

## **OUH Eng Lieh**

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Singapore Management University (SMU)  
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## **Education**

PhD, National University of Singapore, Singapore, 2015  
Master of Technology, National University of Singapore, Singapore, 2004  
Bachelor of Science, National University of Singapore, Singapore, 1999

## **Academic Appointments**

Associate Professor of Computer Science (Education), School of Computing and Information Systems, SMU, Jul 2023 - Present  
Assistant Professor of Computer Science (Education), School of Computing and Information Systems, SMU, Apr 2021 - Jun 2023  
Assistant Professor of Information Systems (Education), School of Computing and Information Systems, SMU, Feb 2018 - Mar 2021

## **Academic Administrative Positions**

Director, BSc (IS) Information Systems Major, School of Computing and Information Systems, SMU, Jul 2020 - Present  
Programme Director, BSc (IS) Information Systems Major, School of Computing and Information Systems, SMU, Jan 2020 - Jun 2020

## **Other Positions and Affiliations**

Associate, Institute of Systems Science, National University of Singapore, Singapore, Oct 2008 - Jan 2018  
Software Architect, Sun Microsystems Pte Ltd, Singapore, Apr 2008 - Sep 2008  
Advisory IT Specialist, IBM Singapore Pte Ltd, Singapore, Aug 1999 - Mar 2008

## **Professional Certifications**

IBM Certified Senior IT Specialist, Certified Scrum Master (CSM), Consultancy Related Certifications, 2011  
AWS Certified Solutions Architect, Certified The Open Group Architecture Forum (TOGAF), Sun Certified Enterprise Architect (SCEA), Software Architecture Related Certifications, 2008

Certified Information Systems Security Professional (CISSP), Certified Secure Software Lifecycle Professional (CSSLP), Security Related Certifications, 2005

Sun Certified Programmer (SCPP), Sun Certified Developer (SCDP), Software Development Related Certifications, 2000

### Awards and Honors

IEEE Senior Member (IEEE Education Society), IEEE, 2020

Specialist Adult Educator, Adult Education Professionalization (AEP), 2017

### Professional Memberships

Member, Association for Computing Machinery, 2018

Member, Institute of Electrical and Electronics Engineers, 2018

Member, Singapore Computer Society (SCS), 2008

Member, International Information Systems Security Certification Consortium (ISC), 2005

## RESEARCH

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### Publications

#### Journal Articles [Refereed]

Automated doubt identification from informal reflections through hybrid sentic patterns and machine learning approach, by LO, Siaw Ling; TAN, Kar Way; OUH, Eng Lieh. (2021). *Research and Practice in Technology Enhanced Learning*, 16 (1), 1-24. <https://doi.org/10.1186/s41039-021-00149-9> (Published)

An approach for clone detection in documentation reuse, by LUTSIV, Dmitry V.; KOZNOV, Dmitry; BASIT, Hamid A.; OUH, Eng Lieh; SMIRNOV, Mikhail N.; ROMANOVSKY, Konstantin Y.. (2014). *Scientific and Technical Journal of Information Technologies, Mechanics and Optics*, 14 (4), 106-114. <http://ntv.ifmo.ru/file/article/10381.pdf> (Published)

#### Book Chapters

Cloud, edge, and fog computing: Trends and case studies, by OUH, Eng Lieh; JAZABEK, Stanislaw; GEOK, Shan Lim; MASAYOSHI, Ogawa.. (2021). In Kavita Taneja, Harmunish Taneja, Kuldeep Kumar, Arvind Selwal, Eng Lieh Ouh (Ed.), *Data Science and Innovations for Intelligent Systems: Computational Excellence and Society 5.0* CRC Press. <http://doi.org/10.1201/9781003132080-8> (Published)

