

Stephen Lee

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RESEARCH INTERESTS

- Distributed systems, Cyber-physical systems and IoT, Big-data analytics and data-driven systems, IoT Security and privacy, Smart cities and energy.

EDUCATION

- **University of Massachusetts Amherst** Sept 2013 - Jul 2019 (expected)
Ph.D. Candidate in Computer Science (GPA : 3.92/4) *Advisor: Prof. Prashant Shenoy*
- **Chennai Mathematical Institute - Chennai** Aug 2008 - Apr 2011
M.S. in Computer Science (GPA : 8.75/10) *Advisor: Prof. Madhavan Mukund*
- **St. Stephen's College - Delhi** July 2004 - June 2007
B.S in Computer Science

WORK EXPERIENCE

- **University of Massachusetts Amherst** Research Assistant
Advisor: Prof. Prashant Shenoy *Sep 2013 - Present*
 - Thesis on "Software-defined Infrastructure for IoT-based Energy Systems".
 - Designed mechanisms and optimization techniques for distributed CPS systems.
 - Implemented data-driven systems and used machine learning techniques to model IoT data.
- **University of Waterloo** Research Scholar
Advisor: Prof. Srinivasan Keshav *Jul - Aug 2018*
 - Investigated scalability of permissioned blockchains and its applications in the energy domain.
 - Identified bottlenecks and improved the performance of Hyperledger Fabric.
- **Tata Research Development and Design Center** May 2011 - Aug. 2013
Research Associate *Pune, India*
 - Designed and implemented tools for data cleaning, data center analysis and consolidation.
 - Developed algorithms for generating application migration schedules in data centers.
 - Generated business case reports for migration to public cloud platforms such as AWS.
- **Ignite, Tata Consultancy Services** Nov 2007 — Apr 2011
Software Engineer, R&D Team *Chennai, India*
 - Developed web-based assessment tools used for administering exams to thousands of students.
 - Managed the deployment and performance testing of web-based applications.
 - Created content management system for hosting lecture videos and presentations.

INTERNSHIPS

- **Veea** June - Aug 2017
Summer Intern. Mentor: Sambit Sahu and Daniel Moreno *NYC, NY*
 - Evaluated the performance of deep learning techniques in edge computing devices.
- **Tata Interactive Systems** Jun 2005 — Jul 2005
Summer Intern *Mumbai, India*
 - Developed automation features for a content automation software.

TECHNOLOGY SKILLS

Programming Skills: Python, Java/J2EE, C, C++, Flex

Devops: AWS, Azure, Docker, Docker swarm, OpenStack

Web (Full stack): HTML/CSS, JavaScript, NodeJS, AngularJS, Ionic, MySQL, MongoDB etc.

Libraries: keras, arduino, numpy, pandas, cvxopt, scipy etc.

Misc: Hyperledger Fabric, Kafka , ESP8266, Git, SVN

HONORS AND AWARDS

- **PhD Portfolio with Distinction**, 2015. (Awarded to two PhD students per year).
- **First Prize**, Third annual HackUMass Hackathon 2015 (> 500 participants).
- **Honorable Mentions** in TechCrunch Disrupt SF Hackathon 2016.
- **Tata Consultancy Services Scholarship** for Masters education at Chennai Mathematical Institute (CMI).
- Member, Phi Kappa Phi. 2016.
- Awarded *On the Spot Award* in Tata Consultancy Services (TCS) for maintaining high availability of TCS Online Assessment Solution, a tool used for hiring thousands of employees every year.
- Semi-finalist under Promising Innovation category in Tata Innovista, a Tata Forum to showcase innovation efforts. Led an initiative for building the TCS Assessment Platform.
- Travel grant awards: SIGMETRICS 2015, ACM eEnergy 2015, CompSust 2016, ACM eEnergy 2016, ACM eEnergy 2018.

SERVICE

- **Program Committee:** GREEN 2018, 2019.
- **External reviewer:** Applied Soft Computing, IEEE Transactions on Mobile Computing (TMC), IEEE Real-Time Systems Symposium (RTSS) 2018, MMSys 2019, IoTDI 2019.

JOURNALS

- 1 Prateek Sharma, **Stephen Lee**, Tian Guo, David Irwin, and Prashant Shenoy. Managing Risk in a Derivative IaaS Cloud. In *Proceedings of IEEE Transactions on Parallel and Distributed Systems*, (TPDS '18).
- 2 David Irwin, Srinivasan Iyengar, **Stephen Lee**, Aditya Mishra, Prashant Shenoy, and Ye Xu. Enabling Distributed Energy Storage by Incentivizing Small Load Shifts. *ACM Transactions on Cyber-Physical Systems*, (ACM TCPS '17).

PUBLICATIONS

(R: UNDER REVIEW N: NOTES)

- 1 Srinivasan Iyengar, **Stephen Lee**, David Irwin, Prashant Shenoy, and Benjamin Weil. WattHome: A Data-driven Approach for Energy Efficiency Analytics at City-scale. In *Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, (KDD '18). Acceptance rate=11%
 - 2 Srinivasan Iyengar, **Stephen Lee**, Daniel Sheldon, and Prashant Shenoy. SolarClique: Detecting Anomalies in Residential Solar Arrays. In *Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies*, (ACM COMPASS '18). Acceptance rate = 34%
- N. 3 **Stephen Lee**, Prashant Shenoy, Krithi Ramamritham, and David Irwin. vSolar: Virtualizing Community Solar and Storage for Energy Sharing. In *Proceedings of the Ninth International Conference on Future Energy Systems*, (ACM e-Energy '18).

