Xiufeng Liu *Associate Professor*

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- *Open-source software at Github:* https://github.com/xiufengliu

RESEARCH INTERESTS

The primary goal of my research is to develop fundamental concepts and new solutions for big data analysis and management related to smart energy. My current work has concentrated on three key areas: Building scalable systems for big data analysis and management in the cloud; Using statistics, data mining and machine learning technologies to extract information from big data to support decision makings; Developing synergy solutions for smart cities in the disciplines, including energy economics and modelling, climate economics and science, information and communication technologies.

EDUCATION

Aalborg University, Denmark *08/2008 – 05/2012*
PhD in Computer Science

Tsinghua University, China *09/2002 – 06/2015*
MSc in Software Engineering

Tsinghua University, China *09/1997 – 06/2001*
2nd BSc in Software Engineering

South University of Technology, China *09/1993 – 06/1997*
BSc in Polymer Material Engineering

WORK EXPERIENCE

Technical University of Denmark *10/2018 – Present*
Associate Professor/Senior Researcher, Department of Technology, Management and Economics

Technical University of Denmark *01/2017 – 09/2018*
Assistant Professor/Researcher, Department of Management Engineering

Technical University of Denmark *01/2015 – 12/2016*
Postdoc, Department of Management Engineering

University of Waterloo, Canada *01/2013 – 12/2014*
Postdoc, Department of Management Engineering

Aalborg University, Denmark *06/2012 – 12/2012*
Research Assistant, Department of Computer Science

Abo Akademic University, Finland *09/2006 – 07/2008*
Research Assistant, Department of Computer Science

GRANTS

- 2-year IBM Research Fellowship, 2013
- Best paper, The 18th International Conference on Extending Database Technology, 2015.
- 3-year PhD Research Fellowship, 2008

SUPERVISION EXPERIENCE

PhD Students

- Marco, PhD subject: Reinforcement learning for autonomous buildings, Main supervisor, 2019 – 2022
- Qianyun Wen, PhD subject in Sustainable Energy System, Co-supervisor, 2020 – 2024
- Wenjing Dai, PhD subject Data intelligence for district heating management, Main supervisor, 2019 – 2022

- Angreine Kewo, PhD subject: Benchmarking Residential Energy Consumption In Indonesia, Co-supervised with Prof. Per Severts Nielsen, 2016 – 2020.
- Catharina Wolff von Bulow, PhD subject: Statistical analysis of high impact climate projections and their economic consequences, Co-supervised with Prof. Kirsten Halsnæs, 2016 – 2020

Postdoc

- Zhibin Niu, Research subject: CVAES: Cognitive Visual Analytics for Smart Energy Systems, 1/10 2019 – 30/9 2011

Master Students

- Metadata management for data lake, 2019.
- Ontology-based Big Dimension Design for Data Warehouse, 2011
- Data Warehousing and Data Warehouse Design, 2010

TEACHING EXPERIENCE

- *42282 Smart cities*: Bachelor course at DTU, June 2020
- *42282 Smart cities (Internet of things)*: master course at DTU, fall 2019
- *42280 Smart, Connected, and Livable Cities E18*: master course at DTU, fall 2018
- *Database System*: 40 hours, Spring 2010
- *Object-oriented Programming in C#*: 75 hours, Fall 2009
- *Object-oriented Programming in C#*: 75 hours, Fall 2008
- *OOD & OOA in JAVA*: 35 hours, Spring 2009

SOFTWARE RELEASES

Github (https://github.com/xiufengliu)

