Songyuan Li

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RESEARCH INTERESTS

- Services Computing, Cloud Computing, Edge Computing
- Quality-of-Service (QoS) Evaluation and Optimization

EDUCATION

Master of Engineering in Computer Science and Technology, Sept. 2018 – Jun. 2021
Beijing University of Posts and Telecommunications (BUPT), Beijing, P.R. China
GPA: 82/100 (By December 2020)

Bachelor of Engineering in Computer Science and Technology, Sept. 2014 – Jun. 2018
Beijing University of Posts and Telecommunications (BUPT), Beijing, P.R. China
Cumulative Overall GPA: 85/100; Major GPA: 88/100
Obtained the qualification of exam-exemption admission for postgraduates

ENGLISH PROFICIENCY

***TOEFL iBT Test**: 103 (Total)*

- Reading: 29
- Listening: 24
- Speaking: 23
- Writing: 27

RESEARCH EXPERIENCE

Research Assistant Mar. 2016 – Present
State Key Laboratory of Network and Switching Technology, BUPT

- QoS-aware service selection/composition based on service ecosystem.
- Market-oriented resource pricing, and demand allocation in cloud environments.
- QoS/QoE-aware decentralized resource management and task scheduling in IoT-edge-cloud systems.

SELECT PROJECT EXPERIENCE

Performance Evaluation and Optimization of IoT Service System based on Edge Computing Architecture Jan. 2020 – Present
National Natural Science Foundation of China (No. 61972414)

- Adopt the potential game theory to solve the edge resource allocation problem with Quality of Experience (QoE) maximization in a decentralized manner.
- Study the dynamic QoS-aware task scheduling and resource management problem in mobile edge computing, through designing an efficient optimization algorithm with LP relaxation techniques.
- *Publication(s)*: [TCCN] [PPNA]

Self-Adaptive Scheme of Software Ecosystem with Collaborative Learning among Humans, Machines and Services Oct. 2018 – Present
National Key Research and Development Program of China (No. 2018YFB1003804)

- Propose a price-incentive resource auction mechanism, with the objective of stimulating maximum users willing to purchase cloud resources.
- Design a market-oriented cloud pricing strategy which solves the resource pricing and demand allocation for revenue maximization.
- Develop a QoS-aware concurrent service selection approach, with the max-min fairness across multiple service requests achieved.
- *Publication(s)*: [TNSM] [TNSE] [ICWS'19]

QoS Evaluation Research for Large-Scale Dynamic Service Environment Mar. 2016 – Dec. 2018

National Natural Science Foundation of China (No. 61502043)

- Design queueing network models for QoS evaluation of IoT services in edge-cloud systems.
- Conduct reliability-aware QoS evaluation for recoverable IoT edge services using the modeling techniques of generalized stochastic Petri nets (GSPNs).
- *Publication(s)*: [IJWGS] [SCC'17]

Service Composition in IoT Environment Mar. 2016 – Dec. 2018

Beijing Natural Science Foundation (No. 4162042)

- Manipulate the Markov-Decision-Process-based resource allocation and task scheduling in edge computing paradigm weighing energy costs against QoS requirements.
- *Publication(s)*: [ISPA'17]

TECHNICAL SKILLS

- **Operating Systems:** Linux, Windows.
- **Programming Languages:** C/C++, Java, Python, MATLAB, LaTex.

WORK EXPERIENCE

Institute of Linguistics, Chinese Academy of Social Sciences Oct. 2018 – Jan. 2020

Beijing, P.R. China

- Develop the Android mobile app named "Pronunciation Test for Young Children" in Java which collects the test answers (i.e., voice data, and textual feedbacks) from kids, used for studying the phonological development of young children.
- Implement the application server for the Android mobile app "Pronunciation Test for Young Children" in Java, which is responsible for the release and management of test questions and answers.

CONFERENCE PUBLICATION

[ICWS'19] ***Songyuan Li,*** J. Huang, B. Cheng, L. Cui, Y. Shi. **FASS: A Fairness-Aware Approach for Concurrent Service Selection with Constraints,** *Proc. of IEEE International Conference on Web Services* (Top Conference in Services Computing), [PDF].

[SCC'17] ***Songyuan Li,*** J. Huang. **GSPN-Based Reliability-Aware Performance Evaluation of IoT Services,** *Proc. of IEEE International Conference on Services Computing*, [PDF].

[ISPA'17] ***Songyuan Li,*** J. Huang. **Energy Efficient Resource Management and Task Scheduling for IoT Services in Edge Computing Paradigm,** *Proc. of IEEE International Symposium on Parallel and Distributed Processing with Applications*, [PDF].

JOURNAL PUBLICATION

[TNSM] ***Songyuan Li,*** J. Huang, B. Cheng. **A Price-Incentive Resource Auction Mechanism Balancing the Interests Between Users and Cloud Service Provider,** IEEE Transactions on Network and Service Management, accepted on November 6, 2020, DOI: 10.1109/TNSM.2020.3036989, [PDF].

[PPNA] J. Huang, ***Songyuan Li,*** Y. Chen. **Revenue-Optimal Task Scheduling and Resource Management for IoT Batch Jobs in Mobile Edge Computing,** Peer-to-Peer Networking and Applications, vol. 13, no. 5, pp. 1776–1787, 2020, [PDF].

[IJWGS] J. Huang, ***Songyuan Li,*** Y. Chen, J. Chen. **Performance Modelling and Analysis for IoT Services,** International Journal of Web and Grid Services, vol. 14, no. 2, pp. 146-169, 2018, [PDF].

UNDER REVIEW

[TNSE] ***Songyuan Li,*** J. Huang, B. Cheng. **Resource Pricing and Demand Allocation for Revenue Maximization in IaaS Clouds: A Market-Oriented Approach,** IEEE Transactions on Network Science and Engineering, under review (1st-round decision on major revision received on November 11, 2020), [PDF].

[TCCN] ***Songyuan Li,*** J. Huang, B. Cheng. **QoE-DEER: A QoE-Aware Decentralized Resource Allocation Scheme for Edge Computing,** IEEE Transactions on Cognitive Communications and Networking, under review, [PDF].

AWARDS

- **China National Scholarship** (top 2%) **2019**
- **Outstanding Graduate Student Award of State Key Laboratory of Network and Switching Technology 2019**
- **BUPT 1st-Class Graduate Scholarship 2018, 2019, 2020**
- **BUPT Outstanding Bachelor Thesis Award** (top 3%) **Jun. 2018**
- **1st Prize in China Undergraduate Mathematical Contest in Modeling (Beijing Region) Sept. 2016**
- **BUPT 2nd-Class Undergraduate Scholarship 2017**
- **BUPT 3rd-Class Undergraduate Scholarship 2016**

SERVICES

- **Journal Reviewer:**
  - IEEE Access,
  - Behaviour & Information Technology,
  - Scientific Programming.
- **Conference Reviewer:**
  - IEEE 92nd Vehicular Technology Conference (VTC2020-Fall),
  - EAI International Conference on Collaborative Computing (CollaborateCom 2020).

* Updated: January 10, 2021.