Cristian Axenie

IT Software Infrastructure Lab
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Employment

Senior Research Engineer
Artificial Intelligence and Machine Learning in Big Data
Huawei German Research Center, Germany   2017 - present

Head of Laboratory / Principal Investigator
Artificial Intelligence and Machine Learning for Virtual Reality
AUDI Konfuzius-Institut Ingolstadt, Germany   October 2017 - present

Lecturer
Artificial Intelligence and Machine Learning
Technische Hochschule Ingolstadt, Germany   October 2017 - present

Software Engineer
Embedded Linux Development
WindRiver (Intel), Galati, Romania   July 2009 - July 2011

Software Engineer (intern)
Multi-core Digital Signal Processors (DSP)
Freescale Semiconductor (NXP), Bucharest, Romania   July - October 2008

Consultant for startup companies
Applied Artificial Intelligence and Machine Learning   2016 - present

Education

Postdoctoral Researcher
Neuroscientific System Theory Group
Neuroengineering Competence Center
Technische Universität München, Germany   May 2016 - April 2017

Doctor of Engineering (Dr. Eng. Univ.)
Neuroscience and Robotics (**Summa cum Laude**)
Synthesis of Distributed Cognitive Systems:
Interactive Computational Maps for Multisensory Fusion
Technische Universität München, Germany   October 2011 - April 2016
Advisor: Prof. Dr. Jorg Conradt (KTH Stockholm)

Master of Science (M.Sc.)
Advanced Control Engineering and Robotics (**top 1%**)
Electrical and Electronics Engineering Faculty,
Dunărea de Jos University (UGAL), Galați, Romania   October 2009 - June 2011
Advisor: Prof. Dr. Razvan Solea (University of Galati)

Bachelor of Science (B.Sc.)
Automation and Industrial Informatics (**top 1%**)
Computer Science Faculty,
Dunărea de Jos University (UGAL), Galați, Romania   October 2005 - June 2009
Advisor: Prof. Dr. Alexandru Stancu (University of Manchester)

Teaching experience

University teaching

Lecturer
Artificial Intelligence and Machine Learning
Technische Hochschule Ingolstadt, Germany   WS 2017 - SS 2019

Instructor
Computational Neuroengineering Practical
Brain Computer Interface Robot Control
Technische Universität München, Germany   WS 2016

Teaching Assistant
Computational Intelligence
Technische Universität München, Germany   WS 2011 - WS 2016

Teaching Assistant
Sensors and Transducers
Dunărea de Jos University (UGAL), Galați, Romania   SS 2010, SS2011

Lecturer
Assembler Programming
Dunărea de Jos University (UGAL), Galați, Romania   WS2009, WS2010

Lecturer
Digital Signal Processing
Dunărea de Jos University (UGAL), Galați, Romania   WS2009, WS2010

Research Workshops

Workgroup leader
Multisensory Integration and Neuromorphic Control for Flying Robots
CapoCaccia Cognitive Neuromorphic Engineering Workshop
Sardinia, Italy   April 2013

Workgroup leader
Universal Neuromorphic Devices and Sensors for Real-Time Mobile Robotics
Telluride Neuromorphic Cognition Engineering Workshop
Telluride, USA   July 2013
Lecturer and Instructor
Neural Learning Algorithms
Basecamp.AI Winter School
Vienna, Austria   January 2017

Workgroup leader
Motor control using Cortico - Basal Ganglia model for Robot Arm reaching tasks
Nengo Summer School at University of Waterloo
Canada   June 2016

Lecturer and Instructor
Neuromorphic Vision Sensors and Event-based Information Processing for Robotics
IEEE CIS Summer School On Neuromorphic and Cyborg Intelligent Systems
Zhejiang University, China   September 2015

Student supervision

I have supervised over **30 student's** at **Technische Universität München** between WS2011 and WS2016 on **Project Practical, Advanced Seminar, Bachelor and Master theses**. Between 2017 and 2019 I have supervised **4 Bachelor theses and 1 Master thesis** at **Technische Hochschule Ingolstadt**.

