

## Don TA

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## Summary Statement

My research strategy is mainly application-driven, i.e., the focus is on improving current or developing novel applications that can exploit the full potentials and expose any limitations of newly developed technologies. My background is firmly rooted in cluster and cloud computing, however, I believe that the decentralized computing model, currently made possible and popularized by blockchain technologies, will gradually take over the prevalent cloud-based, centralized model in the near future.

## Education

PhD, Nanyang Technological University, Singapore, 2006

Bachelor of Computer Engineering, Ho Chi Minh City University of Technology, Vietnam, 2001

## Skill Set

Blockchain, cloud computing, machine learning, simulations.

## Academic Appointments

Associate Professor of Computer Science (Education), School of Computing and Information Systems, SMU, Jan 2023 - Present

Assistant Professor of Computer Science (Education), School of Computing and Information Systems, SMU, Apr 2021 - Dec 2022

Assistant Professor of Information Systems (Education), School of Computing and Information Systems, SMU, Sep 2019 - Mar 2021

## Academic Administrative Positions

Faculty Manager, B.Sc. (CS) Project Experience, School of Computing and Information Systems, SMU, Jul 2021 - Present

## RESEARCH

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## Research and Project Areas

Blockchain applications, AI in education, cloud computing

## Publications

### Journal Articles [Refereed]

GraphMP: I/O-Efficient Big Graph Analytics on a Single Commodity Machine, by SUN, Peng; WEN, Yonggang; TA, Nguyen Binh Duong; XIAO, Xiaokui. (2020). *IEEE Transactions on Big Data*, 6 (4), 816-829. <https://doi.org/10.1109/TBDATA.2019.2908384> (Published)

Secure virtual machine placement in cloud data centers, by AGARWAL, Amit; TA, Nguyen Binh Duong. (2019). *Future Generation Computer Systems: The International Journal of eScience*, 100 210-222. <https://doi.org/10.1016/j.future.2019.05.005> (Published)

FC2: Cloud-based cluster provisioning for distributed machine learning, by TA, Nguyen Binh Duong. (2019). *Cluster Computing*, 22 (4), 1299-1315. <https://doi.org/10.1007%2Fs10586-019-02912-6> (Published)

MetaFlow: A Scalable Metadata Lookup Service for Distributed File Systems in Data Centers, by SUN, Peng; WEN, Yonggang; TA, Duong Nguyen Binh; XIE, Haiyong. (2018). *IEEE Transactions on Big Data*, 4 (2), 203-216. <https://doi.org/10.1109/TBDATA.2016.2612241> (Published)

Adaptive Resource Provisioning Mechanism in VEEs for Improving Performance of HLA-Based Simulations, by LI, Zengxiang; CAI, Wentong; TURNER, Stephen John; LI, Xiaorong; TA, Nguyen Binh Duong, GOH, Rick Siow Mong. (2015). *ACM Transactions on Modeling and Computer Simulation*, 26 (1), 1:1-1:25. <https://doi.org/10.1145/2717309> (Published)

Interactivity-Constrained Server Provisioning in Large-Scale Distributed Virtual Environments, by TA, Nguyen Binh Duong; NGUYEN, Thang; ZHOU, Suiping; TANG, Xueyan; CAI, Wentong; AYANI, Rassul. (2012). *IEEE Transactions on Parallel and Distributed Systems*, 23 (2), 314-312. <https://doi.org/10.1109/TPDS.2011.107> (Published)

Multi-objective zone mapping in large-scale distributed virtual environments, by TA, Duong Nguyen Binh; ZHOU, Suiping; CAI, Wentong; TANG, Xueyan; AVANI, Rassul. (2011). *Journal of Network and Computer Applications*, 34 (2), 551-561. <https://doi.org/10.1016/j.jnca.2010.12.008> (Published)

A two-phase approach to interactivity enhancement for large-scale distributed virtual environments, by TA, Duong Nguyen Binh; ZHOU, Suiping. (2007). *Computer Networks*, 51 (14), 4131-4152. <https://doi.org/10.1016/j.comnet.2007.05.002> (Published)

### Conference Proceedings

ExGen: Ready-to-use exercise generation in introductory programming courses, by TA, Nguyen Binh Duong; NGUYEN, Hua Gia Phuc; GOTTIPATI, Swapna. (2023.0). *Proceedings of the 31st International Conference on Computers in Education Conference, Matsue, Shimane, Japan, 2023 December 4-8*, (pp. 1-10) Japan: Asia-Pacific Society for Computers in Education. (Advance Online)

