

Shell Xu Hu

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🌐 <https://hushell.github.io>

Research Interests

Machine learning	Variational inference, Bayesian deep learning, information-theoretical deep learning, meta-learning, interpretability, causal inference, structured prediction.
Computer vision	Semantic segmentation, representation learning, image generation.
Interdisciplinarity	Climate change, computational biology.

Education

2015.3–2019.12	PhD in Machine Learning and Computer Vision , <i>École des Ponts ParisTech</i> , France.
2012.9–2015.3	Master in Computer Science , <i>Oregon State University</i> , USA.
2011.9–2012.9	Master in Computer Vision and Artificial Intelligence , <i>Universitat Autònoma de Barcelona</i> , Spain.
2006.9–2010.7	Bachelor in Software Engineering , <i>Hangzhou Dianzi University</i> , China.

Projects

2019.11–now	Climate modeling with graph neural networks , with Zicheng Liu, Siqi Ma, Lu Yi, Stan ZQ. Li and Ling Li.
2019.11–now	Empirical Bayesian deep learning , with Zhenwen Dai, John Theodore Valen and Johan Suykens.
2019.7–now	Meta-learned structured prediction , with Johan Suykens and Panos Patrinos at KU Leuven.
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 Autònoma de Barcelona, [paper](#), [code](#).

Jobs

- 2018.6–2018.9 **Applied Scientist Intern**, Amazon Cambridge.
- 2010.7–2011.7 **Research Engineer**, Grid and Service Computing Lab, Hangzhou Dianzi University.

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.
- 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.