Cloud, edge and fog computing: Trends and case studies, by OUH, Eng Lieh; JARZABEK, Stanislaw; LIM, Geok Shan; MASAYOSHI, Ogawa. (2021). In Kavita Taneja, Harmunish Taneja, Kuldeep Kumar, Arvind Selwal, & Eng Lieh Ouh (Ed.), *Data science and innovations for intelligent systems* (pp. 181-208) Boca Raton: CRC Press. <https://doi.org/10.1201/9781003132080-8> (Published)

#### Edited Books

*Data science and innovations for intelligent systems: Computational excellence and society 5.0*, edited by TANEJA, Kavita; TANEJA, Harmunish; KUMAR, Kuldeep; SELWAL, Arvind; OUH, Eng Lieh. (2021). Boca Raton: CRC Press. <https://doi.org/10.1201/9781003132080> (Published)

## Conference Proceedings

Sustainability Projects with a Community Partner, a social norm nudging effort, by Benjamin Kok Siew Gan, Thomas Menkhoff, and Eng Lieh Ouh. (2023.0). *IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE)*, <http://www.computer.org/cps>: IEEE Computer Society Conference Publishing Services (CPS). (Forthcoming)

Class Participation, Using Technology to Enhance Efficiency and Fairness, by Benjamin Kok Siew Gan and Eng Lieh Ouh. (2023.0). *IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE)*, <http://www.computer.org/cps>: IEEE Computer Society Conference Publishing Services (CPS). (Forthcoming)

ChatGPT, can you generate solutions for my coding exercises? An evaluation on its effectiveness in an undergraduate Java programming course, by OUH, Eng Lieh; GAN, Benjamin Kok Siew, SHIM, Kyong Jin; WLODKOWSKI, Swavek. (2023.0). *ITiCSE 2023: Proceedings of the 2023 Conference on Innovation and Technology in Computer Science Education, Turku, Finland, July 10-12*, (pp. 54-60) New York: ACM. <https://doi.org/10.1145/3587102.3588794> (Published)

Machine-learning approach to automated doubt identification on stack overflow comments to guide programming learners, by CHEN, Tianhao; OUH, Eng Lieh; TAN, Kar Way; LO, Siaw Ling. (2023.0). *Proceedings of 2023 Pacific Asia Conference on Information Systems, Nanchang, China, July 8-12*, (pp. 1-16) Nanchang, China: PACIS. (Published)

Are you cloud-certified? Preparing computing undergraduates for cloud certification with experiential learning, by OUH, Eng Lieh; GAN, Benjamin. (2023.0). *Proceedings of the 2023 IEEE/ACM 45th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET), Melbourne, Australia, May 14-20*, (pp. 46-57) Los Alamitos, CA: IEEE. <https://doi.org/10.1109/ICSE-SEET58685.2023.00011> (Published)

An exploratory study of architectural style and effort estimation for multi-tenant microservices-based Software as a Service (SaaS), by OUH, Eng Lieh; GAN, Benjamin Kok Siew. (2023.0). *Proceedings of the 2023 IEEE 20th International Conference on Software Architecture Companion (ICSA-C), L'Aquila, Italy, March 13-17*, Los Alamitos, CA: IEEE. <https://doi.org/10.1109/ICSA-C57050.2023.00043> (Published)

Implementation of Empath X SLA predictive tool for a government agency, by LEE, Alvina Hui Shan Lee; SHANKARARAMAN, Venky; OUH, Eng Lieh. *2022 International Conference on Big Data, Osaka, Japan; December 17-20, Osaka Japan*: (Presented)

Designing flipped learning activities for beginner programming course, by GAN, Benjamin Kok Siew; OUH, Eng Lieh. (2022.0). *Proceedings of 28th AMCIS: Innovative Research Informing Practice, Minneapolis, 2022 August 10-14*, (pp. 1-10) eLibrary: AIE eLibrary. [https://aisel.aisnet.org/amcis2022/sig\\_ed/](https://aisel.aisnet.org/amcis2022/sig_ed/) (Published)