1. SEGSys: An online mapping system for segmentation analysis of energy consumption, 2018.
2. CAT: A ready-to-use experiment tool for climate researchers to understand the pitfalls in adaptation decisions in behavioral economics (demo: http://35.232.120.103:8000), 2018.
3. IoTDashboard: An IoT dashboard system for collecting and visualizing indoor and outdoor climate data, 2017.
4. K-SC Clustering Algorithm on Spark, 2017.
5. CITIESData: A scalable smart city data management platform, 2017.
6. BigETL: A unified ETL platform of supporting various data processing technologies, including Spark, Hive, Hadoop, Python, Linux Shell script, etc, 2016.
7. DataGenerator-Cluster-Version: A parallel smart meter data generator on Spark, 2016.
8. SMAS: A smart meter data analytics system, 2015.
9. ETLMR: A Python-based Dimensional ETL Framework based on MapReduce, 2013.
10. All-RiTE: A Right-time ETL middle-ware Supporting Insert, Update and Delete Operations, 2013.
11. CloudETL: A Scalable Dimensional ETL for Hive, 2012.
12. 3XL: An efficient OWL/RDF Triple Store Supporting Bulk Operations, 2012.

PROJECT EXPERIENCE

The projects since Jan 2015

1. CVAES: Cognitive Visual Analytics for Smart Energy Systems, EuroTech Project, Role: Lead, Date: 1/9 2019 - 31/8 2021
2. FlexSUS: Flexibility for Smart Urban Energy Systems, Role: WP Lead, Date: 1/9 2019 -
3. EMB3Rs: User-driven Energy- Matching & Business Prospection Tool for Industrial Excess Heat / Cold Reduction, Recovery and Redistribution. EU H2020 Project, Role: WP Lead, Date: 28/9 2019 -
4. HEAT 4.0: Digitally supported Smart District Heating (Nr. 8090-00046A), Role: WP2 lead, Date: 19/3 2019 - 18/3 2022
5. FED: Flexible Energy Denmark, Role: Participant, Date: 9/4 2019 - 8/4 2023
6. IDASC: Data lake, Role: WP2 Lead, Date: 12/2018 -
7. CITIES: Centre for IT-Intelligent Energy Systems in Smart Cities, Role: participant, then WP1 lead since August 2018, Period: 01/01/2015 – 31/12/2020

8. SCA: Smart City Accelerator, Role: Participant, Period: 01/07/2017 – 31/08/2019
9. ClairCity: Citizen-led air pollution reduction in cities, Role: Participant, Period: 01/07/2017 – 31/01/2019
10. Roskilde Smart Monitoring Household project, Role: Principal Investigator, Period: 01/01/2018 – 31/12/2018
11. SciCloud: A Scientific Cloud Platform, Role: Participant, Period: 01/01/2017 – 30/06/2018
12. CTT: Carbon track and trace, Role: Participant, Period: 01/06/2015 – 31/12/2016

PROFESSIONAL SERVICES

Program Committee Member

1. International Conference on Big Data Analytics and Knowledge Discovery (DaWak, 2020 -)
2. International Conference on Mobile Systems and Pervasive Computing (MobiSPC, 2020 -)
3. International Workshop On Design, Optimization, Languages and Analytical Processing of Big Data (DOLAP, 2020 -)
4. The 1st Energy Informatics Academy conference in Asia - EIA Asia 2020
5. International conference of Internet of Things, Big Data and Security (IoTBG, 2016 –)
6. International Symposium on Internet of Ubiquitous and Pervasive Things (IUPT 2017)
7. IEEE Electrical Power and Energy Conference (EPEC 2016)

Services for Journal

1. Guest editor of Special Issue of *Buildings in the Context of Collective Energy Systems* in the Journal of Energies

Reviewer for Journals and Conferences

1. Applied Energy, Elsevier (2018 -)
2. Energy (2020)
3. Energies (2018, 2019)
4. IEEE Transactions on Smart Grid (2018, 2019)
5. Journal of Knowledge and Information Systems, Springer (2018)
6. Journal of Computer Standards & Interfaces, Elsevier (2018)
7. The 13th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES, 2018)
8. Journal of Data & Knowledge Engineering, Elsevier (DKE, 2017)
9. The VLDB Journal (VLDBJ, 2017)
10. IEEE Transaction of Big Data (2016)
11. Information Systems, Elsevier (2016, 2017)
12. IoTBG (2016 – 2018)
13. The 26th International Conference on Scientific and Statistical Database Management (SSDBM, 2014)
14. Proceedings of the VLDB Endowment (PVLDB, 2014)
15. ICDCS (2013)

