Hongyu Su (PhD)

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Contact Information

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Expertise

. Machine learning / Optimization research
. Structured output prediction
. Large-scale data analysis
. Kernel methods for complex data structure
. Algorithmic data analysis / Bioinformatics / Recommender system

Programming Skills

. Proficient in Python, C, Matlab, Bash, R
. Experienced with Spark, Hadoop, SQL, JavaScript, Tableau
. Developed software packages are available from my Github

Educations

PhD Department of Computer Science, **Aalto University**, Finland **2012.02 - 2015.03**

- GPA: 4.5/5
- Dissertation: Multilabel Classification through Structured Output Learning [original]

MSc Department of Computer Science, **University of Helsinki**, Finland **2008.09 - 2010.09**

- Major: 5/5, Minor: 4/5, Thesis: Eximia Cum Laude Approbatur (5/5)
- Thesis: Multilabel Classification of Drug-like Molecules [original]

BEng Department of Computer Science, **Xidian University**, China **2003.08 - 2007.06**

- GPA: 86/100, Thesis: 5/5

Employments

Postdoctoral Researcher, **HIIT & Aalto University**, Finland **2015.04 - Now**

- Machine learning methods for large-scale structured data,

Doctoral Candidate, **HIIT & Aalto University**, Finland **2012.02 - 2015.03**

- Multilabel classification through structured output learning

Research Assistant, **University of Helsinki & HIIT**, Finland **2009.05 - 2012.01**

- Large scale sequencing data analysis with Technical Research Centre of Finland (VTT)
- Structured output learning and kernel methods for classifying small graphs

Fundings and Awards

. Chinese government award for outstanding doctoral students (top 500 students world wide) **2014**
. Fully funded position from Helsinki Doctoral Programme in Computer Science (HeCSE) **2011 - 2014**
. Master thesis grant from Center of Excellence Grant 118653 ALGODAN **2010**
. International Master's Degree Student Award, University of Helsinki **2008**

Selected Projects and Softwares

. Top 5% in Facebook challenge of fraud detection in online bidding platform [Github] **2015**
. Best hack in Aalto University Data Science Hackathon with a 'sport route recommender' [Github] **2015**
. Machine learning for transporter protein classification [Github] **2015**
. Newton methods combining multiple updates for RTA (L2RTA) [Github] **2014**
. Random tree approximation (RTA) for structured output learning on complete graph [Github] **2014**
. Structured output prediction of network response (SPIN) for social network analysis [Github] **2013**
. Graph kernels and multiple kernel learning for classifying small graphs [Github] **2012**

Refereed Journal Publications

. **Hongyu Su**, Juho Rousu. Multilabel Classification through Random Graph Ensembles. ***Machine Learning***, Volume 99, Issue 2 (2015), Page 231-256, DOI: 10.1007/s10994-014-5465-9. [original][preprint]

Refereed Conference Publications

. Mario Marchand, **Hongyu Su**, Emilie Morvant, Juho Rousu, John Shawe-Taylor. Multilabel Structured Output Learning with Random Spanning Trees of Max-Margin Markov Networks. In *Advances in Neural Information Processing Systems 27 (**NIPS 2014**)*, 873-881. [original]

. **Hongyu Su**, Aristides Gionis, Juho Rousu. Structured Prediction of Network Response. In *Proceedings of the* 31^{th} *International Conference on Machine Learning (**ICML 2014**)*, Beijing, China, Journal of Machine Learning Research W&CP Volume 32:442-450, June 2014. [original]

. **Hongyu Su**, Juho Rousu. Multilabel Classification through Random Graph Ensembles. In *Proceedings of the* 5^{th} *Asian Conference on Machine Learning (**ACML 2013**)*, Canberra, Australia, 2013. Journal of Machine Learning Research W&CP Volume 29:404-418, November 2013. [original]

. **Hongyu Su**, Juho Rousu. Multi-task Drug Bioactivity Classification with Graph Labeling Ensembles. In *Proceedings of the* 6^{th} *International Conference on Pattern Recognition in Bioinformatics (**PRIB 2011**)*, Delft, The Netherlands, 2011. Springer Lecture Note in Bioinformatics Volume 7035:157-167, November 2011. [original]

. **Hongyu Su**, Markus Heinonen, Juho Rousu. Structured Output Prediction of Anti-Cancer Drug Activity. In *Proceedings of the* 5^{th} *International Conference on Pattern Recognition in Bioinformatics (**PRIB 2010**)*, Nijmegen, The Netherlands, 2010. Springer Lecture Note in Bioinformatics Volume 6282:38-49, September 2010. [original]

. Anguo Dong, Lin Gao, XiaoFeng Zhou, **Hongyu Su**. An Algebra Approach for Finding Frequent Subgraphs with Hamiltonian Cycle. In *Proceedings of the* 4^{th} *International Conference on Fuzzy Systems and Knowledge Discovery (**FSDK 2007**)*, Hainan, China, 2007. IEEE Computer Society Volume 4:288-292, August 2007. [original]

Refereed Workshop Publications

. **Hongyu Su**, Aristides Gionis, Juho Rousu. Extended abstract: Structured Prediction of Network Response. In *the **ECML 2014 workshop** of Multi-Target Prediction.*

. **Hongyu Su**, Juho Rousu. Multilabel Classification via Random Graph Labeling. In *the* 5^{th} *International Conference on Artificial Intelligence and Statistics (**AISTATS 2012**).*

. **Hongyu Su**, Juho Rousu. Random Graph Ensembles in Multilabel Classification. In *the **ICML 2012 Workshop** of Object, Functional and Structured data: towards Next Generation Kernel-based Methods.* [original]

. **Hongyu Su**, Markus Heinonen, Juho Rousu. Multilabel prediction of drug activity. In *the* 4^{th} *International Workshop on Machine Learning in Systems Biology (**MLSB 2010**)*, MLSB:67-70, 2010. [original]

. **Hongyu Su**, Markus Heinonen, Juho Rousu. Multilabel Classification of Drug-like Molecules via Max-Margin Conditional Random Fields. In *Proceedings of the* 5^{th} *European Workshop on Probabilistic Graphical Models (**PGM 2010**)*, HIIT:265-273, 2010. [original]

Reviews

. The 29^{th} Conference on Advances in Neural Information Processing Systems (**NIPS 2015**).

. IEEE Transactions on Knowledge and Data Engineering (**TKDE**).

. IEEE Transactions on Neural Networks and learning Systems (**TNNLS**).

. The 6^{th} ACM International Conference on Web Search and Data Mining (**WDSM 2013**).

. The 26^{th} Conference on Advances in Neural Information Processing Systems (**NIPS 2012**).

Research Visits

. **Prof. Mario Marchand**, Laval University, Quebec City **2014.12**

. **Prof. Jinzhi Lei**, Tsinghua University, Beijing **2014.06**

. **Prof. John Shawe-Taylor**, University College London, London **2014.03**

. **Dr. Wei Bian**, University of Technology, Sydney **2013.11**

Supervision of Master Thesis

. BSc. Jane Brodie, Community detection for large-scale metagenomics data analysis **2015 - Now**

. BSc. Jinmin Lei, Graph kernels and multiple kernel learning for PPI prediction **2014 - Now**

. MSc. Nicole Althermeler, Large-scale metagenomics data analysis **2011 - 2013**