

# Junyuan Hong

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## Education

<b>Michigan State University (MSU)</b> <i>Ph.D. student, Computer Science and Engineering</i> Advisor: Prof. Jiayu Zhou	<b>East Lansing, USA</b> 2018.9–Now
<b>University of Science and Technology of China (USTC)</b> <i>M.E., Computer Science</i>	<b>Hefei, P.R.China</b> 2015.9–2018.6
<b>University of Science and Technology of China</b> <i>B.S., Physics, Computer Science minor</i>	<b>Hefei, P.R.China</b> 2011.9–2015.6

## Research Experience

<b>Federated Learning with Non-iid Data</b> <i>distributed learning, domain adaptation, fairness</i>	<b>2018–2020</b> ILLIDAN Lab, MSU
Facing the need of learning from non-iid data and concern of privacy, we strive to develop novel federated learning algorithms to debias and transfer knowledge between users from different groups or environment.	
○ <i>KDD'21</i> (accepted): We leverage the federated averaging of a group discriminator to transfer the critiron on locally sensed bias, such that we can debias the trained classifiers.	
○ <i>ICML'21</i> (accepted): We use a locally trained generative model to transfer the local data knowledge, which mitigate the data scacity in some user ends.	
<b>Private Learning: A Meta-Learning Method</b> <i>privacy, meta-learning, convergence analysis</i>	<b>2018–2020</b> ILLIDAN Lab, MSU
Machine learning models could be vulnerable to leaking private training information. To defend against attacks, we are designing advanced algorithms to efficiently protect data without heavily decreasing model utility.	
○ <i>AAAI'21</i> (accepted): We meta-learn to schedule the privacy-utility balance at each gradient-descent iteration such that a better final model can be trained under privacy budget constraints.	
○ <i>ArXiv</i> : We use a principled method to analyze the utility effect of privacy parameters per iteration and prove the optimal privacy-budget schedule for PL-class losses.	
<b>Data Augmentation for Subspace Data</b> <i>data augmentation, kernel method</i>	<b>2016–2018</b> USTC-Birmingham Joint Research Inst. (UBRI)
We extend the implicit data augmentation method to kernel-based classifiers through dual optimization and apply the method to classifying subspace representations of data, e.g. action videos.	
○ <i>ACM SIGKDD'18</i> (accepted as oral): We propose the Disturbance Grassmann Kernels on the Grassmann manifold by implicitly augmenting subspaces.	
<b>Model-based Kernel Method for Time Series Classification</b> <i>kernel method, time series</i>	<b>2015–2016</b> UBRI
We utilize a special type of Recurrent Neural Network, in which neural signals simulate natural spiking, to represent time series in model space for classification. As second author ( <i>ECML'16</i> ), I contribute a lot to codes and advise to apply the model to <b>event-based time series</b> .	

## Project Experience

<b>Cinema Manager System</b> <i>Software Designer and Engineer</i>	<b>2015.8</b> Works Applications (WAP), Shanghai
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(5-day internship) This project aims to design software for cinema managers, which should be efficient for their daily work. The whole internship is of English-based communication.

- Software design and documentation composing;
- Implement software using Java in one day and demonstrate it to WAP engineer;
- Get job offer from Works Applications.

### Underworld Detection Project

2014–2015

Engineer and Manager

USTC-Birmingham Joint Research Institute (UBRI)

This project aims to detect underground infrastructure by combining physics and computer technologies. Both **hardware** and **software** works are included.

- As the manager, I distribute and schedule works to teammates, achieving a stable and efficacious cooperation;
- As the engineer, I designed the 1st generation of the cable detectors with my teammates:
  - The outdoor underground cable detector;
  - The indoor cable portable detector.

## Publications

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**Junyuan Hong**, Zhangyang Wang, and Jiayu Zhou. On Dynamic Noise Influence in Differentially Private Learning. *arXiv:2101.07413 [cs]*, January 2021.

**Junyuan Hong**, Haotao Wang, Zhangyang Wang, and Jiayu Zhou. Learning model-based privacy protection under budget constraints. In *AAAI*, 2021.

**Junyuan Hong**, Zhuangdi Zhu, Shuyang Yu, Zhangyang Wang, Hiroko Dodge, and Jiayu Zhou. Federated adversarial debiasing. In *KDD*, 2021.

Zhuangdi Zhu, **Junyuan Hong**, and Jiayu Zhou. Data-free knowledge distillation for heterogeneous federated learning. In *ICML*, 2021.

Yang Li, **Junyuan Hong**, and Huanhuan Chen. Short sequence classification through discriminable linear dynamical system. *TNNLS*, 2019.

**Junyuan Hong**, Yang Li, and Huanhuan Chen. Variant grassmann manifolds: A representation augmentation method for action recognition. *TKDD*, 2019.

**Junyuan Hong**, Huanhuan Chen, and Feng Lin. Disturbance Grassmann kernels for subspace-based learning. In *KDD*, 2018.

Yang Li, **Junyuan Hong**, and Huanhuan Chen. Sequential data classification in the space of liquid state machines. In *ECML*, 2016.

## External Links

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GitHub: @jyhong836

Homepage: <https://jyhong.gitlab.io>