Yuhuang Hu

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Education

2017-2022 **Ph.D.**, *Institute of Neuroinformatics, UZH/ETH Zürich*, Zürich, Switzerland

2016–2017 **MScNSC**, *Institute of Neuroinformatics, UZH/ETH Zürich*, Zürich, Switzerland

2011–2015 **BCompSc**, *Department of Artificial Intelligence, Faculty of Comp Sci & Info Tech, University of Malaya*, Kuala Lumpur, Malaysia

Experience

Nov. 2023-present **Senior Machine Learning Engineer**, *LatticeFlow AG, Zürich, Switzerland*

Apr. 2022-Nov. 2023 **Senior Computer Vision Engineer**, *LatticeFlow AG, Zürich, Switzerland*

Mar. 2018-May. 2019 **Teaching Assistant**, *D-ITET, ETH Zürich, Zürich, Switzerland*
Teaching assistant of Projects & Seminars module for bachelor students. Focused on Deep Learning and Computer Vision using Raspberry Pi. (Spring semesters 2018, 2019)

Oct. 2016-Sep. 2017 **Technical Assistant**, *iniLabs GmbH, Zürich, Switzerland*
Part-time technical assistant on: Neuromorphic devices, maintenance, etc.

Oct. 2012-Jul. 2015 **Research Assistant**, *Advanced Robotic Lab, University of Malaya*
A Generalized Quantum-Inspired Decision Making Model, Deep Learning, Robotics.

Sep. 2012-Dec. 2014 **Teaching Assistant**, *Faculty of Comp Sci & Info Tech, University of Malaya*
TA for Programming I (`WXES1116`) and Data Structure (`WXES1117`).

Skills

Academic Skills
- Algorithm design and implementation, Data analysis.
- Professional in Deep Learning, Computer Vision.
- Professional in Self-supervised Learning, Event-based Learning and Processing.
- Familiar with Natural Language Processing, Acoustic Processing.

Programming Skills
- Professional in `Python` programming and development.
- Proficient at `PyTorch`, `Tensorflow`, and modern Deep Learning tools.
- Familiar with `C/C++`, `Java`, MATLAB programming.
- Familiar with modern VCS and CI/CD.

General Skills
- Quick learning and problem-solving under time constraints.
- Critical thinking and effective communication.

Languages
- **Chinese:** Native. **English:** Fluent.

Project Highlights

2021 **v2e: From Video Frames to Realistic DVS Events (Best Paper Award Finalist)**
This project introduces the `v2e` toolbox that generates realistic synthetic DVS events from intensity frames.

2020 **DDD20: End-to-End Event Camera Driving Dataset**
51h of DAVIS camera and vehicle control data collected from 4000 km of highway and urban driving. We report the first study of fusing brightness change events and intensity frame data using a deep learning approach to predict the instantaneous steering wheel angle.

2019 **Learning to Exploit Multiple Vision Modalities by Using Grafted Networks**
This project proposes a self-supervised learning method, Network Grafting Algorithm (NGA). NGA allows new vision sensors such as event camera and thermal camera to capitalize on previously pretrained powerful deep models.

2018 **Incremental Learning meets Reduced Precision Networks**
An empirical study of how reduced precision training methods impact the iCARL incremental learning algorithm. The incremental network accuracy on image datasets shows that weights can be quantized to 1 bit without severe drop in accuracy.

2017 **Understanding Iterative Estimation in Gated Neural Networks (Master Thesis)**
This thesis shows how we can overcome the vanishing gradient problem in a plain recurrent network by analyzing the gating mechanisms in Gated Neural Networks.

2016 **Max-Pooling Operations in Deep Spiking Neural Networks**
This project proposes three implementations of the max-pooling operation that result in a low performance loss during spiking neural network conversion.

Awards

Sep. 2014 Google Summer of Code 2014 (Sponsored by Google and OpenCog Organization).

Dec. 2013 *My Robot*, Cover story of Life & Times, New Straits Times (December 16).

Aug. 2013 Silver medal of HuroCup Marathon category in 18th FIRA RoboWorld Cup & Congress 2013, Kuala Lumpur, Malaysia.

Feb. 2013 Dean's List for Semester I Session 2012/2013 (Faculty of CS & IT, University of Malaya).

Websites

`https://dgyblog.com/`

`https://github.com/duguyue100`

`https://www.linkedin.com/in/duguyue100`

`https://scholar.google.com/citations?user=OpP-zUoAAAAJ&hl=en`

Selected Publications

Nov. 2023 **Citations**: 1625; **h-index**: 13; **i10-index**: 13

Main contributions

[1] **Y. Hu**, S-C. Liu, and T. Delbruck. "v2e: From Video Frames to Realistic DVS Events" in *2021 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, Virtual, 2021.

[2] **Y. Hu**, T. Delbruck, S-C. Liu, "Learning to Exploit Multiple Vision Modalities by Using Grafted Networks" in *The 16th European Conference on Computer Vision (ECCV)*, Online, 2020.

[3] **Y. Hu**, J. Binas, D. Neil, S-C. Liu, T. Delbruck, "DDD20 End-to-End Event Camera Driving Dataset: Fusing Frames and Events with Deep Learning for Improved Steering Prediction" in *The 23rd IEEE International Conference on Intelligent Transportation Systems (ITSC)*, Virtual, 2020.

[4] **Y. Hu**, T. Delbruck, S-C. Liu "Incremental Learning Meets Reduced Precision Networks" in *2019 IEEE International Symposium on Circuits and Systems (ISCAS)*, Sapporo, Japan, 2019.

[5] **Y. Hu**, A.E.G. Huber, J. Anumula, S-C. Liu, "Overcoming the vanishing gradient problem in plain recurrent networks", arXiv:abs/1801.06105, 2018.

[6] **Y. Hu**, H. Liu, M. Pfeiffer, T. Delbruck, "DVS Benchmark Datasets for Object Tracking, Action Recognition and Object Recognition", Frontiers in Neuroscience, 10:405, 2016.

Collaboration

[1] S. Wang, **Y. Hu**, S-C. Liu, "T-NGA: Temporal Network Grafting Algorithm for Learning to Process Spiking Audio Sensor Events" in *2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Singapore, 2022.

[2] I-A. Lungu, A. Aimar, **Y. Hu**, T. Delbruck, and S-C. Liu, "Siamese Networks for Few-shot Learning on Edge Embedded Devices", IEEE Journal on Emerging and Selected Topics in Circuits and Systems, 10(4):488497, 2020.

[3] Y. Gao, N.I. Nikolov, **Y. Hu**, R.H.R. Hahnloser, "Character-Level Translation with Self-attention" in *2020 Annual Conference of the Association for Computational Linguistics (ACL)*, Online, 2020.

[4] S. Wang, **Y. Hu**, J. Burgués, S. Macro, S-C. Liu, "Prediction of Gas Concentration Using Gated Recurrent Neural Networks" in *2020 2nd IEEE International Conference on Artificial Intelligence Circuits and Systems (AICAS)*, Genoa, Italy, 2020.

[5] N.I. Nikolov,**Y. Hu**, MX. Tan, R.H.R. Hahnloser, "Character-level Chinese-English Translation through ASCII Encoding" in *The Third Conference on Machine Translation (WMT18)*, Brussels, Belgium, 2018.

[6] B. Rueckauer, I-A. Lungu, **Y. Hu**, M. Pfeiffer, S-C. Liu, "Conversion of Continuous-Valued Deep Networks to Efficient Event-Driven Networks for Image Classification", Frontiers in Neuroscience, 11:682, 2017.