# Dominik Dold, M.Sc.

♔ born in Titisee-Neustadt, Germany
✉ dominik.dold@kip.uni-heidelberg.de
🌐 https://dodo47.github.io/
🎓 computational neuroscience, machine & deep learning, AI, statistics

## Work experience

| | | |
|---|---|---|
| 2016 – ···· | 🔖 | **Research Assistent.** Petrovici group for brain-inspired computing, U. Heidelberg. |
| 2017 – 2018 | 🔖 | **Guest Researcher.** Senn group for comp. neuroscience, U. Bern. |
| 2014 – 2015 | 🔖 | **Research Assistent.** Evers group for theo. quantum dynamics, MPIK Heidelberg. |

## Summer schools

| | | |
|---|---|---|
| June 2019 | 🔖 | **DS$^3$ Data Science Summer School.**<br>Five-day school co-organised by the École polytechnique & the DATAIA Institute. |
| March 2019 | 🔖 | **IRCN Course in Neuro-Inspired Computation.**<br>Invited after application. Four-day course offered by the U. Tokyo. |

## Training

| | | |
|---|---|---|
| August 2019 | 🔖 | **Team Communication – Key Roles and Intercultural Contexts Workshop.** |
| March 2019 | 🔖 | **University Leadership and Management (Epigeum).**<br>**Courses: Leadership and management, Managing people, Strategic planning.** |
| February 2019 | 🔖 | **Business management course "Grundlagenwissen BWL".** |
| October 2018 | 🔖 | **Computational Physics with GPUs.** |
| April 2017 | 🔖 | **Machine learning in science and industry.**<br>Courses offered by the Heidelberg Graduate School for Physics. |

## Skills

| | | |
|---|---|---|
| Languages | 🔖 | very good writing, reading and communication skills in english |
| Coding | 🔖 | Python & tensorflow, Matlab, Mathematica, C(++), HTML |
| Software | 🔖 | familiar with Linux bash shell and Windows systems, version control (git), integrated testing (jenkins), job scheduler (slurm, moab) |
| Design | 🔖 | LaTeX, Microsoft Office, Microsoft Powerpoint, Inkscape, Gimp |
| Teaching | 🔖 | co-supervised one master's thesis and supervised lecture tutorials, physics experiments for students and soft skill courses for first-year students |
| Social | 🔖 | organised the Journal Club of my research group during my Ph.D. |

## Communication & presentation skills

### Selected talks

| | | |
|---|---|---|
| 2019 | 🔖 | **Invited talk at Huawei**<br>Huawei Research Center, Hangzhou, China.<br>Invited by Dr. Yansong Chua. |

## Communication & presentation skills (continued)

> **Selected talk at Cosyne 2019**
> Cosyne Conference 2019, Lisbon, Portugal.
> Selected from submitted abstracts.

2018 **Invited talk at INI (ETH)**
ETH Institute of Neuroinformatics, Zurich, Switzerland.
Invited by Dr. João Sacramento.

> **Intel Neuromorphic Research Community (INRC) Workshop**
> Workshop, hosted by Intel, Reykjavik, Iceland.
> Invited as INRC Project Representative.

> **Neuroplasticity: From Bench to Machine Learning**
> Workshop, Institute of Advanced Studies, U. Surrey, England.
> Selected from submitted abstracts.

> **From Neuroscience to Machine Learning**
> Workshop, European Institute for Theoretical Neuroscience, France.
> Invited as a replacement for Prof. Dr. Walter Senn.

### Poster presentations

2019 **Bernstein Conference 2019** in Berlin, Germany.

**CNS Conference 2019** in Barcelona, Spain.

**DS$^3$ Data Science Summer School** in Paris, France.

**IRCN Course in Neuro-Inspired Computation** in Tokyo, Japan.

2018 **Bernstein Conference 2018** in Berlin, Germany.

**EMBO Dendrites Workshop 2018** in Heraklion, Greece.

2017 **Bernstein Conference 2017** in Göttingen, Germany.

**CNS Conference 2017** in Antwerp, Belgium.

## Awards

2019 First prize in the finals of the 2019 International Collegiate Competition for Brain-Inspired Computing (ICCBC 2019) at Tsinghua University in Beijing, China.

## Education

2016 – · · · · **Dr. rer. nat., Heidelberg Graduate School for Physics, Germany.**

2014 – 2016 **M.Sc. in Physics, Heidelberg University, Germany.**
Thesis title: *Stochastic Computation in Spiking Neural Networks Without Noise.*

2010 – 2014 **B.Sc. in Physics, Heidelberg University, Germany.**
Thesis title: *Energy Conservation in Fano Spectral Line Shape Control.*

2001 – 2010 **Abitur, Gymnasium am Romäusring, Villingen-Schwenningen.**

# Research publications, theses & proposals

## Journal articles and preprints

**1** Senn*, W., **Dold*, D.**, Binas, J., Schindler, K., Bengio, Y., Sacramento, J. & Petrovici, M. A. (2019). Lagrangian dynamics of dendritic microcircuits enables real-time error backpropagation across cortical areas. *in prep.*

**2** **Dold*, D.**, Bytschok*, I., Kungl, A. F., Baumbach, A., Breitwieser, O., Senn, W., … Petrovici*, M. A. (2019). Stochasticity from function – why the bayesian brain may need no noise. *Neural Networks*, *119*, 200–213. doi:https://doi.org/10.1016/j.neunet.2019.08.002

**3** Kungl, A. F., Schmitt, S., Klähn, J., Müller, P., Baumbach, A., **Dold, D.**, … Kleider, M. et al. (2019). Accelerated physical emulation of bayesian inference in spiking neural networks. *Frontiers in Neuroscience*, *13*, 1201.

**4** Bytschok*, I., **Dold*, D.**, Schemmel, J., Meier, K. & Petrovici*, M. A. (2017). Spike-based probabilistic inference with correlated noise. *arXiv:1707.01746 preprint*.

## Theses

**1** Zenk, M. (2018). *Spatio-temporal predictions with spiking neural networks*. Master's thesis, co-supervised by **Dold, D.** Heidelberg University.

**2** **Dold, D.** (2016). *Stochastic computation in spiking neural networks without noise*. Master's thesis. Heidelberg University.

**3** **Dold, D.** (2014). *Energy conservation in fano spectral line shape control*. Bachelor thesis. Heidelberg University.

## Proposals

**1** Jordan, J., **Dold, D.**, Petrovici, M. A. & Senn, W. (2018). Real-time error-backpropagation for deep cortical microcircuits in spiking neuromorphic systems. Intel INRC grant.

# References

**Prof. Dr. Walter Senn**
Department of Physiology, University of Bern
Bühlplatz 5, CH-3012 Bern
☎ +41 31 631 8721
✉ senn@pyl.unibe.ch

**apl. Prof. Dr. Jörg Evers**
Max Planck Institute for Nuclear Physics
Saupfercheckweg 1, D-69117 Heidelberg
☎ +49 6221 516 177
✉ joerg.evers@mpi-hd.mpg.de

**Prof. Dr. Andreas Mielke**
Institute for Theoretical Physics
Philosophenweg 19, D-69120 Heidelberg
☎ +49 6221 549431
✉ mielke@tphys.uni-heidelberg.de

**Dr. Mihai A. Petrovici**
Department of Physiology, University of Bern
Bühlplatz 5, CH-3012 Bern
☎ +41 31 631 8718
✉ petrovici@pyl.unibe.ch

CV layout adjusted from the Overleaf template by LianTze Lim (liantze@gmail.com).

3 / 3