DronLomaly: Runtime detection of anomalous drone behaviors via log analysis and deep learning, by SHAR, Lwin Khin; MINN, Wei; TA, Nguyen Binh Duong; FAN, Jiani; JIANG, Lingxiao; LIM, Wai Kiat Daniel. (2022.0). *2022 29th Asia-Pacific Software Engineering Conference (APSEC): Virtual, December 6-9: Proceedings*, (pp. 119-128) Piscataway, NJ: IEEE. <https://doi.org/10.1109/APSEC57359.2022.00024> (Published)

AP-coach: Formative feedback generation for learning introductory programming concepts, by TA, Duong; SHAR, Lwin Khin; SHANKARARAMAN, Venky. (2022.0). *2022 IEEE International Conference on Teaching, Assessment and Learning for Engineering, Hong Kong, December 4-7: Proceedings*, (pp. 323-330) Piscataway, NJ: IEEE. <https://doi.org/10.1109/TALE54877.2022.00060> (Published)

Empirical evaluation of minority oversampling techniques in the context of Android malware detection, by

SHAR, Lwin Khin; DUONG, Ta Nguyen Binh; LO, David. (2021.0). *2021 28th Asia-Pacific Software Engineering Conference (APSEC): Taiwan, December 6-9: Proceedings*, (pp. 349-359) Los Alamitos, CA: IEEE Computer Society. <https://doi.org/10.1109/APSEC53868.2021.00042> (Published)

EtherLearn: Decentralizing learning via blockchain, by TA, Nguyen Binh Duong; YANG, Joel Tian Jun. (2021.0). *Proceedings of the IEEE TALE 2021, Wuhan, China, December 5-8*, (pp. 1-6) Wuhan, China: IEEE. (Published)

CloudNPlay: Resource optimization for a cloud-native gaming system, by WIBOWO, Angelus; TA, Nguyen Binh Duong. (2021.0). *2021 30th IEEE International Conference on Enabling Technologies: Infrastructure for Collaborative Enterprises WETICE: Bayonne, France, 27-29 October: Proceedings*, (pp. 33-38) Los Alamitos, CA: IEEE. <https://doi.org/10.1109/WETICE53228.2021.00018> (Published)

SmartFuzz: An automated smart fuzzing approach for testing SmartThings apps, by SHAR, Lwin Khin; TA, Nguyen Binh Duong; JIANG, Lingxiao; LO, David; WEI, Minn; YEO, Kiah Yong Glenn; KIM, Eugene. (2020.0). *2020 27th Asia-Pacific Software Engineering Conference (APSEC): December 1-4, Singapore: Proceedings*, (pp. 365-374) Piscataway, NJ: IEEE. <https://doi.org/10.1109/APSEC51365.2020.00045> (Published)

Hysia: Serving DNN-based video-to-retail applications in cloud, by ZHANG, Huaizheng; LI, Yuanming; AI, Qiming; LUO, Yong; WEN, Yonggang; JIN, Yichao; TA, Nguyen Binh Duong. (2020.0). *Proceedings of the 28th ACM International Conference on Multimedia, Seattle, USA, 2020, October 12-16*, (pp. 4457-4460) Seattle, USA: ACM. (Published)

Group Instance: Flexible co-location resistant virtual machine placement in IaaS clouds, by VU, Duc Long; TA, Nguyen Binh Duong. (2020.0). *2020 29th International Conference on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE): Bayonne, France, September 10-13: Proceedings*, (pp. 64-69) Los Alamitos, CA: IEEE Computer Society. <https://doi.org/10.1109/WETICE49692.2020.00021> (Published)

Decentralizing air traffic flow management with blockchain based reinforcement learning, by TA, Nguyen Binh Duong, TODI, Kumar Ketan; CHAUDHARY, Umang; TRUONG, Hong-Linh. (2019.0). *Proceedings of the 17th IEEE International Conference on Industrial Informatics, Helsinki-Espoo, Finland, 2019 July 22-25*, Helsinki-Espoo, Finland: (Published)

Automatic short answer grading using Siamese bidirectional LSTM based regression, by PRABHUDESAI, Arya; TA, Nguyen Binh Duong. (2019.0). *Proceedings of the IEEE International Conference on Engineering, Technology and Education, TALE 2019; Yogyakarta; Indonesia; April 8-11, 2019*, New York: IEEE. (Accepted)

