Imanol Schlag

CONTACT INFORMATION

IDSIA: The Swiss AI Lab
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RESEARCH INTERESTS

Machine Learning and Artificial Neural Networks for Artificial Intelligence I'm interested in the systematic generalisation of neural networks. To this end, I'm investigating the networks ability to learn structured representations that enable algebraic compositionality.

CURRENT ACADEMIC APPOINTMENTS

Doctoral Assistant, IDSIA - The Swiss AI Lab **September 2016 to present**
Istituto Dalle Molle di Studi sull'Intelligenza Artificiale
Università della Svizzera italiana
Faculty of Informatics

EDUCATION

Università della Svizzera italiana, Lugano, Switzerland

PhD, Artificial Intelligence and Machine Learning, candidate

- Adviser: Professor Jürgen Schmidhuber
- Area of Study: Artificial Intelligence and Machine Learning

University of St Andrews, St Andrews, Scotland

MSc, Artificial Intelligence, August 2016

- *With Distinction*
- Thesis Topic: *Face Recognition from Ancient Roman Coins*
- Adviser: Professor Ognjen Arandjelović

University of Applied Sciences and Arts Northwestern Switzerland, Brugg, Switzerland

BSc, Computer Science, August 2015

- With specialisation in Information Processing and Visualization
- Thesis Topic: *Face Similarity - Finding Lookalikes from Images*

Swiss Armed Forces Special Forces Training Center, Isone, Switzerland

- Basic Training, 2010
- Non-commissioned Officer School, 2011

PUBLICATIONS

K. Irie*, I. Schlag*, R. Csordás, J. Schmidhuber. Going Beyond Linear Transformers With Recurrent Fast Weight Programmers. Preprint arXiv:2106.06295, 2021.

I. Schlag*, K. Irie*, J. Schmidhuber. Linear Transformers are Secretly Fast Weight Programmers. In Proc. Int. Conf. on Machine Learning (ICML), 2021.

I. Schlag, T. Munkhdalai, J. Schmidhuber. Learning Associative Inference Using Fast Weight Memory. In Int. Conf. on Learning Representations (ICLR), 2021.

I. Schlag, P. Smolensky, R. Fernandez, N. Jojic, J. Schmidhuber, J. Gao. Enhancing the Transformer With Explicit Relational Encoding for Math Problem Solving. Preprint arXiv:1910.06611, 2019.

I. Schlag and J. Schmidhuber. Learning to Reason with Third-Order Tensor Products. Neural Information Processing Systems, 2018.

I. Schlag and J. Schmidhuber. Gated Fast Weights for On-The-Fly Neural Program Generation. Neural Information Processing Systems, 2017. Workshop on Meta-Learning.

I. Schlag and O. Arandjelovic. Ancient Roman Coin Recognition in the Wild Using Deep Learning Based Recognition of Artistically Depicted Face Profiles. In Proc. IEEE Conference on Computer Vision and Pattern Recognition, 2017.

TEACHING EXPERIENCE

Università della Svizzera italiana, Lugano, Switzerland

Teaching Assistant **2017 to present**

- Machine Learning Fall 17/18
- Deep Learning Lab Fall 17/18, Fall 18/19, Fall 19/20, Fall 20/21
- Graph Deep Learning Spring 20/21

Course Development

- Helped to develop the first version of the Deep Learning Lab course Fall 17/18

Swiss Armed Forces, Grenadier-Battalion 30/2, Isone, Switzerland

Military Instructor and Squad Leader **2012 to 2019**

- Yearly 4 week repetition course

PROFESSIONAL EXPERIENCE

Microsoft Research, Redmond, Washington, USA

Research Internship with Paul Smolensky **June 2019 to September 2019**

Basler Kantonalbank, Basel, Switzerland

Apprentice in Informatics **September 2006 to June 2010**

AWARDS

University of St Andrews
- Medal for the best dissertation in Computer Science, 2016

NVAIL Pioneering Research Award
- For *Learning to Reason with Third-Order Tensor Products*. Received at NeurIPS, 2018.

LAST UPDATED

August 2021