. I have introduced spectral formulations and optimization methods for graphical models, in the context of matching, learning and inference. More specifically, my contributions include: spectral graph and hypergraph matching and optimization, graph and hypergraph clustering, inference and learning in probabilistic graphical models, supervised, semi-supervised and unsupervised learning for graph and hypergraph matching, efficient discretization procedures that bring the relaxed solutions back to the original domain. My proposed models and computational algorithms for graph matching have been cited by about 2000 papers and 40 patents (http://www.freepatentsonline.com/)

Notable research and work on a wide range of topics: since 2003 my research interests and published work span a relatively vast area of computer vision and machine learning, as I am deeply in love with the search for the meaning, purpose and algorithmic principles of intelligence. Therefore, I have passionately worked and obtained published research results (besides the ones mentioned above on unsupervised learning and methods for graph matching and graphical models), in object tracking (PAMI 2005 and ECCV 2018), activity recognition in video (ICCV 2013, NeurIPS 2019), 3D modelling of urban scenes and historic sites (CVPR 2003, IEE CGA 2003), general numerical optimization (CVPR 2008), optical flow (ICCV 2013), detection of edges and boundaries (ECCV 2012, PAMI 2014), 3D object detection (ICIP 2019), curriculum learning (WACV 2020), semantic segmentation (AAAI 2017), detecting, counting and measuring wood in images (US Patent Application, 2018), computer vision for drones (ICCV 2017, CVPR 2018, ECCV 2018). I have also written three books, including one of poetry (2013) and prose (2016). In a novel collaboration with visual artists from University of Arts (Bucharest) we have created an Art-AI system (https://sites.google.com/view/smile-Project), which has been presented at three exhibitions at the national level: DIPLOMA Festival (https://diplomafestival.ro/portofolii/proiectulzambet) BINAR Festival, (https://institute.ro/digital/binar-2019-5367.html) and ArtWalkStreet Festival (http://www.artwalkstreet.ro/), in November 2019.

- **BOOKS, MUSIC and OTHER ACTIVITIES**

Scientific book: M. Leordeanu, *Unsupervised Learning in Space and Time: A Modern Approach for Computer Vision using Graph-based Techniques and Deep Neural Networks* (Book), 298 pages, April 2020

Art-Media Exhibitions

C. Lazar, N. Rosia, P. Lucaci and M. Leordeanu: SmileProject Deep Immersive Art with Realtime Human AI Interaction (https://sites.google.com/view/smile-Project), exhibited at Diploma (https://diplomafestival.ro/portofolii/proiectulzambet) and Binar Festivals (https://institute.ro/digital/binar-2019-5367.html) national art exhibitions, November 2019

Popular science book: M. Leordeanu, *My name is blue*, 178 pages, Green Valley, 2016
Poetry book: M. Leordeanu, *The story of a word*, 76 pages, Papirus Media, 2013.
Music composition: Available online at: https://www.youtube.com/user/MariusLeordeanu.