KARL STELZNER

Machine Learning Researcher

stelzner@cs.tu-darmstadt.de ml-research.github.io/people/kstelzner/ github.com/stelzner

PUBLICATIONS

Structured Object-Aware Physics Prediction for Video Modeling and Planning. *Jannik Kossen*, Karl Stelzner*, Marcel Hussing, Class Voelcker, Kristian Kersting*, **ICLR 2020**. *(* equal contribution)*

- First to demonstrate robust prediction of multi-object dynamics over long timeframes based on unlabeled video data
- Novel inference architecture for joint variational training of object recognition and dynamics models
- Application to sample-efficient model-based reinforcement learning

Faster Attend-Infer-Repeat with Tractable Probabilistic Models. *Karl Stelzner, Robert Peharz, Kristian Kersting*, **ICML 2019**.

- Demonstrated how deep probabilistic models can benefit from tractable components by proposing a variant of the AIR framework for unsupervised scene understanding
- Accelerated learning by an order of magnitude by employing tractable probabilistic models, reducing the inference effort
- Awarded **best paper award** at the workshop on tractable probabilistic models at ICML 2019

Random Sum-Product Networks: a Simple but Effective Approach to Probabilistic Deep Learning. *Robert Peharz, Antonio Vergari, Karl Stelzner, Alejandro Molina, Xiaoting Shao, Martin Trapp, Kristian Kersting, Zoubin Ghahramani*, **UAI 2019.**

- Introduced an algorithm for efficiently generating and training sum-product networks with large random structures
- Achieved state-of-the-art performance on a variety of density estimation tasks, competing with sophisticated structure learners

TECHNOLOGIES / SKILLS

- Proficient in Python, Tensorflow, PyTorch
- Knowledgeable in deep learning architectures and training methods, particularly deep generative models
- Knowledgeable in probabilistic modelling and inference techniques
- Proficient in Unix, Docker
- Familiar with Java, Go, C++, R, Hadoop, Spark
- Native German speaker, near native in English

WORK EXPERIENCE

Research Associate

Machine Learning Lab, TU Darmstadt

2017 - now Darmstadt, Germany

- Principal TA for classes *Probabilistic Graphical Models* and *Introduction to AI*
- Supervising 3-4 BSc and MSc thesis projects per year

Research Assistant

AI Lab, TU Dortmund

2016 - 2017 Dortmund, Germany

- Administrated Docker based compute cluster for use in machine learning research
- Developed and deployed custom software for authentication, monitoring, and job management

EDUCATION

PhD Student

Machine Learning Lab, TU Darmstadt

Nov. 2017 - now Darmstadt, Germany

- Advisor: Kristian Kersting
- Sep./Oct. 2019: Research visit and invited talk at the University of Oxford with Adam Kosiorek and Yee Whye Teh

MSc Computer Science

TU Dortmund

Oct. 2013 - Oct. 2017 Dortmund, Germany

- Studied abroad at Butler University, Indianapolis in 2014/15
- Grade*: 1.3

BSc Computer Science

TU Dortmund

Oct. 2011 - Sep. 2013 Dortmund, Germany

- Awarded German government scholarship from 2011-2014
- Grade*: 1.4

* 1.0 is the best passing grade in Germany, 4.0 the worst