RAMIN HASANI

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I aim at understanding how brain gives rise to mind. I research brain-inspired machine learning and deep learning, for dynamic systems modeling, robotic control and autonomous driving.

Work Experiences

10/2017 – 12/2017

Machine Learning Visiting Research Scholar

CSAIL, Massachusetts Institute of Technology (MIT), USA

Interpretable machine learning technologies for autonomous driving and robot manipulation.

06/2016 – 10/2016

Machine learning Visiting Research Scholar

VAS Group, Imperial College London, UK

Deep recurrent nets for modeling complex analog integrated circuits

http://vas.doc.ic.ac.uk/people/

12/2015 - Present

Machine Learning PhD Research Assistant

CPS Research Devision, TU Wien, Austria

Interpretable Machine Learning

Education

12/2015 – Present

PhD in Computer Science

TU Wien, Austria

Thesis: Interpretable Recurrent Neural Networks for Modeling Dynamic Systems

09/2012 – 12/2015

M.Sc. in Electronic Engineering

Politecnico di Milano, Italy

Thesis: Design of CMOS silicon neurons for noise-assisted computations in spiking neural networks

09/2007 – 01/2012

B.Sc. in Electrical Engineering – Electronics (TOP 5)

Ferdowsi University of Mashhad, Iran

Publications

2018

Neuronal Circuit Policies
Mathias Lechner, Radu Grosu, Ramin M. Hasani.
arXiv preprint arXiv:1803.08554 (2018)

2017

Worm-level Control through Search-based Reinforcement Learning
Mathias Lechner, Radu Grosu, Ramin M. Hasani.
Deep Reinforcement Learning Symposium at the 31st Neural Information Processing Systems (**NIPS**) Conference, 2017.

A Simplified Cell Network for the Simulation of C. elegans' Forward Crawling
David Lung, Stephen Larson, Andrey Palyanov, Sergey Khayrulin, Padraig Gleeson, Manuel Zimmer, Radu Grosu and Ramin M. Hasani.
Workshop on Worm's Neural Information Processing at the 31st Neural Information Processing Systems (**NIPS**) Conference, 2017.

Searching for Biophysically Realistic Parameters for Dynamic Neuron Models by Genetic Algorithms from Calcium Imaging Recording
Magdalena Fuchs, Manuel Zimmer, Radu Grosu and Ramin M. Hasani.
Workshop on Worm's Neural Information Processing at the 31st Neural Information Processing Systems (**NIPS**) Conference, 2017.

Compositional Neural-Network Modeling of Complex Analog Circuits
Ramin M. Hasani, Dieter Haerle, Christian F. Baumgartner, Alessio R. Lomuscio and Radu Grosu.
30th International Joint Conference on Neural Networks (**IJCNN** 2017), IEEE, 2017.

SIM-CE: An Advanced Simulation Platform for Studying the brain of C. elegans
Ramin M. Hasani, Victoria Beneder, Magdalena Fuchs, David Lung, and Radu Grosu.
Workshop on Computational Biology, 34th International Conference on Machine Learning (**ICML**), 2017

Modeling a Simple Non-Associative Learning Mechanism in the Brain of C. elegans
Ramin M. Hasani, Magdalena Fuchs, Victoria Beneder, Radu Grosu.
2nd International Workshop on Biomedical Informatics with Optimization and Machine Learning (BOOM 2017), In conjunction with 26th International Joint Conference on Artificial Intelligence (**IJCAI**), 2017.

Towards Deterministic and Stochastic Computations with Izhikevich Spiking Neuron Model
Ramin M. Hasani, Guodong Wang, and Radu Grosu.
14th International Work-Conference on Artificial Neural Networks (IWANN 2017), Springer, 2017.

Computing with Biophysical and Hardware-efficient Neural Models
Konstantin Selyunin, Ramin M. Hasani, Denise Ratasich, Ezio Bartocci, and Radu Grosu.
14th International Work-Conference on Artificial Neural Networks (IWANN 2017), Springer, 2017.

An Automated Auto-encoder Correlation-based Health Monitoring and Prognostic Method for Machine Bearings
Ramin M. Hasani, Guodong Wang, Radu Grosu
arXiv:1703.06272 [cs.LG], 2017.

SIM-CE: An Advanced Simulink Platform for Studying the Brain of Caenorhabditis elegans
Ramin M. Hasani, Victoria Beneder, Magdalena Fuchs, David Lung, Radu Grosu
arXiv:1703.06270 [q-bio.NC], 2017.

Non-Associative Learning Representation in the Nervous System of the Nematode C. elegans
Ramin M. Hasani, Magdalena Fuchs, Victoria Beneder, Radu Grosu
arXiv:1703.06264 [q-bio.NC], 2017.

