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Personal information

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Publications <https://rovislab.com/publications.html>

Work experience: Transilvania University of Brasov

- since May 2023 **Member of the Romanian Government's Scientific and Ethical Council in Artificial Intelligence.**
- since October 2022 **Founder/coordinator of the Mechatronics and Robotics Doctoral Study Program.**
- since November 2020 **Organizer of the Romanian AI Days Conference**, <https://days.airomania.eu>.
- since October 2017 **Coordinator of the Robotics Bachelor Study Program.**
- since June 2010 **Founder/head of RoviLab (Robotics Vision and Control Laboratory).**
- since October 2020 **Professor**, *Faculty of Electrical Engineering and Computer Science*, Transilvania University of Brasov, Romania.
- October 2016 - September 2020 **Associate Professor**, *Faculty of Electrical Engineering and Computer Science*, Transilvania University of Brasov, Romania.
- October 2012 - September 2016 **Lecturer**, *Faculty of Electrical Engineering and Computer Science*, Transilvania University of Brasov, Romania.

Work experience: Elektrobit Automotive

- since January 2018 **Global Technical Lead, Head of Artificial Intelligence**, *Cloud, Artificial Intelligence and Tools*, Elektrobit Automotive.

- since June 2017 **Country Technology Lead**, Elektrobit Automotive.
January 2014 - **Team Manager**, *Driver Assistance and Navigation Departments*, Elektrobit Automotive, Romania.
December 2017
June 2013 - **Senior Software Developer**, *Driver Assistance Department*, Elektrobit Automotive, Romania.
December 2013

Work experience: University of Bremen, Germany

- December 2011–April 2012 **Researcher @ Prof. Michael Beetz**, *Intelligent Autonomous Systems Group*, Technical University Munich, Germany, (<http://ias.cs.tum.edu/>).
- 2009–2010 **Experienced researcher @ Prof. Axel Graeser, Project leader**, *Institute of Automation*, University of Bremen, Germany.
Leader of the AMaRob (*Autonomous Manipulator control for rehabilitation Robots*) project (<http://www.amarob.de/>). The goal of this research project is to support people with multiple handicaps and elderly people in doing their activities of daily living with a rehabilitation robotic system (i.e. a wheelchair with mounted manipulator, vision system and computer based manipulator control). The designed care-providing robotic system, now in its third generation, is entitled FRIEND (*Functional Robot with dexterous arm and user-frIENdly interface for Disabled people*) (<http://www.friend4you.eu/>).
- 2006–2009 **Researcher @ Prof. Axel Graeser**, *Institute of Automation*, University of Bremen, Germany.
Researcher within the AMaRob project.

Education

- 2006–2010 **PhD degree (Magna Cum Laude)**, *Institute of Automation*, University of Bremen, Germany, *PhD*.
Thesis title: *Robust Machine Vision for Service Robotics*. Supervisor: Prof. Axel Graeser. The research objective is the synthesis of a robust vision system to be used in service robotics for reliable scene understanding aiming at precise visual guided object grasping. The key concept is closed-loop control introduced at image processing level for coping with external influences like variable illumination conditions and scene uncertainty.

2003–2006 **Diploma Engineer (top of the 2006 promotion)**, *Faculty of Electrical Engineering and Computer Science*, Transilvania University of Brasov, Romania, *System Engineer*.

Diploma project completed at Institute of Automation, University of Bremen, with title: Feedback control for the robust color object recognition in system FRIEND II. Supervisors: Prof. Axel Graeser and Prof. Florin Moldoveanu. This thesis approaches the field of color object recognition in variable illumination conditions. The proposed method adapts the parameters of the used image processing chain in a closed-loop manner based on a quality measure obtained from different levels of image processing like image segmentation and feature extraction.

2000–2003 **Engineer (top of the 2003 promotion)**, *Faculty of Electrical Engineering and Computer Science*, Transilvania University of Brasov, Romania, *Automation Engineer*.

Final project title: Development of a microcontroller based algorithmic state machine for use in process control. Supervisor: Prof. Florin Moldoveanu. In this thesis the synthesis of an algorithmic state machine on a Microchip PIC16F84 is treated from both the design and implementation perspectives. The implementation stage has been validated through the development of a traffic light controller.

Selected publications

- S.M. Grigorescu et. al. A Survey of Deep Learning Techniques for Autonomous Driving, *Journal of Field Robotics*, 2019 (**impact factor 8.3**)
- S.M. Grigorescu et. al. NeuroTrajectory: A Neuroevolutionary Approach to Local State Trajectory Learning for Autonomous Vehicles, *IEEE Robotics and Automation Letters*, 2019 (**impact factor 5.2**)
- S.M. Grigorescu et. al. LVD-NMPC: A Learning-based Vision Dynamics Approach to Nonlinear Model Predictive Control for Autonomous Vehicles, *Advanced Robotic Systems*, 2021 (**impact factor 2.3**)
- C. Ginerica et. al. ObserveNet Control: A Vision-Dynamics Learning Approach to Predictive Control in Autonomous Vehicles, *IEEE Robotics and Automation Letters*, 2021 (**impact factor 5.2**)
- S.M. Grigorescu et. al. Robust Camera Pose and Scene Structure Analysis for Service Robotics, *Robotics and Autonomous Systems*, Elsevier, 2011 (**impact factor 4.3**)
- S.M. Grigorescu et. al. A BCI Controlled Robotic Assistant for Quadriplegic People in Domestic and Professional Life, *Robotica*, Cambridge University Press, 2010 (**impact factor 2.7**)
- S.M. Grigorescu et. al. Cloud2Edge Elastic AI Framework for Prototyping and Deployment of AI Inference Engines in Autonomous Vehicles, *Sensors*, MDPI, 2020 (**impact factor 3.9**)