PUBLICATIONS **GoogleScholar H-index: 15, i10-index: 19, Citations: 722+**

Refereed Journal Papers (* - Corresponding author)

1. B. Khan, **X. Liu**, SA. Ali, and M. Alam. Bivariate, Cluster and Suitability Analysis of NoSQL Solutions for Different Application Areas. In press in Journal of Big Data Research, 2020.
2. C.W. Bulow and **X. Liu***. CAT: A Ready-to-use Tool for Studying Climate Change Disaster Adaptation Behavior, In press in Journal of behavioral and experimental economics, 2020.
3. **X. Liu**, Z. Niu, Y. Yang, J. Wu, D. Cheng, and X. Wang. VAP: A Visual Analysis Tool for Energy Consumption Spatio-temporal Pattern Discovery (Demo). Proc. of EDBT, pp. 579-582, 2020.
4. **X. Liu**, Y. Yang, L. Li, and P.S. Nielsen. A Stochastic Model for Residential User Activity Simulation, Energies, 12(17):3326, 2019.
5. S. Khan, M. Alam, **X. Liu**, and K.A. Shakil. Big Data Technology-Enabled Analytical Solution for Quality Assessment of Higher Education Systems. International Journal of Advanced Computer Science and Applications, 10(6):292-304, 2019.

6. **X. Liu**, N. Iftikhar, H. Huo, R. Li, and P.S. Nielsen. Two Approaches for Synthesising Scalable Residential Energy Consumption Data, Journal of Future Computer Systems, vol. 95, pp. 586–600, 2019.
7. **X. Liu**, and P. S. Nielsen. Scalable Prediction-based Anomaly Detection on Smart Meter Data. Journal of Information Systems, Vol. 77, pp. 34-47, 2018.
8. P. Gianniou, **X. Liu***, A. Heller, P. S. Nielsen, and C. Rode . Clustering-based Analysis for Residential District Heating Data. Journal of Energy Conversion & Management, vol 165, pp. 840–850, 2018.
9. **X. Liu**, P. S. Nielsen, and A. Heller. CITIESData: a smart city data management framework. Journal of Knowledge and Information Systems (KAIS), 53(3): 699–722, 2017.
10. S. Khan, **X. Liu**, K. A. Shkil, and M. Alam. A Survey of Scholarly Data: From Big Data Perspective. Journal of Information Processing and Management (IPM), 53(4):923-944, 2017.
11. A. Heller, **X. Liu**, and P. Gianniou. A Science Cloud for Smart Cities Research. Energy Procedia 122: 679–684, 2017.
12. **X. Liu**, L. Golab, W. Golab, I. F. Ilyas, and S. Jin. Smart Meter Data Analytics: Systems, Algorithms and Benchmarking. ACM Transaction of Database System (TODS), 42(1), 2016.
13. **X. Liu**, P. S. Nielsen. An ICT-Solution for Smart Meter Data Analytics. Journal of Energy, 115(3):1710–1722, 2016.
14. **X. Liu**, N. Iftikhar, and P. S. Nielsen. Optimizing ETL by a Two-level Data Staging Method. International Journal of Data Warehousing and Mining (IJDWM), 12(3):32–50, 2016.
15. **X. Liu**, C. Thomsen, and T. B. Pedersen, ETLMR: A Highly Scalable Dimensional ETL Framework Based on MapReduce. TLDKS III, LNCS 7790, 8:1–31, 2013.
16. **X. Liu**, C. Thomsen, and T. B. Pedersen. MapReduce-based Dimensional ETL Made Easy (demo). PVLDB 5(12):1882–1885, 2012.
17. **X. Liu**, C. Thomsen, and T. B. Pedersen. 3XL: Supporting efficient operations on very large OWL Lite triple-stores. Journal of Information Systems, 36(4):765–781, 2011.
18. **X. Liu**. A Data Warehouse Solution for E-Government. International Journal of Research and Reviews in Applied Sciences, 4(1):120-128, 2010.
19. S. Kang and **X. Liu**. Online Model-based Testing Design Using the Qtronic Tool. Journal of Northeast Normal University (Natural Science Edition), 42(4):1–8, 2010.

