

Xinmeng Li

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Education

Ph.D. in Computer Science, *Tufts University*

Expected 2022 May

Research interest in Computational Biology

M.S. in Computer Science, *Tufts University*, GPA 3.9/4.0

2017

B.S. in Computer Science, *Sichuan University*, Top 2%

2015

Professional Experience & Internship

Experience **Tufts University**, Research Assistant & Teaching Assistant *2015 - present*

- Perform research on biochemistry data using machine learning and neural networks.
- Mentor 3 undergrad students and co-work with grad students on research projects.
- Assist teaching process on 6 graduate-level and 3 undergrad-level courses.

Internship **Food and Drug Administration**, *ORISE Fellow* *2019 Summer*

- Developed neural network models for time series regression on drug concentration.
- Design an model for precise drug analysis to facilitate drug review procedure.
- Preprocess features from various sources influencing drug concentration.

Research Projects

Deep Learning & Ensemble Modeling **Metabolite Annotation via Mass Spectra Prediction**

- Develop **ensemble** model on **GNN** and **MLP** for multi-label regression.
- Apply **attention** and **multi-tasking** to address label dependency.
- Conduct standardized **evaluation** process in training, validation and test phases.
- Improve model performance significantly by **37%** from the baseline model.

Multi-tasking & Recommender System **Enzyme-substrate Interaction Prediction**

Available at <http://github.com/HassounLab/Boost-RS>

- Develop neural network-based **recommender systems** for interaction prediction.
- Design a **general framework** for recommender systems via **multi-task learning**.
- Validate the framework by applying on multiple state-of-the-art recommender systems.

Classification & Feature selection **Antibody Sequence Analysis and Design**

Available at <http://github.com/HassounLab/ASAP-SML>

- Develop a machine learning pipeline to extract and analyze antibody features.
- Discover antibody features related to their protein structure and functionality.
- Evaluate extracted features through **random forest**, **SVM** and **AdaBoost**.

Awards

Scholarships Kerk and Janelle Loevner Graduate Fellowship, *Tufts University*

Tang Lixin Scholarship, *Tang Lixin Education Foundation*

Research Grants Student Innovative Research Grant, *Ministry of Education of China*

Programming skills

Language Proficient in Python, MATLAB, C++

Familiar with Python packages, including *Numpy*, *Pandas*, *TensorFlow*, *PyTorch*, *Keras*

Publications

- Journal Papers • **Li X**, Van Deventer JA, Hassoun S. "ASAP-SML: An Antibody Sequence Analysis Pipeline using Statistical Testing and Machine Learning." *PLoS computational biology*. 16.4 (2020).
- Invited Talk • **Li X**, Hao Z, Liu L, Hassoun S. "Exploring Improved Graph Neural Networks with Topic Modeling and Attention for Spectra Prediction." *Metabolomics Association of North America*, 2021.
- Conference Posters • **Li X**, Hao Z, Liu L, Hassoun S. "Ensemble Spectral Prediction for Metabolite Annotation." *Machine Learning in Computational Biology*, 2020.
- **Li X**, Liu L, Hassoun S. "Boost-RS: Boosted Embeddings for Recommender Systems and its Application to Enzyme-Substrate Interaction Prediction." *Machine Learning in Computational Biology*, 2020.
- **Li X**, Liu L, Hassoun S. "One-class Recommender Systems for Modeling Enzyme-substrate Interactions." *ISCB International Conference on Intelligent Systems for Molecular Biology*, 2020.
- **Li X**, Van Deventer JA, Hassoun S. "ASAP-SML: An Antibody Sequence Analysis Pipeline using Statistical Testing and Machine Learning." *ISCB International Conference on Intelligent Systems for Molecular Biology*, 2020.
- **Li X**, Van Deventer JA, Hassoun S. "Towards the Design of Matrix Metalloproteinases (MMP) Antibody Sequences." *ACM International Conference on Bioinformatics*, 2017.
- Porokhin V, **Li X**, Hassoun S. "Pathway Enrichment Analysis for Untargeted Metabolomics." *ACM International Conference on Bioinformatics*, 2017.
- Software Copyright • **Li X**, Liu L. "Volume Measurement System of Massive Material Based on Aerial Photography." *Chinese Software Copyright*, No.2014SR096344.