Co-location resistant virtual machine placement in cloud data centers, by AGARWAL, Amit; TA, Nguyen Binh Duong. (2018.0). *2018 24th International Conference on Parallel and Distributed Systems (ICPADS): Singapore, December 11-13: Proceedings*, (pp. 61-68) Los Alamitos, CA: IEEE Computer Society. <https://doi.org/10.1109/PADSW.2018.8644849> (Published)

Distributed machine learning on IAAS clouds, by TA, Nguyen Binh Duong; NGUYEN, Quang Sang. (2018.0). *Proceedings of the 5th IEEE International Conference on Cloud Computing and Intelligence Systems (CCIS), Nanjing, China, 2018 November 23-25*, Nanjing, China: IEEE. <https://doi.org/10.1109/CCIS.2018.8691150> (Published)

GraphMP: an efficient semi-external-memory big graph processing system on a single machine, by SUN, Peng; WEN, Yonggang; TA, Nguyen Binh Duong; XIAO, Xiaokui. (2017.0). *Proceedings of the 23rd International Conference on Parallel and Distributed Systems (ICPADS): 2017 IEEE, Shenzhen, China, December 15-17*, (pp. 1-10) Shenzhen, China: IEEE. <https://doi.org/10.1109/ICPADS.2017.00045> (Published)

Secure virtual machine placement in infrastructure cloud services, by NATU, Varun; TA, Nguyen Binh Duong. (2017.0). *Proceedings of the 10th Conference on Service-Oriented Computing and Applications (SOCA): 2017 IEEE, Kanazawa, Japan, November 22-25*, Kanazawa, Japan: IEEE. <https://doi.org/10.1109/SOCA.2017.12> (Published)

GraphH: High performance big graph analytics in small clusters, by SUN, Peng; WEN, Yonggang; TA, Nguyen Binh Duong; XIAO, Xiaokui. (2017.0). *Proceedings of the 2017 IEEE International Conference on Cluster Computing (CLUSTER), Honolulu, USA, September 5-8*, (pp. 1-11) Honolulu, USA: IEEE. <https://doi.org/10.1109/CLUSTER.2017.51> (Published)

Towards distributed machine learning in shared clusters: A dynamically-partitioned approach, by SUN, Peng; WEN, Yonggang; TA, Nguyen Binh Duong; YAN, Shengen. (2017.0). *Proceedings of the 2017 IEEE*

*International Conference on Smart Computing (SMARTCOMP), May 29-31*, (pp. 1-6) Hong Kong: IEEE. <https://doi.org/10.1109/SMARTCOMP.2017.7947053> (Published)

Timed dataflow: Reducing communication overhead for distributed machine learning systems, by SUN, Peng; WEN, Yonggang; TA, Nguyen Binh Duong; YAN, Shengen. (2016.0). *Proceedings of the 22nd International Conference on Parallel and Distributed Systems (ICPADS): 2016 IEEE, Wuhan, China, December 13-16*, Wuhan, China: IEEE. <https://doi.org/10.1109/ICPADS.2016.0146> (Published)

Ra2: Predicting simulation execution time for cloud-based design space explorations, by TA, Nguyen Binh Duong, ZHONG, Jinghui; CAI, Wentong; LI, Zengxiang; ZHOU, Suiping. (2016.0). *Proceedings of the 20th International Symposium on Distributed Simulation and Real Time Applications (DS-RT): 2016 IEEE/ACM, London, UK, September 21-23*, (pp. 120-127) London, UK: IEEE. <https://doi.org/10.1109/DS-RT.2016.9> (Published)

Accelerating optimistic HLA-based simulations in virtual execution environments, by LI, Zengxiang; LI, Xiaorong; TA, Nguyen Binh; CAI, Wentong; TURNER, Stephen John. (2013.0). *Proceedings of the 1st ACM SIGSIM Conference on Principles of Advanced Discrete Simulation, Montréal, Québec, Canada, 2013 May 19-22*, (pp. 211-220) Montréal, Québec, Canada: ACM New York. <https://doi.org/10.1145/2486092.2486119> (Published)

QoS-aware revenue-cost optimization for latency-sensitive services in IaaS clouds, by TA, Nguyen Binh Duong; LI, Xiaorong; GOH, Rick Siow Mong; TANG, Xueyan; CAI, Wentong. (2012.0). *Proceedings of the 16th International Symposium on Distributed Simulation and Real Time Applications: 2012 IEEE/ACM, Dublin, Ireland, October 25-27*, (pp. 11-18) Dublin, Ireland: IEEE. <https://doi.org/10.1109/DS-RT.2012.11> (Published)