Refereed Conference Papers

1. **X. Liu**, S. Bolwig, and P.S. Nielsen. SmartM: A Non-intrusive Load Monitoring Platform, Workshop of the 22nd Business Information System, pp. 1–10, 2019.
2. A. Kewo, P. Manembu, **X. Liu**, P.S. Nielsen. Statistical Analysis for Factors Influencing Electricity Consumption at Regional Level. Proc. of IEEE 7th International Conference on Power and Energy (PECon), pp. 132-137, 2018.
3. **X. Liu**, R. Li, and P. S. Nielsen. User Activity Simulation for Residential Buildings. Accepted by the 13th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES), 2018.
4. L. Liu, H. Huo, **X. Liu**, V. Palade. Recognizing Textual Entailment with Attentive Reading and Writing Operations. Proc. of the 23rd International Conference of Database Systems for Advanced Applications (DASFAA), pp. 847–860, 2018.
5. D. Ahlers, F. Kraemer, A. E. Braten, **X. Liu**, F. Anthonisen, P. Driscoll and J. Krogstie. Analysis and Visualization of Urban Emission Measurements in Smart Cities (demo). Proc. of the 21st International Conference on Extending Database Technology (EDBT), pp. 698–701, 2018.
6. A. Kewo, P. Manembu, P. S. Nielsen, and **X. Liu**. Modelling of electricity consumption in one of the Asia's most populous cities – Jakarta, Indonesia. Proc. of the 12th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES), 2017.
7. H. Huo, **X. Liu**, D. Zheng, Z. Wu, S. Yu, L. Liu. Collaborative Filtering Fusing Label Features Based on SDAE. Proc. of ICDM, pp. 223–236, 2017.
8. **X. Liu**, P. S. Nielsen, A. Heller, and P. Gianniou. SciCloud: A Scientific Cloud and Management Platform for Smart City Data. Proc. of DEXA Workshop, pp. 27–31, 2017.
9. **X. Liu**, P. S. Nielsen, and A. Heller. An ICT-based Anomaly Detection Method for Smart Meter Data. Proc. of the 12th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES), 2017.
10. N. Iftikhar, **X. Liu**, F. E. Nordbjerg, S. Danalachi, and J. H. Vollesen. A Scalable Smart Meter Data Generator Using Spark. Proc. of the 25th International Conference on Cooperative Information Systems, 2017.

