YUANXUN ZHANG

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EDUCATION

University of Missouri - Columbia, USA Sep 2013 - Present
PhD Candidate in Computer Science
Department of Electrical Engineering and Computer Science

Southwest Jiaotong University, China Sep 2002-Jue 2006
Bachelor of Engineering in Computer Science

RESEARCH INTERESTS

Probabilistic Modeling, Topic Models, Generative Models, Recommendation Systems, Natural Language Processing, Deep Learning

SKILLS

Programming Languages	Python, C/C++, Matlab, Java, R, Javascript, HTML
Software Libraries	Spark, TensorFlow, CUDA,

RESEARCH EXPERIENCE

Domain-specific Topic Model for Knowledge Discovery in Scientific Communities 2017-2018
Core Research Assistant University of Missouri

- Implement scripts to extract articles from scientific publication web sites
- Design a topic model that extends Latent Dirichlet Allocation (LDA) to automatically discover appropriate tools or datasets for particular research topics from large collections of scientific publications
- Implement inference algorithm using MCMC (Gibbs sampling)

Building a Science Gateway for MU Neuroscience Researchers using Computing Resources 2018
Core Research Assistant University of Missouri

- Apply CIPRES (a open source science gateway framework) to MU computing system for building MU science gateway
- Implement a client that runs on MU cluster and communicated with CIPRES for executing jobs on clusters when users submit jobs through CIPRES

Detect DDoS Attacks in Cloud Platforms 2017
Research Assistant University of Missouri

- Design a two-stage multi-class detection algorithm to detect and classify attacks using Xgboost

Collaborative Filtering based Recommendation System for Network Performance Expectation Management 2017
Core Research Assistant University of Missouri

- Propose a novel "Social Plane" on network performance monitoring (NPM) federations such as perfSONAR for utilizing measurement intelligence to identify and diagnose network anomaly events collaboratively

- Use the concept of collaborative filtering to find users who met similar anomaly symptoms, so that those users could share diagnosis knowledge or work collaboratively

Content-based Filtering Recommendations for Performance Bottleneck Correlation Analysis 2015-2016

Core Research Assistant University of Missouri

- Present a novel measurement recommendation scheme based on content-based filtering to help users find correlated anomaly events by recommending pertinent samples from a pool of measurements
- Use Bayesian Inference and data sanity checking to strengthen the veracity information of the recommended measurements

Federated Resource Abstractions and Workflow Management in Soybean Knowledge-Base Analytics 2015-2016

Research Assistant University of Missouri

- Design and implement a end-to-end performance monitoring system for big data application workflow (i.e., SoyKB)
- Leverage the concept of Science DMZ to separate normal internet service and big data application by using SDN controller

PCA-Based Network-wide Anomaly Event Detection and Diagnosis in perfSONAR 2014-2015

Core Research Assistant University of Missouri

- Fuse multiple paths time-series measurements and transform them using PCA
- Effectively distinguish between correlated and uncorrelated anomalies without topology information
- On the basis of PCA anomaly event detection scheme, we rank the detected events by quantifying the certainty of such detection using reputation and certainty measurements analysis, and a filter framework to prune misleading measurements

WORK EXPERIENCE

Ethernet Ring Protection Switching Protocol for FreeBSD Summer 2016

Software Developer Google Summer of Code

- Design Ethernet Ring Protection Switching (ERPS) protocol that provides sub-50ms protection and recovery switching for Ethernet traffic in a ring topology and at the same time ensuring that there are no loops formed at the Ethernet layer, which is defined in ITU-T G. 8032
- Implement the ERPS protocol in FreeBSD, so that the appliances such as pfSense and FreeNAS can be directly plugged into the ERPS network without the need to sit behind routers

Network measurements and anomaly detection platform 2013-2015

Software Developer Narada Metrics

- Develop the Adaptive Plateau Anomaly Detection algorithm, which is applied to time series measurements (such as perfSONAR measurements) for anomaly detection
- Develop the spatial and temporal correlated events analysis features

Network Transmission Software Platform 2006-2013

Software Developer Huawei Technologies Co., Ltd.

- Research and develop the Layer-2 network service and protocol software platform for network transmission devices

- Mainly work on EOS (Ethernet Over SDH), MPLS/PW Ethernet service, and layer 2 Ethernet protocols

PUBLICATIONS

[1] **Y. Zhang**, P. Calyam, S. Debroy, and S. S. Nuguri. Social plane for recommenders in network performance expectation management. *IEEE Transactions on Network and Service Management*, 15(1):97–111, March 2018

[2] Roshan Lal Neupane, Travis Neely, Nishant Chettri, Mark Vassell, **Zhang, Yuanxun**, Prasad Calyam, and Ramakrishnan Durairajan. Dolus: Cyber defense using pretense against ddos attacks in cloud platforms. In *ICDCN '18*, page 30. ACM, 2018

[3] Matthew Dickinson, Saptarshi Debroy, Prasad Calyam, Samaikya Valluripally, **Zhang, Yuanxun**, Ronny Bazan Antequera, Trupti Joshi, Tommi White, and Dong Xu. Multi-cloud performance and security driven federated workflow management. *IEEE Transactions on Cloud Computing*, 2018

[4] M. Dickinson, S. Debroy, P. Calyam, S. Valluripally, **Y. Zhang**, T. Joshi, and D. Xu. End-to-end security formalization and alignment for federated workflow management. In *2016 IEEE 9th International Conference on Cloud Computing (CLOUD)*, pages 59–67, June 2016

[5] Yang Liu, Saad M. Khan, Juexin Wang, Mats Rynge, **Zhang, Yuanxun**, Shuai Zeng, Shiyuan Chen, Joao V. Maldonado dos Santos, Babu Valliyodan, Prasad P. Calyam, Nirav Merchant, Henry T. Nguyen, Dong Xu, and Trupti Joshi. Pgen: large-scale genomic variations analysis workflow and browser in soykb. *BMC Bioinformatics*, 17(13):337, 2016

[6] **Y. Zhang**, S. Debroy, and P. Calyam. Network-wide anomaly event detection and diagnosis with perfsonar. *IEEE Transactions on Network and Service Management*, 13(3):666–680, Sept 2016

[7] **Y. Zhang**, S. Debroy, and P. Calyam. Network measurement recommendations for performance bottleneck correlation analysis. In *2016 IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN)*, pages 1–7, June 2016

[8] **Y. Zhang**, P. Calyam, S. Debroy, and M. Sridharan. Pca-based network-wide correlated anomaly event detection and diagnosis. In *2015 11th International Conference on the Design of Reliable Communication Networks (DRCN)*, pages 149–156, March 2015