Xingbo Fu

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Research interests

Distributed machine learning, graph mining

Education

University of Virginia — Charlottesville, VA, USA
PhD in Computer Engineering — 2020 – Present

Xi'an Jiaotong University — Xi'an, Shaanxi, China
Master in Control Science and Engineering — 2017 - 2020

Xi'an Jiaotong University — Xi'an, Shaanxi, China
Bachelor in Automation — 2013 - 2017

Publications

Online Clustering based Fault Data Detection Method for Distributed PV Sites
Wang Shujie, Gao Feng, Wu Jiang, Zheng Chao, ***Fu Xingbo****, and Duan Fangwei.*
Chinese Control Conference (CCC, 2020).

Spatiotemporal Attention Networks for Wind Power Forecasting
Fu Xingbo*, Gao Feng, Wu Jiang, Wei Xinyu, Duan Fangwei.*
International Conference on Data Mining Workshops (ICDM 2019 Workshops).

A Simulation Approach to Multi-Station Solar Irradiance Data Considering Temporal Correlations
Fu Xingbo*, Gao Feng, Wu Jiang, Huang Ruanming, Huang Yichao, Fei Fei.*
International Conference on Innovative Smart Grid Technologies (ISGT Asia 2019).

Wind Power Capacity Planning in Enterprise's Microgrid based on Approximation Expectation of Operation Cost
Zhou Yuzhou, Zhai Qiaozhu, ***Fu Xingbo****, Guan Xiaohong, Gao Feng, Wu Jiang.*
IEEE Power & Energy Society General Meeting (IEEE PESGM 2019).

A Simulation Method of Solar Irradiance Data Based on Feature Clustering and Markov Transition Probability Matrix
Fu Xingbo*, Gao Feng, Wu Jiang, Guan Xiaohong, Li Xuan, Liu Pengyuan.*
World Congress on Intelligent Control and Automation (WCICA 2018).

Hybrid Features based K-means Clustering Algorithm for use in Electricity Customer Load Pattern Analysis
Liu Pengyuan, Yang Chenye, Wu Jiang, ***Fu Xingbo****, Huang Ruanming, Fei Fei.*
Chinese Control Conference (CCC 2018).

Research projects

Distributed machine learning system for multi-tenant clusters
Advisor: Haiying Shen — 2020 – 2021
Built up distributed machine learning system on Kubernetes for parameter server-based jobs.

Implemented Synchronous SGD and Asynchronous SGD strategies in PyTorch.
Implemented parameter server load distribution in PyTorch.
Proposed dynamic synchronization strategies for distributed training jobs.

Driver Behavior Modeling with Deep Reinforcement Learning
Advisor: Xuan Di 2019 – 2020
Modeled human-like driving behavior in car-following problems using deep reinforcement learning.
Implemented a deep deterministic policy gradient (DDPG) model and proposed the Twin Delayed Deep Deterministic policy gradient (TD3) algorithm with attention mechanism to determine driver behavior.
Evaluated performance against other baseline algorithms.

Spatiotemporal Data Prediction with Deep Learning
Advisors: Feng Gao, Jiang Wu 2017 – 2019
Proposed a framework of spatiotemporal attention networks (STAN).
Employed a multi-head self-attention mechanism to extract spatial correlations and captured temporal dependencies by Seq2Seq with a global attention mechanism.
Compared performance with seven baseline methods.

Big Data Computing Platform for Energy Internet
Advisors: Feng Gao, Jiang Wu 2017– 2019
Built up Hadoop-Spark big data computing clusters for data processing and storage.
Used Multithread Technology and TCP socket to collect data and exchange messages with computing clusters.
Received data by Spark Streaming and processed data by Spark MLlib.

Solar Irradiance Data Simulation
Advisors: Feng Gao, Jiang Wu 2017– 2019
Proposed a solar irradiance simulation method based on feature clustering and Markov transition probability matrix
Accomplished this method with solar irradiance data for one station according to state reduction.
Generalized this method to multi-station solar irradiance data.

Honors and scholarships

Graduate with Honor (10%) (Xi'an Jiaotong University)	2020
Outstanding Graduate Student (Xi'an Jiaotong University)	2019
Graduate with Honor (10%) (Xi'an Jiaotong University)	2017
Outstanding Student (Xi'an Jiaotong University)	2014, 2015, 2016
Siyuan Scholarship (Xi'an Jiaotong University)	2014, 2015, 2016