Songyuan Li

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RESEARCH INTERESTS
- QoS Evaluation and Optimization
- Services Computing, Cloud Computing, Edge Computing

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: 81.88/100 (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: 84.94/100; Major 87.75/100
Ranked the top 20% of all students in the department

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)*: [TSC] [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.

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].

[TSC] ***Songyuan Li,*** J. Huang, B. Cheng, J. Chen. **QoE-DEER: A QoE-Aware Decentralized Resource Allocation Scheme for Edge Computing,** IEEE Transactions on Services Computing, under review (Top Journal in Services Computing), [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 3, 2021.