11. **X. Liu**, and P. S. Nielsen. Air Quality Monitoring System and Benchmarking. Proc. of the 19th International Conference on Big Data Analytics and Knowledge Discovery (DaWaK), pp. 459–470, 2017.
12. P. Manembu, B. Welang, A. Lapu, A. Kewo, P. S. Nielsen, and **X. Liu** A Novel Smart Meter Controlling System with Dynamic IP Addresses. Proc. of the 26th IEEE International Symposium on Industrial Electronics (ISIE 2017).
13. **X. Liu**, N. Iftikhar, P. S. Nielsen, and A. Heller. Online Anomaly Energy Consumption Detection Using Lambda Architecture. Proc. of the 18th International Conference on Big Data Analytics and Knowledge Discovery (DaWaK), pp. 193–209, 2016.
14. N. Iftikhar, **X. Liu**, F. E. Nordbjerg, and S. Danalachi. A Prediction-based Smart Meter Data Generator. Proc. of the 19th International Conference of Network-based Information Systems (NBIS), 2016.
15. H. Huo, **X. Liu**, J. Li, and H. Yang. A Weighted K-AP Query Method for RSSI based Indoor Positioning. Proc. of the 27th Australasian Database Conference (ADC), pp. 150–163, 2016.
16. **X. Liu**, Per Sieverts Nielsen. Streamlining Smart Meter Data Analytics. Proc. of the 10th Conference on Sustainable Development of Energy, Water and Environment Systems, SDEWES2015.0558,1–14, 2015.
17. N. Iftikhar, **X. Liu**, and F. E. Nordbjerg. Relational-Based Sensor Data Cleansing. Proc. of 19th East-European Conference on Advances in Databases and Information Systems (ADBIS), pp. 108–118, 2015.
18. **X. Liu**, N. Iftikhar. An ETL Optimization Framework Using Partitioning and Parallelization. Proc. of the 30th ACM/SIGAPP Symposium On Applied Computing (SAC), pp. 1015–1022, 2015.
19. **X. Liu**, L. Golab, I. F. Ilyas. SMAS: A Smart Meter Data Analysis System (demo). Proc. of the 31st International Conference on Data Engineering (ICDE), pp. 1476–1479, 2015.
20. **X. Liu**, L. Golab, W. Golab, Ihab F. Ilyas. Benchmarking Smart Meter Data Analytics. Proc. of the 18th International Conference on Extending Database Technology (EDBT), pp. 385–396, 2015 **(Best Paper)**.
21. **X. Liu**, N. Iftikhar, and X. Xie, Survey of Real-time Processing Systems for Big Data. Proc. of the 18th International Database Engineering & Applications Symposium (IDEAS), pp. 356–361, 2014.
22. **X. Liu**, C. Thomsen, and T. B. Pedersen, CloudETL: Scalable Dimensional ETL for Hive. Proc. of the 18th International Database Engineering & Applications Symposium (IDEAS), pp. 195–206, 2014.
23. **X. Liu** and N. Iftkhar. Ontology-based Big Dimension modeling in Data Warehouse Schema Design, Proc. of the 12th Business Information System (BIS), pp. 75–87, 2013.
24. **X. Liu**, C. Thomsen, and T. B. Pedersen. 3XL: An Efficient DBMS-Based Triple-Store. Proc. of DEXA Workshops, pp. 284-288, 2012.
25. **X. Liu**, C. Thomsen, and T. B. Pedersen. ETLMR: A Highly Scalable Dimensional ETL Framework Based on MapReduce. Proc. of the 13th International Conference on Big Data Analytics and Knowledge Discovery (DaWaK), pp. 96–111, 2011.
26. **X. Liu**, C. Thomsen, and T. B. Pedersen. The ETLMR MapReduce-Based ETL Framework. Proc. of the 23rd Scientific and Statistical Database Management Conference (SSDBM), pp. 586–588, 2011.

Book Chapters

1. **X. Liu**, H. Huo, N. Iftikhar, and P. S. Nielsen. A Two-Tiered Segmentation Approach for Transaction Data Warehousing. In Emerging Perspectives in Big Data Warehousing, pp. 1-27, IGI Global, 2019.

Technical Reports

1. **X. Liu**, C. Thomsen, and T. B. Pedersen. ETLMR: A Highly Scalable Dimensional ETL Framework Based on MapReduce, TR-29, Department of Computer Science, Aalborg University, 2011.
2. **X. Liu**, C. Thomsen, and T. B. Pedersen. CloudETL: Scalable Dimensional ETL for Hadoop and Hive, TR-30, Department of Computer Science, Aalborg University, 2012.
3. **X. Liu**, D. Truscan, and L. Lilius. Online Testing of the ABOT Game Server Using the Qtronic Tool, Turku Centre for Computer Science, 2008.