Selected research grants

- 2022-2024 *Artificial Intelligence based Control System for Legged Robots used in Autonomous Navigation, Mapping and Surveillance of Unstructured Environments (AI-LegRob)*, (125.000 EUR), UEFISCDI grant Nr. PED675/2021. **Project coordinator.**
- 2020-2023 *Democratizing a Cyber Security Toolkit for SMEs and MEs (CyberKIT4SMEs)*, (230.000 EUR) grant Nr. 883188, European Commission project, Elektrobit Automotive.
- 2006-2009 *Autonomous manipulator control for rehabilitation robots*, (1.273.916,00 EUR), BMBF – Bundesministerium für Bildung und Forschung). **Project coordinator.**

Teaching experience

Artificial Intelligence, Machine Learning
Computer Vision
Introduction to Robotics
C++ Basics and Application in Technical Systems

Awards

- October 2013 *Automotive and Drive Analytics - Intelligent automotive data analysis and prediction modules*, First place, Elektrobit Innovation Award 2013, Erlangen, Germany, October, 2013.
- November 2008 *Robust Object Classification and Recognition in Service Robotics (best poster award)*, Sorin Mihai Grigorescu and Sang-Wan Lee, 30th Colloquium of Automation, Salzhausen, Germany, November, 2008.
- June 2006 Excellence diploma from the Romanian Society of Automation and Industrial Informatics (SRAIT) for graduating head of class in the field of Automation and Industrial Informatics and for research activity.
- May 2006 Electrotechnical student scientific communication session, Transilvania University of Brasov: Pollution Guard – Air Pollution Monitoring and Warning System (first prize).
- 2006 IEEE Computer Society International Design Competition: Pollution Guard – A SCADA system for air pollution monitoring and warning (participation award).
- May 2005 Electrotechnical student scientific communication session, Transilvania University of Brasov: Synthesis of a neural command for controlling a 3-phase stepper motor using the DS80C420 microcontroller (first prize).

Patents (accepted)

- 2020 *Generating training images for machine learning-based objection recognition systems*, US Patent No. US10635935B2.
- 2023 *Deep learning based motion control of a vehicle*, EU Patent No. EP3800521B1.
- 2023 *Processing environmental data of an environment of a vehicle*, EU Patent No. US11741716B2.

Other

H-index (according to Google scholar): 14 (2070 citations)

Reviewer for different journals and conferences in the field of robotics (eg. *IEEE Trans. on Pattern Recognition and Machine Intelligence*, *IEEE Trans. on Neural Networks and Learning Systems*, *IEEE Trans. on Mechatronics*, *IEEE Trans. on Systems Man and Cybernetics*, *Journal of Machine Vision and Applications*, *ROBOTICA*, *Int. Conf on Robotics and Automation (ICRA)*, *Int. Conf. on Intelligent Robots and Systems (IROS)*, *Int. Conf. HUMANOIDS*, etc.).

Organizer of the 2012 Special session on Robotics, Vision and Real-time Data Processing withing the OPTIM 2012 conference, Brasov, Romania.

Chairman of the *Rehabilitation Robotics* section on the 2009 Int. Conf. on Intelligent RObots and Systems IROS, Saint Louis, USA, 2009.

Chairman of the *Perception and Sensing* section on the 18th Int. Federation of Automatic Control IFAC World Congress, Milano, Italy, 2011.

Chairman of the *Applied Mathematics* section on Congress on Information Technology, Computational and Experimental Physics CITCEP 2015, Cracow, Poland, 2015.

Invited researcher: Korea Advance Institute of Science and Technology (KAIST), Daejeon, Korea, 2008 and 2009.

Invited researcher: Technical University Munich TUM, Munich, Germany, 2011-2012.

Invited researcher: JAUME I University, Castellon de la Plana, Spain, 2007 and 2008.

Invited researcher: National University of Electro-Communications, Japan, 2009.

Invited researcher: Szechenyi Istvan University, Gyor, Hungary, 2011 and 2012.

Research interests

Artificial Intelligence	Deep learning, Learning control, One-shot learning.
Computer vision	Simultaneous Localization and Mapping (SLAM), Autonomous vision, Environment understanding, Feedback structures in machine vision, Object tracking, Robust object recognition, Stereo vision, 3D Reconstruction.
Robotics	Autonomous driving, Visual control of robots, Rehabilitation and service robotics.

Computer skills

Programming concepts	Model Driven Development, Universal Modeling Language, System Modeling Language, Distributed systems.
Programming languages	C/C++, Python, Pascal, Delphi, Java, Assembler (x86 compatible instruction set and more), SQL, PHP.
Programming environments	Rhapsody, Eclipse, Visual Studio, C Builder, Lab Windows CVI, Borland Delphi, Microchip MPLAB, MATLAB / SIMULINK.
Databases	MS SQL Server, ActiveX Data Objects (ADO), MySQL, PostgreSQL.

Languages

English	Advanced
German	Advanced
French	Beginner
Romanian	Mother tongue