Shell Xu Hu

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Research Interests

Machine learning — Variational inference, Bayesian deep learning, information-theoretical deep learning, meta-learning, interpretability, robustness, structured prediction etc.

Computer vision — Semantic segmentation, Object detection, image generation, low-level vision etc.

Interdisciplinarity — Climate change, computational biology etc.

Experience

2020.5–now **Postdoc**, *Max-Planck-Institute Tübingen and Baylor College of Medicine*, NINAI.

2019.7–2020.4 **Postdoc**, *Katholieke Universiteit Leuven*, Belgium.

2015.3–2019.12 **PhD in Machine Learning and Computer Vision**, *École des Ponts ParisTech*, France.

2018.5–2018.10 **Applied Scientist Intern**, *Amazon Cambridge*, UK.

2012.9–2015.3 **Master in Computer Science**, *Oregon State University*, USA.

2011.9–2012.9 **Master in Computer Vision and Artificial Intelligence**, *Universitat Autonòma de Barcelona*, Spain.

2006.9–2010.7 **Bachelor in Software Engineering**, *Hangzhou Dianzi University*, China.

Projects

2020.2–now **Trusty AI**, *with Yingyi Chen and Johan Suykens*.

2019.11–now **Information-theoretical deep learning**, *with Zhenwen Dai and Johan Suykens*.

2018.5–2019.12 **Information bottleneck and Bayesian meta-learning**, *with Andreas Damianou, Pablo G. Moreno, Xi Shen, Yang Xiao and Guillaume Obozinski*.

2018.6–2018.11 **Transfer learning via variational information distillation**, *with Sungsoo Ahn, Zhenwen Dai, Andreas Damianou and Neil D. Lawrence at Amazon*.

2015.10–2018.4 **New optimization algorithms for probabilistic graphical models**, *with Guillaume Obozinski and Nikos Komodakis at École des Ponts*.

2013.7–2015.5 **Probabilistic image segmentation**, *with Chris Williams and Sinisa Todorovic at Oregon State University*, paper,code.

2014.5–2014.10 **Structured output learning with approximate inference**, *with Jiaolong Xu in Google Summer of Code 2014*, ipython notebook.

2013.5–2013.10 **Large-scale learning of general structured output models**, *with Patrick Pletscher in Google Summer of Code 2013*, ipython notebook.

2012.11–2015.3 **Next generation phenomics for tree of life**, *with Sinisa Todorovic and Tom Dietterich at Oregon State University*, project webpage.

2011.10–2012.9 **Towards real-time part-based pedestrian detection**, *with Marco Pedersoli and Jordi Gonzalez at Universitat Autonòma de Barcelona*, paper, code.

Academic Services

2013–2019 **Reviewer**, *NeurIPS, ICML, ICLR, CVPR, ICCV, ECCV, ACCV, BMVC*.

Teaching

Fall 2015 **Teaching Assistant**, *Probabilistic Graphical Models*, MVA, ENS Cachan.

Fall 2011 **Teaching Assistant**, *Fundamentals of Informatics*, UAB.

Papers

- S. X. Hu, P. G. Moreno, Y. Xiao, X. Shen, G. Obozinski, N. D. Lawrence, A. Damianou, **Empirical Bayes Transductive Meta-Learning with Synthetic Gradients**, ICLR 2020.
- Z. Luo, S. X. Hu, L. Wang, Y. Lu, **Measurement of large, discontinuous displacement from digital images**, Strain 2020.
- S. X. Hu, P. G. Moreno, X. Shen, Y. Xiao, N. D. Lawrence, G. Obozinski, A. Damianou, **Empirical Bayes Meta-Learning with Synthetic Gradients**, NeurIPS-MetaLearn 2019.
- S. Ahn, S. X. Hu, A. Damianou, N. D. Lawrence, Z. Dai, **Variational Information Distillation for Knowledge Transfer**, CVPR 2019.
- S. X. Hu, S. Zagoruyko and N. Komodakis, **Exploring Weight Symmetry in Deep Neural Networks**, CVIU 2019.
- S. X. Hu, P. G. Moreno, A. Damianou, N. D. Lawrence, **beta-BNN: A Rate-Distortion Perspective on Bayesian Neural Networks** , NeurIPS-BDL 2018.
- S. Ahn, S. X. Hu, A. Damianou, N. D. Lawrence, Z. Dai, **Variational Mutual Information Distillation for Transfer Learning** , NeurIPS-CL 2018.
- S. X. Hu, G. Obozinski, **SDCA-Powered Inexact Dual Augmented Lagrangian Method for Fast CRF Learning**, AISTATS 2018.
- S. X. Hu, C. K. I. Williams and S. Todorovic, **Tree-Cut for Probabilistic Image Segmentation**, Posted on arXiv 11 June 2015.
- M. Pedersoli, S. X. Hu, J. Gonzalez and X. Roca, **Towards a Real-Time Pedestrian Detection based only on Vision**, IEEE Transactions on Intelligent Transportation System, 2014.
- S. X. Hu, M. Lam, S. Todorovic, T. G. Dietterich, A. Cirranello, P. Velazco, N. Simmons, M. O'Leary, **Zero-Shot Learning and Detection of Teeth in Images of Bat Skulls**, ICCV Workshop on Computer Vision for Accelerated Bioscience, 2013.
- M. Q. Lam, J. R. Doppa, S. X. Hu, A. Reft, S. Todorovic, T. G. Dietterich, M. Daly, **Learning to Detect Basal Tubules of Nematocysts in SEM Images**, ICCV Workshop on Computer Vision for Accelerated Bioscience, 2013.

- J. Xu, S. Ramos, S. X. Hu, D. Vázquez and A. M. López, **Multi-task Bilinear Classifiers for Visual Domain Adaptation**, NIPS Workshop on New Directions in Transfer and Multi-Task: Learning Across Domains and Tasks, 2013.
- S. X. Hu, C. Jiang, W. Zhang, J. Zhang, R. Yu, C. Lv, **An Event Based GUI Programming Toolkit for Embedded System**, APSCC, 2010.