A framework for dynamic resource provisioning and adaptation in IaaS clouds, by TA, Nguyen Binh Duong, LI, Xiaorong; GOH, Rick Siow Mong. (2011.0). *Proceedings of the 3rd International Conference on Cloud Computing Technology and Science: 2011 IEEE, Athens, Greece, November 29 - December 1*, Athens, Greece: IEEE. <https://doi.org/10.1109/CloudCom.2011.49> (Published)

A virtualization-based approach for zone migration in distributed virtual environments, by TA, Nguyen Binh Duong; NGUYEN, Thang; NGUYEN, Tran; NGUYEN, Do; TANG, Xueyan; CAI, Wentong; ZHOU, Suiping. (2011.0). *Proceedings of the 4th International ICST Conference on Simulation Tools and Techniques: SMUTools 2011, Belgium, March 21-25*, (pp. 249-256) Belgium: ACM. <https://doi.org/10.4108/icst.simutools.2011.245557> (Published)

Efficient client-to-server assignments for distributed virtual environments, by TA, Duong Nguyen Binh; ZHOU, Suiping. (2006.0). *Proceedings of the 20th IEEE International Parallel & Distributed Processing Symposium, Rhodes Island, Greece, 2006 April 25-29*, (pp. 1-10) Rhodes Island, Greece: IEEE. <https://doi.org/10.1109/IPDPS.2006.1639288> (Published)

A dynamic load sharing algorithm for massively multiplayer online games, by TA, Nguyen Binh Duong, ZHOU, Suiping. (2003.0). *Proceedings of the 11th IEEE International Conference on Networks: ICON2003, Sydney, Australia, September 28 - October 1*, (pp. 1-6) Sydney, Australia: IEEE. <https://doi.org/10.1109/ICON.2003.1266179> (Published)

## Research Grants

### Singapore Management University

AP-Coach: AI-based formative feedback generation to improve student learning outcomes in introductory programming courses, Tertiary Education Research Fund (TRF), Ministry of Education (MOE) , PI (Project Level): Don TA , Co-PI (Project Level): SHAR Lwin Khin, Venky SHANKARARAMAN, 2022, S\$200,741.6

ADrone: Auditing Drone Behaviours for Accountability of Criminal/Malicious Activities, NSoE MSS-CS Research Programme, National Satellite of Excellence - Mobile Systems Security and Cloud Security , PI (Project Level): SHAR Lwin Khin , Co-PI (Project Level): Don TA, JIANG Lingxiao, 2021, S\$594,220

### Other Institutions

CloudNPlay: An Open-Source Cloud-Native Gaming System, SCIS Seed Funding for Practice Research, SMU

SCIS PI (Project Level): Don TA, 2021, SGD41,478

MLAnywhere: Distributed Machine Learning on Heterogeneous Public Computing Services, MOE Tier 1, MOE PI (Project Level): Don TA, SGD30,000

BlockAgent: Transforming Regional Air Traffic Flow Management via Blockchain based Decentralized Multi-Agent Systems, ATMRI, CAAS PI (Project Level): Don TA, SGD120,000

LearningChain: decentralizing teaching and learning via blockchain technology, Edex Grants, NTU PI (Project Level): Don TA, SGD34,059

FogGrid: Transforming Microgrid Operations via Blockchain and Fog Computing in Singapore, Energy Resilience, EMA Co-PI (Project Level): Don TA, SGD150,000

Toward joint IT-thermal optimization to improve energy efficiency for high-ambient temperature data centre in the tropics via learning-based algorithms, Green Data Centre Programme, IMDA Co-PI (Project Level): Don TA, SGD150,000

Towards truly on-demand resources for latency-sensitive services and applications on public clouds, MOE Tier 1, MOE PI (Project Level): Don TA, SGD98,505

SEFA: a secure system for executing untrusted code on clouds, to support interactive self-learning of computer programming via fast, automatic program evaluation, Edex Grants, NTU PI (Project Level): Don TA, SGD18,230

QoS-aware cloud resource provisioning, AWS Research Grants, AWS PI (Project Level): Don TA, SGD6,800

## TEACHING

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### Teaching Areas

Programming Languages

Operating Systems

Distributed Systems

### Courses Taught

#### Singapore Management University

Undergraduate Programmes :

Collaborative Software Development

Enterprise Solution Management

Introduction to Programming

IS Project Experience (Applications)

Postgraduate Professional Programmes :

Agile and DevSecOps

Blockchain and the New Economies

Postgraduate Research Programmes :

Empirical Research Project I  
Empirical Research Project II  
Empirical Research Project III