

## SUMMARY

- ▷ Teaching assistant at School of Computing, National University of Singapore.
  - ▷ Courses taught: CS2103 - Software Engineering
  - CS2106 - Introduction to Operating Systems
  - CS4246 - AI Planning and Decision Making
- ▷ PhD candidate at School of Computing, National University of Singapore.
  - ▷ Current research: Reinforcement learning and transfer learning.
- ▷ Completed MTech at International Institute of Information Technology - Bangalore.
- ▷ Member Technical Staff in NetApp for three years as performance test engineer.

## EDUCATION

*PhD*, Computer Science  
School of Computing, National University of Singapore, Singapore  
(Expected completion: August 2018) CAP: 4.50/5

*Master of Technology*, Information Technology  
International Institute of Information Technology Bangalore, India  
(Graduation: June 2012) CGPA: 3.84/4

*Bachelor of Engineering*, Computer Science and Engineering  
Vishweshwaraiah Technological University, India  
(Graduation: 2007) Aggregate: 76.76 %

## PUBLICATIONS

## JOURNAL ARTICLES

1. Narayan, A., Pillai, P. S., Prasad, A. S., and Rao, S. (2017). Resource procurement, allocation, metering, and pricing in cloud computing. In Chaudhary, S., Somani, G., and Buyya, R., (eds), *Research Advances in Cloud Computing*, Chapter 7, Page pp. Springer, Singapore. (Book chapter)
2. Akshay Narayan and Shrisha Rao, *Power Aware Cloud Metering*. *IEEE Transactions on Services Computing* (2014), vol. 7, no. 3, pp. 440–451.
3. Paul Hershey, Shrisha Rao, Charles B. Silio Jr., and Akshay Narayan, *System of Systems for Quality of Service Observation and Response in Cloud Computing Environments*. *IEEE Systems Journal* (2015), vol. 9, no. 1, pp. 212–222.

## CONFERENCE PAPERS

1. Zhuoru Li, Akshay Narayan and Tze-Yun Leong, *An Efficient Approach to Model-based Hierarchical Reinforcement Learning*, Proceedings of the Thirty First AAAI Conference on Artificial Intelligence (AAAI-17), Feb 2017.
2. Akshay Narayan, Zhuoru Li, and Tze-Yun Leong, *SEAPoT-RL: Selective Exploration Algorithm for Policy Transfer in RL*, Proceedings of the Thirty First AAAI Conference on Artificial Intelligence (AAAI-17), Feb 2017 (extended abstract).
3. Zhuoru Li, Akshay Narayan and Tze-Yun Leong, *A Core Task Abstraction Approach to Hierarchical Reinforcement Learning*, Proceedings of the 2016 International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2016), May 2016, pp. 1411-1412 (extended abstract).
4. Paul Hershey, Charles B. Silio Jr., Akshay Narayan and Shrisha Rao, *Cloud-Based Mission Observation, Response, Exploitation (CMORE) System*, 8th Annual IEEE International Systems Conference (IEEE SysCon 2014), March 2014, pp. 317–324.

5. Akshay Narayan and Prateek Saxena, *The Curse of 140 Characters: Evaluating The Efficacy of SMS Spam Detection on Android*. Third ACM Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM '13), Berlin, Germany, November 2014, pp. 33–42.
6. Akshay Narayan, Shrisha Rao, Gaurav Ranjan and Kumar Dheenadayalan, *Smart Metering of Cloud Services*. 6th Annual IEEE International Systems Conference (IEEE SysCon 2012), Vancouver, Canada, March 2012, pp. 1–7.
7. Rajeshwari Ganesan, Santonu Sarkar and Akshay Narayan, *Analysis of SaaS Business Platform Workloads for Sizing and Collocation*. 5th International Conference on Cloud Computing (IEEE Cloud 2012), Honolulu, Hawaii, June 2012, pp. 868–875.
8. Paul C. Hershey, Shrisha Rao, Charles B. Silio Jr. and Akshay Narayan. *System of Systems to Provide Quality of Service Monitoring, Management and Response in Cloud Computing Environments*. 7th IEEE International Conference on System of Systems Engineering (SOSE 2012), Genoa, Italy, July 2012, pp. 314–320. (Received the Best Paper Award)
9. Akshay Narayan, Jaya Sreevalsan-Nair, Kelly Gaither and Bernd Hamann, *Isosurface Extraction from Hybrid Unstructured Grids Containing Pentahedral Elements*. International Conference on Information Visualization Theory and Applications-2012 (GRAPP/ IVAPP 2012), Rome, Italy 2012, pp. 660–669.

TEACHING  
EXPERIENCE

*CS2103/CS2103T Software Engineering*  
School of Computing, NUS.