Fellowships

Awarded a BayIntAn Fellowship (5000 EUR) from **Bavarian Research Alliance** for establishing a cooperation on the development of a platform for neuromorphic sensorimotor adaptation with **ETH Zurich** and **University of California, Irvine**.   January 2017

Awarded a BayIntAn Fellowship (10000EUR) by the **Bavarian Research Alliance** for establishing a cooperation on neurorobotics with **University of Waterloo, Canada** and the **University of Manchester, UK**.   July 2016

Awarded a Leonhard Lorenz-Stiftung Fellowship (7000EUR) at **Technische Universität München** for novel ideas in neurotechnologies research.   April 2013

Awarded Research Fellowship (2500EUR) by the **Science Network of Biomimetic and Biohybrid Systems** for leading a workgroup at the CapoCaccia Cognitive Neuromorphic Engineering Workshop, Italy.   May 2013

Awarded Research Fellowship (2500EUR) by the **Science Network of Biomimetic and Biohybrid Systems** for leading a workgroup at the **Telluride Neuromorphic Cognition Engineering Workshop**, USA.   July 2013

Awarded a Bavarian Elite Research PhD Scholarship (**4 years funding, ~120.000EUR**) by the **Bavarian Ministry of Sciences, Research and the Arts**.   April 2012

Honors and awards

Awarded a nVidia GPU Grant
Neuromorphic Processing for Electric Autonomous Driving with Schanzer Racing Electric (SRE) project at Technical University of Ingolstadt.   April 2018

Awarded Outstanding Reviewer Award from **IOP Journal of Neural Engineering**   2016

Awarded 1st prize at the **Daimler Automotive Big Data Analytics Hackaton** for the design of a neuro-fuzzy learning system for adaptive anomaly detection.   April 2016

Awarded the **Microsoft Cognitive Technologies prize (500EUR)** at the **Burda Hackdays** for the development of a neural learning system for psychometric data analytics.   April 2016

Awarded 1st prize (5000EUR) at the **BMW Automotive Hackdays** for the development of an artificial intelligence learning agent for predictive maintenance.   March 2016

Awarded 4th place at the **National IBM "Best Linux Application"** programming contest for work in robot fault-tolerant control using custom embedded Linux.   September 2009

Best paper award at the **13th International Scientific Sessions Polytechnic University of Timisoara**, Romania for work on nonlinear control for mobile robots.   May 2009

Awarded University of Galati Performance Scholarship (100 EUR/month)   2006 - 2009

Selected publications

1. **C. Axenie**, Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, STARLORD: Sliding window Temporal Accumulate-Retract Learning for Online Reasoning on Datastreams, 2018 IEEE International Conference on Machine Learning and Applications (ICMLA2018).

2. D. Foroni, **C. Axenie** et al., Moira: A Goal-Oriented Incremental Machine Learning Approach to Dynamic Resource Cost Estimation in Distributed Stream Processing Systems, International Workshop on Real-Time BI and Analytics, VLDB 2018.

3. A. Becher, **C. Axenie**, T. Grauschopf, VIRTOOAIR: VIrtual Reality TOOlbox for Avatar Intelligent Reconstruction, 2018 IEEE International Symposium on Mixed and Augmented Reality (ISMAR2018).

4. I. Sugiarto, **C. Axenie**, J. Conradt, FPGA-based Hardware Accelerator for an Embedded Factor Graph with Configurable Optimization, Journal of Circuits, Systems and Computers, 2018.

5. F. Mirus, **C. Axenie**, T. C. Stewart, J. Conradt, Neuromorphic Sensorimotor Adaptation for Robotic Mobile Manipulation: From Sensing to Behaviour, Cognitive Systems Research, 2018.

6. **C. Axenie,** C. Richter, J. Conradt, A Self-Synthesis Approach to Perceptual Learning for Multisensory Fusion in Robotics, Sensors 16(10) 1751, 2017.

7. I. Sugiarto**, C. Axenie**, J. Conradt, From Adaptive Reasoning to Cognitive Factory: Bringing Cognitive Intelligence to Manufacturing Technology, International Journal of Industrial Research and Applied Engineering, 2016.

8. **C. Axenie**, J. Conradt, Learning Sensory Correlations for 3D Egomotion Estimation, Springer LNCS in Biomimetic and Biohybrid Systems, pp. 329-338, 2015.

9. I. Susnea, **C. Axenie**, Cognitive Maps for Indirect Coordination of Intelligent Agents, Studies in Informatics and Control Vol. 24, 2015.

10. **C. Axenie**, J. Conradt, Cortically inspired sensor fusion network for mobile robot egomotion estimation, Robotics and Autonomous Systems, 2014.

11. **C. Axenie**, J. Conradt, Cortically Inspired Sensor Fusion Network for Mobile Robot Heading Estimation, Intl Conf. on Artificial Neural Networks, 2013, pp. 240-47.

12. **C. Axenie**, R. Solea, Real time control design for mobile robot fault tolerant control. Introducing the ARTEMIC powered mobile robot, Mechatronics and Embedded Systems and Applications (MESA), 2010 IEEE/ASME Intl. Conf. on, 2010, pp. 7 -13.