Control of the Correlation of Spontaneous Neuron Activity in Biological and Noise-Activated CMOS Artificial Neural Microcircuits
Ramin M. Hasani, Giorgio Ferrari, Hideaki Yamamoto, Sho Kono, Koji Ishihara, Soya Fujimori, Takashi Tanii, Enrico Prati.
arXiv:1702.07426v1 [cs.NE], 2017.

2016

Efficient Modeling of Complex Analog Integrated Circuits Using Neural Networks
Ramin M. Hasani, Dieter Haerle, and Radu Grosu.
12th Conference on Ph. D. Research in Microelectronics and Electronics (PRIME), 2016, pp. 1-4. IEEE, 2016.

Probabilistic Reachability Analysis of the Tap-Withdrawal Circuit in C. elegans
Isla, Md Ariful, Qinsi Wang, Ramin M. Hasani, Ondrej Balun, Edmund M. Clarke, Radu Grosu, and Scott A. Smolka.
18th IEEE International High Level Design Validation and Test Workshop (**HLDVT**), pp. 170-177. IEEE, 2016.

Investigations on the Nervous System of Caenorhabditis elegans
Ramin M. Hasani, Lukas Esterle, and Radu Grosu.
39th German Conference on Artificial Intelligence (**KI 2016**) – Current AI Research in Austria Workshop (CAIRA), 2016.

Organizations

Main Chair @ NIPS 2017 1st workshop on the Worm's Neural Information processing (WNIP), Long Beach, CA, USA

Meeting Attendances

CPS Week 2016, Vienna, Austria

PRIME 2016, Lisbon, Portugal

NIPS 2016, Barcelona, Spain

IWANN 2017, Cadiz, Spain

ICML 2017, Sydney, Australia

IJCAI 2017, Melbourne, Australia

Deep-Learning-Indaba 2017, Johannesburg, South Africa

NIPS 2017, Long Beach, California, USA

Current Students

Marc Javin - M.Sc. in Computer Engineering, TU Wien. Thesis Title: " A Hybrid Optimization suite for Neuronal Circuits ", Feb 2018 – Present

David Lung - M.Sc. in Computer Engineering, TU Wien. Thesis Title: "OpenWorm: Design and Evaluation of Neural Circuits on the Virtual Worm, C. elegans ", Jan 2017 – Present

Magdalena Fuchs - M.Sc. in Biomedical Engineering, TU Wien. Thesis Title "Principles of Learning and Memory in the Nervous System of C. elegans", Jan 2017 – Present

Graduated Student

Mathias Lechner - M.Sc. in Computer Engineering, TU Wien. Thesis Title: "Brain-inspired Neural Control", Oct 2016 – Oct 2017 **(Won the Best Thesis Award of 2017 at the Faculty of Informatics, TU Wien)**

Benjamin Kulnik - B.Sc. in Electrical Engineering, TU Wien. Thesis Title: "A Grid-Search Algorithm for Selecting the Optimal Structure in Deep Neural Network Models" Oct 2017 – Feb 2018

Ondrej Balún - M.Sc. in Computer Engineering, TU Wien. Thesis Title: "Towards Distributed Controllers Based on C. elegans Locomotory Neural Network ", Dec 2015 - Jan 2017.

Honors & Awards

- Microsoft Azure for Research Award Winner ($13,000), Jan 2018 [link]
- Microsoft Azure for Research Award Winner ($10,000), Nov 2017 [link]
- NIPS Award, Sponsor Scholar at the 31st Neural Information Processing Systems (NIPS) Conference, Dec 2017
- IJCAI 2017 BOOM Workshop best poster award, Aug 2017 [link]
- ICML Award, Sponsor Scholar at the 34th International Conference on Machine Learning (ICML) 2017, Aug 2017 [link]
- Microsoft Azure for Research Award Winner ($20,000), Jan 2017, [link]
- Full-time research assistant PhD position at TU Wien. (2015- present) [link]
- Member of IEEE-IES Subcommittee on Computer Vision and Human-Machine Interaction in Industrial and Factory Automation, Nov 2016 – Present, [link]
- Full M.Sc. Scholarship from Politecnico di Milano, Italy (2013 – 2015)

Languages

English	Persian	Italian	German
Full Proficiency	Mother tongue	Intermediate proficiency	Elementary

Skills

1 = Elementary | 2 = Intermediate | 3=advanced | 4=Expert

Brain Modeling 4 | Machine learning 3 | Deep Learning 3 | Recurrent neural nets 3 | Neuromorphic System Design 3 | Nonlinear System Identification 3 | Reinforcement Learning 2

MATLAB 4 | Python 2 | TensorFlow 2 | Keras 3 | C/C++ 2 | IC Design Tools 3

Interests

Brain-inspired technologies | Computational neuroscience | Physics | Neural Networks | Swimming | Video games | Traveling