Since July 2016  
Role: Head Tutor

Responsibilities:

- ▷ Deliver parts of the lecture related to project management.
- ▷ Mentor student project groups and conduct tutorials.
- ▷ Evaluate student projects, code quality and documentation.
- ▷ Review course content developed by the instructor.
- ▷ Manage all module logistics and administration.
- ▷ Manage post lecture quizzes, grading related data consolidation and student feedback.
- ▷ Develop automation scripts for code-quality grading and feedback management.
- ▷ Schedule and manage a team of undergrad tutors.
- ▷ Summary of teaching ratings:

Academic year/Semester	Average score		Department average
	CS2103	CS2103T	
AY 2016/17 - Sem 1	4.51	4.41	4.2
AY 2016/17 - Sem 2	4.3	3.9	4.0
AY 2017/18 - Sem 1	4.7	4.3	4.2

*CS2103 Software Engineering*  
School of Computing, NUS.

January 2015 to May 2015  
Role: Tutor

Responsibilities:

- ▷ Mentor student project groups (five teams, across three tutorial sessions).
- ▷ Evaluate students' weekly deliverable and mid term project.
- ▷ Grade programming assignments and project reports.

*CS2106 Introduction to Operating System*  
School of Computing, NUS.

January 2014 to May 2014  
Role: Tutor

Responsibilities:

- ▷ Conduct weekly tutorials and solve problem sets.
- ▷ On demand consultations with students.

*CS4246 AI Planning and Decision Making* August 2014 to December 2014  
*CS4246 AI Planning and Decision Making* August 2013 to December 2013  
School of Computing, NUS. Role: Tutor

Responsibilities:

- ▷ Conduct weekly tutorials.
- ▷ Grade written/programming assignments and project reports.
- ▷ Manage IVLE and develop weekly self assessment quizzes.
- ▷ Develop and improve course infrastructure.
- ▷ Evaluate new software/libraries and write their user guides for students to use during the course assignments/projects.

*CS110 Operating Systems* January 2012 to June 2012  
International Institute of Information Technology Bangalore, India. Role: TA

Responsibilities:

- ▷ Grade written and programming assignments.
- ▷ Monitor course project progress and mentoring project teams as necessary.
- ▷ Develop course infrastructure like test suite for programming assignment evaluation.

*Perl Instructor* June 2008 to July 2010  
NetApp India Private Ltd. Bangalore, India. Role: Instructor

Responsibilities:

- ▷ Develop course content for training new hires in basic Perl scripting.
- ▷ Deliver basic and advanced Perl training to colleagues across Bangalore business unit.
- ▷ Facilitate learning the internal test infrastructure.

INDUSTRY  
EXPERIENCE

EMPLOYMENT

*Member Technical Staff* June 2007 to July 2010  
NetApp India Private Ltd.

Responsibilities:

- ▷ Primarily work with NetApp's storage management suite of products called DFM.
- ▷ Design, develop and maintain the automation suite to (i) build the test infrastructure, (ii) generate and manage application load for scalability, performance and stress testing.
- ▷ Manual functional testing of products across the DFM suite.
- ▷ Automate functional regression tests.
- ▷ Define test criteria and develop test specification for products in the DFM suite.

Achievements:

- ▷ Obtained rating 2 consistently in the organization.
- ▷ Received numerous awards for execution excellence in various teams.

INTERNSHIP

*Summer Research Intern* May 2014 to August 2014  
Xerox Research Center India

Responsibilities:

- ▷ Conceptualize and develop the test-bed to simulate a crowdsourcing platform like Crowdflower or Amazon Mechanical Turk.
- ▷ Work with colleagues to test, triage bugs and enhance the product.

*Research Intern*  
Infosys Research Labs.

July 2011 to January 2012

Responsibilities:

- ▷ Develop a framework for infrastructure-side workload consolidation.
- ▷ Develop the sizing and collocation analysis tool that enables workload consolidation.

*Intern*  
Hewlett-Packard ISO Ltd.

January 2007 to May 2007

Responsibilities:

- ▷ Design and develop a toolkit to migrate data from Oracle to HP SQL/MX.
- ▷ Develop the module that maps datatypes between Oracle and SQL/MX.

PROFESSIONAL  
SERVICE

- ▷ Served as reviewer for IEEE Transactions on Services Computing (2017).
- ▷ Served as reviewer for NIPS 2016.

INTERESTS

- ▷ Passionate about teaching.
- ▷ Applying reinforcement learning/transfer learning in software testing.
- ▷ Application of data analysis and machine learning to solve interesting problems.
- ▷ “Green IT” paradigm. Previous projects:
  - ▷ Utilization based billing of cloud instances.
  - ▷ Incorporating power awareness to metering and billing of cloud services.
  - ▷ Workload (virtual machine) sizing and consolidation.

RECOGNITIONS

- ▷ Nominated for Best Full-time Teaching Assistant award for AY2016-17, SoC, NuS
- ▷ Awarded Institute Gold Medal for contribution to IITB Professional Life during the 2012 annual convocation at IITB.
- ▷ Named in Director’s merit list of June 2011 and January 2012 in IITB, (an honor conferred to students securing CGPA > 3.75/4).