- 4 John Wamburu, **Stephen Lee**, Prashant Shenoy, and David Irwin. Analyzing Distribution Transformers at City Scale and the Impact of EVs and Storage. In *Proceedings of the Ninth International Conference on Future Energy Systems*, (ACM e-Energy '18). Acceptance rate = 21%
- 5 **Stephen Lee**, Srinivasan Iyengar, David Irwin, and Prashant Shenoy. Distributed Rate Control for Smart Solar Arrays. In *Proceedings of the Eighth International Conference on Future Energy Systems*, (ACM e-Energy '17). Acceptance rate = 33%
- 6 Akansha Singh, **Stephen Lee**, David Irwin, and Prashant Shenoy. SunShade: Enabling Software-Defined Solar-Powered Systems. In *Proceedings of the 8th ACM/IEEE International Conference on Cyber-Physical Systems*, (ICCCPS '17).
- 7 Srinivasan Iyengar, **Stephen Lee**, David Irwin, and Prashant Shenoy. Analyzing Energy Usage on a City-scale Using Utility Smart Meters. In *Proceedings of the 3rd ACM International Conference on Systems for Energy-Efficient Built Environments*, (ACM BuildSys '16). Acceptance rate = 24%
- 8 **Stephen Lee**, Srinivasan Iyengar, David Irwin, and Prashant Shenoy. Shared solar-powered EV charging stations: Feasibility and benefits. In *Proceedings of the Seventh International Green and Sustainable Computing Conference*, (IGSC '16).
- 9 Vani Gupta, **Stephen Lee**, Prashant Shenoy, Ramesh K. Sitaraman, and Rahul Urgaonkar. How to Cool Internet-scale Distributed Networks on the Cheap. In *Proceedings of the Seventh International Conference on Future Energy Systems*, (ACM e-Energy '16). Acceptance rate = 30%
- 10 **Stephen Lee**, Rahul Urgaonkar, Ramesh Sitaraman, and Prashant Shenoy. Cost Minimization Using Renewable Cooling and Thermal Energy Storage in CDNs. In *Proceedings of IEEE International Conference on Autonomic Computing*, (ICAC '15). Acceptance rate = 27%
- 11 Aditya Mishra, Ramesh Sitaraman, David Irwin, Ting Zhu, Prashant Shenoy, Bhavana Dalvi, and **Stephen Lee**. Integrating Energy Storage in Electricity Distribution Networks. In *Proceedings of the 2015 ACM Sixth International Conference on Future Energy Systems*, (ACM e-Energy '15). Acceptance rate = 24%
- 12 Prateek Sharma, **Stephen Lee**, Tian Guo, David Irwin, and Prashant Shenoy. SpotCheck: Designing a Derivative IaaS Cloud on the Spot Market. In *Proceedings of the Tenth European Conference on Computer Systems*, (EuroSys '15). Acceptance rate = 21%
- N. 13 Vani Gupta, **Stephen Lee**, Prashant Shenoy, Ramesh Sitaraman, and Rahul Urgaonkar. Towards Cooling Internet-Scale Distributed Networks on the Cheap. In *Proceedings of the 2015 ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems*, (SIGMETRICS '15). (Extended Abstract)
- R. 14 **Stephen Lee**, Srinivasan Iyengar, Menghong Feng, Prashant Shenoy and Subhransu Maji. DeepRoof: A Data-driven Approach For Solar Potential Estimation Using Rooftop Imagery. (Under Review)
- R. 15 Phuthipong Bovornkeeratiroj, Srinivasan Iyengar, **Stephen Lee**, David Irwin, Prashant Shenoy. Utility-preserving Privacy for Smart Energy Meters. (Under Review)
- R. 16 **Stephen Lee**, Prashant Shenoy, Krithi Ramamritham, and David Irwin. Virtualizing Community Solar and Storage for Energy Sharing. (Under Review)
- R. 17 Christian Gorenflo, **Stephen Lee**, Lukasz Golab, and Srinivasan Keshav. FastFabric: Scaling Hyperledger Fabric to 20,000 Transactions per Second. (Accepted)
- R. 18 Rishikesh Jha, **Stephen Lee**, Srinivasan Iyengar, Mohammad Hajiesmaili, Prashant Shenoy, David Irwin. Emission-aware Energy Storage Scheduling for a Greener Grid. (Under Review)

PATENTS

- 1 Shruti Bhattacharya, Swaminathan Natarajan, **Stephen Lee**, Arpit Mandliya, Suman Singh, Kunal Ramdasi. Evaluating Total Cost Of Ownership Based On System Design. Patent No: 1445/MUM/2013
- 2 **Stephen Lee**, Mariyam L., Makarand K., Anjali G., Rahul Kelkar, Harrick Vin. Analytical method for target state determination of datacenter having heterogeneous sub-systems. Patent No: 3521/MUM/2012
- 3 Raman Srinivasan, Priyadarshini. Sridhar, Usha Rani, Swarna Srinivasan, **Stephen Lee**, Prema Subramaniam. Personalized Content Generation. Patent Number: 574/MUM/2011

REFERENCES

Available on request.