AI-enabled adaptive learning using automated topic alignment and doubt detection, by TAN, Kar Way; LO, Siaw Ling; OUH, Eng Lieh; NEO, Wei Leng. (2022.0). *Proceedings of the 2022 Annual Pacific Asia Conference on Information Systems, Virtual Conference, July 5-9*, (pp. 1-16) US: Association for Information Systems (AIS). <https://aisel.aisnet.org/pacis2022/110/> (Published)

Learnings from a pilot hybrid question answering system: CQAS: Case study based on a Singapore government agency's customer service centre, by SHAN, Alvina Lee Hui; SHANKARARAMAN, Venky; OUH, Eng Lieh

. (2022.0). *DG.O 2022: Proceedings of the 23rd Annual International Conference on Digital Government Research, Virtual Conference, June 15-17*, (pp. 437-439) New York: ACM. <https://doi.org/10.1145/3543434.3543661> (Published)

ITSS: Interactive web-based authoring and playback integrated environment for programming tutorials, by OUH, Eng Lieh; GAN, Benjamin Kok Siew; LO, David. (2022.0). *2022 44th IEEE/ACM International Conference on Software Engineering, Virtual, May 8-13: Proceedings*, (pp. 158-164) Piscataway, NJ: IEEE. <https://doi.org/10.1145/3510456.3514142> (Published)

Lessons learnt conducting Capture the Flag CyberSecurity Competition during COVID-19, by TAN, Kee Hock; OUH, Eng Lieh. (2021.0). *2021 IEEE Frontiers in Education Conference (FIE), Lincoln, Nebraska USA*: IEEE. <https://doi.org/10.1109/FIE49875.2021.9637404> (Published)

Integration of information technology certifications into undergraduate computing curriculum, by OUH,

Eng Lieh; SHIM, Kyong Jin. (2021.0). *2021 IEEE Frontiers in Education Conference (FIE)*, Lincoln, Nebraska USA: IEEE. <http://doi.org/10.1109/FIE49875.2021.9637266> (Published)

Effective digital learning practices for IS design courses during COVID-19, by OUH, Eng Lieh; GAN, Benjamin Kok Siew. (2021.0). *Proceedings of 27th Americas Conference on Information Systems, Virtual Conference, 2021 August 9-13*, (pp. 1-10) United States: AIS eLibrary. [https://aisel.aisnet.org/amcis2021/is\\_education/](https://aisel.aisnet.org/amcis2021/is_education/) (Published)

BugsInPy: A database of existing bugs in Python programs to enable controlled testing and debugging studies, by WIDYASARI, Ratnadira; SIM, Sheng Qin; LOK, Camellia; QI, Haodi; PHAN, Jack; TAY, Qijin; TAN, Constance; WEE, Fiona; TAN, Jodie Ethelda; YIEH, Yuheng; GOH, Brian; THUNG, Ferdian; KANG, Hong Jin; HOANG, Thong; LO, David; OUH, Eng Lieh. (2020.0). *ESEC/FSE 2020: Proceedings of the 28th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering: 9-13 November, Virtual*, (pp. 1556-1560) New York: ACM. <https://doi.org/10.1145/3368089.3417943> (Published)

Did our course design on software architecture meet our student's learning expectations?, by OUH, Eng Lieh; GAN, Benjamin Kok Siew; IRAWAN, Yunghans. (2020.0). *Proceedings of 2020 IEEE Frontiers in Education Conference (FIE), Uppsala, Sweden, October 21-24*, (pp. 1-9) Uppsala, Sweden: IEEE. <https://www.fie2020.org/abstracts-and-papers/> (Published)

Experience report on the use of technology to manage capstone course projects, by GAN, Benjamin Kok Siew; OUH, Eng Lieh. (2020.0). *2020 IEEE Frontiers in Education Conference (FIE): Uppsala, Sweden, October 21-24: Proceedings*, (pp. 1-8) Piscataway, NJ: IEEE. <https://doi.org/10.1109/FIE44824.2020.9274111> (Published)