13. **C. Axenie**, D. Cernega, Adaptive sliding mode controller design for mobile robot fault tolerant control, Robotics in Alpe-Adria-Danube Region (RAAD), 2010 IEEE 19th International Workshop on, 2010, pp. 253-59.

In review

2019

1. **C. Axenie**, Armin Becher, Daria Kurz, Thomas Grauschopf, Meta-Learning for Avatar Kinematics Reconstruction in Virtual Reality Rehabilitation, 2019 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, ECMLPKDD2019.

2. Sebastian Pohl, Armin Becher, Thomas Grauschopf, **C. Axenie**, Neural Network 3D Body Pose Tracking and Prediction for Motion-to-Photon Latency Compensation in Distributed Virtual Reality, 28th International Conference on Artificial Neural Networks, ICANN2019.

3. **C. Axenie**, Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, Streaming PCA: Towards Guarantees for Low-latency High-throughput Processing, 2019 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, ECMLPKDD2019.

4. Carlos Salort Sanchez, Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, **C. Axenie**, An Online Incremental Clustering Framework for Real-Time Stream Analytics, 2019 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, ECMLPKDD2019.

5. **C. Axenie**, Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, NARPCA: Neural Accumulate-Retract PCA for Low-latency High-throughput Processing on Datastreams, 28th International Conference on Artificial Neural Networks, ICANN2019.

Patents

1. **C. Axenie**, Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, Automatic Model Selection for Timeseries Prediction on Data Streams, 2019.

2. Radu Tudoran, **C. Axenie**, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, Online Traffic Controller with Spatio-Temporal Learning Extensions for Online Machine Learning Prediction, 2019.

3. Stefano Bortoli, Radu Tudoran, **C. Axenie**, Mohamad Al Hajj Hassan, Goetz Brasche, et al., DataBase-Embedded Streaming Engine, 2019.

4. Stefano Bortoli, Radu Tudoran, **C. Axenie**, Mohamad Al Hajj Hassan, Goetz Brasche, A System for Higher-Order Stream Processing, 2018.

5. **C. Axenie,** Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, Streaming Random Forest, 2018.

6. **C. Axenie**, Radu Tudoran, Stefano Bortoli, Mohamad Al Hajj Hassan, Goetz Brasche, Stream Feature Extractor, 2017.

Invited presentations

Invited talk at **Lions Club Salzburg** on Real-World AI and VR Applications.

February 2019

Invited talk at **Lions Club Ubersee Cyber** on AI and VR for the Future of Society.

September 2018

Invited talk at the **Institute for Cognitive System, TU Munich** on Online distributed streaming machine learning: Big Data, Fast Data, All Data.

July 2017

Invited talk at Basecamp.AI Winter School, Vienna in Neural Learning Algorithms.

January 2017

Invited talk at **TEDx - Calea Domneasca - Dare to leave a mark** in Galati, Romania on Artificial and Biological Intelligence: From Applications to Ethics.

July 2017

Media coverage in **Wired Magazine** about work on neuromorphic computation for visual rehabilitation at **Wellcome Trust Competition: Hack the Senses** in London, UK.

July 2016

Invited talk at **International Student Scientific Sessions (CERC)** of the **Romanian Military Technical Academy** for work on dual-adaptive control systems design.

June 2008

Professional service

Organizer of the **Artificial Reality Research and Cooperation Seminar**
Technische Hochschule Ingolstadt (THI),
South China University of Technology (SCUT) and
Audi Konfuzius Institute Ingolstadt.   February 2019

Program-committee member
International Conference of Artificial Neural Networks (ICANN)   2013

Reviewer
MDPI Sensor Journal, IOP Journal of Neural Engineering   2016 - present

Advisory board / Consulting
Cambridge Humanae, Soley, GoalPlay, Siemens   2016 - 2018

Professional development

Deep Learning Workshop Certificate
nVidia Deep Learning Institute, Munich, Germany   May 2017

Entrepreneurial Thinking Workshop Certificate (Prof. Breugst)
Entrepreneurship Research Institute
Technische Universität München Graduate School, Munich, Germany   December 2014

Effective Student Mentoring Workshop Certificate (Dr. Werther)
Münchner Institut für Systemische Weiterbildung (MISW)
Technische Universität München Graduate School, Munich, Germany   April 2014

Technical Writing Workshop Certificate (Prof. Diepold)
Technische Universität München Graduate School, Munich, Germany   October 2012

Designer certificate on dependable embedded systems analysis and design from University of
Luzern (Switzerland) - Prof. Erich Styger.   September 2008

Professional societies

IEEE, Computational Intelligence Society   as of 2007
Bernstein Association for Computational Neuroscience   as of 2011
Free Software Foundation   as of 2012