Evaluating methods for students to identify and clarify doubts in computing design courses, by OUH, Eng Lieh; GAN, Benjamin Kok Siew. (2020.0). *2020 IEEE Frontiers in Education Conference (FIE): Uppsala, Sweden, October 21-24: Proceedings*, (pp. 1-9) Piscataway, NJ: IEEE. <https://doi.org/10.1109/FIE44824.2020.9274170> (Published)

A longitudinal study of a capstone course, by GAN, Benjamin Kok Siew; OUH, Eng Lieh; LEE, Yin Yin Fiona. (2020.0). *Proceedings of the Americas Conference of Information Systems: 26th AMCIS 2020, Salt Lake City, UT, August 10-14*, (pp. 1-9) Atlanta: Association for Information Systems. (Published)

Designing learning activities for experiential learning in a design thinking course, by GAN, Benjamin Kok Siew; OUH, Eng Lieh. (2019.0). *2019 IEEE International Conference on Engineering, Technology and Education (TALE)*, Yogyakarta, Indonesia: (Presented)

Do my students understand? Automated identification of doubts from informal reflections, by LO, Siaw Ling; TAN, Kar Way; OUH, Eng Lieh. (2019.0). *Proceedings of the 27th International Conference on Computers in Education, Kenting, Taiwan, December 2-6*, (pp. 1-10) Kenting, Taiwan: Asia-Pacific Society for Computers in Education. (Published)

Applying case-based learning for a postgraduate software architecture course, by OUH, Eng Lieh; IRAWAN, Yunghans. (2019.0). *ITiCSE '19: Proceedings of the 24th ACM Conference on Innovation and Technology in Computer Science Education, Aberdeen, July 15-17*, (pp. 457-463) New York: ACM. <https://doi.org/10.1145/3304221.3319737> (Published)

Exploring experiential learning model and risk management process for an undergraduate software architecture course, by OUH, Eng Lieh; IRAWAN, Yunghans. (2018.0). *2018 48th Frontiers in Education (FIE): San Jose, CA, October 3-6: Proceedings*, (pp. 1-9) Piscataway, NJ: IEEE. <https://doi.org/10.1109/FIE.2018.8659200> (Published)

Teaching adult learners on software architecture design skills, by OUH, Eng Lieh; IRAWAN, Yunghans. (2018.0). *Proceedings of the 48th Annual Frontiers in Education 2018: Fostering Innovation Through Diversity, San Jose, California, October 3-6*, (pp. 1-9) San Jose, California: (Published)

An adaptability-driven model and tool for analysis of service profitability, by OUH, Eng Lieh; STAN, Jarzabek. (2016.0). *Proceedings of International Conference on Advanced Information Systems Engineering, Slovenia, June 13-17*, (pp. 393-408) Slovenia: [https://10.1007/978-3-319-39696-5\\_24](https://10.1007/978-3-319-39696-5_24) (Published)

Mood self-assessment on smartphones, by KHUE, Le Minh; OUH, Eng Lieh; JARZABEK, Stan. (2015.0). *WH 15: Proceedings of the conference on Wireless Health, Bethesda, Maryland, 14-16 October*, (pp. 1-8) Maryland: ACM. <https://10.1145/2811780.2811921> (Published)

Clone detection in reuse of software technical documentation, by DMITRIJ, Koznov, DMITRIJ, Luciv, HAMID, Abdul Basit, OUH, Eng Lieh, SMIRNOV, Mikhail. (2015.0). *Proceedings of the 10th International Andrei Ershov Informatics Conference: Perspectives of System Informatics, Russia2015 August 24-27*, (pp. 170-185) Russia: [https://doi.org/10.1007/978-3-319-41579-6\\_14](https://doi.org/10.1007/978-3-319-41579-6_14) (Published)

A conceptual model to evaluate decisions for service profitability, by OUH, Eng Lieh; JARZABEK, Stan. (2015.0). *Service Computation 2015: The Seventh International Conferences on Advanced Service Computing: March 22-27, Nice, France*, (pp. 61-66) Wilmington, DE: IARIA. (Published)

Understanding service variability for profitable software as a service: Service providers' perspective, by OUH, Eng Lieh; JARZABEK, Stan. (2014.0). *Proceedings of the CAiSE 2014 Forum and CAiSE 2014 Doctoral Consortium co-located with the 26th International Conference on Advanced Information Systems Engineering (CAiSE 2014), Thessaloniki, Greece, June 18-20*, (pp. 9-16) Thessaloniki, Greece: [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKewiTza3R9s3fAhUKQI8KHRGVBEQQFjAAegQIABAC&url=http://ceur-ws.org/Vol-1164/PaperVision02.pdf&usg=AOvVaw3-Le2bZ4jw2I3oWXUE8T\\_U](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKewiTza3R9s3fAhUKQI8KHRGVBEQQFjAAegQIABAC&url=http://ceur-ws.org/Vol-1164/PaperVision02.pdf&usg=AOvVaw3-Le2bZ4jw2I3oWXUE8T_U) (Published)

### Conference Papers

How to and how much? Teaching ethics in an interaction design course, by WADHWA, Bimlesh; LIEH, Ouh Eng; GAN, Benjamin Kok Siew. (2020.0). *2nd Annual Symposium on HCI Education A (Virtual) CHI 2020 Symposium, Honolulu, USA, 2020 April 25-30*, Hawaii, USA. (Published)

### Edited Conference Proceedings

*SEED 2021  
4th Software Engineering Education Workshop*

*QuASoQ 2021  
9th International Workshop on Quantitative Approaches to Software Quality*, edited by Benjamin Gan; Eng Lieh Ouh; Bimlesh Wadhwa; Shailey Chawla; Horst Lichter; Selin Aydin; Thanwadee Sunetnanta and Toni Anwar. (31/12/2021). Taipei : CEUR Workshop Proceedings. (Published)

*SEED 2021 4th Software Engineering Education Workshop and QuASoQ 2021 9th International Workshop on Quantitative Approaches to Software Quality: Joint Proceedings of SEED & QuASoQ, Taipei [Virtual], December 6*, edited by GAN, Benjamin; OUH, Eng Lieh; WADHWA, Bimlesh; CHAWLA, Shailey; LICHTER, Horst; AYDIN, Selin; SUNETNANTA, Thanwadee; ANWAR, Toni. (16/12/2021). Aachen University: CEUR Workshop Proceedings. <http://ceur-ws.org/Vol-3062/> (Published)

### **Research Grants**

#### Singapore Management University

Titan Code Analysis: Vulnerability Discovery with Large Code Models, Translational R&D 2.0 Grant (TRANS2.0), Smart Nation Group , PI (Project Level): David LO , Co-PI (Project Level): SHAR Lwin Khin, OUH Eng Lieh, 2023

#### Other Institutions

Adaptive Learning with Automated Doubt Mining and Topic Alignment, Technology-Enabled Learning Grant, Centre of Teaching Excellence PI (Project Level): TAN Kar Way, Co-PI (Project Level): LO Siaw Ling, OUH Eng Lieh, 2020

Interactive Programming Vid-eo Tutorial System to im-prove Learning Outcome of Programming Courses in Higher Education, SMU Educational Research Fellowship, Centre of Teaching Excellence PI (Project Level): OUH Eng Lieh, 2020

## TEACHING

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### Courses Taught

#### Singapore Management University

##### Undergraduate Programmes :

- Architectural Analysis
- Cloud Solution Development Work-Study Elective
- Interaction Design and Prototyping
- IS Application Project
- IT Solution Architecture
- Object Oriented Programming

##### Postgraduate Professional Programmes :

- Capstone Project - Cybersecurity
- Capstone Project - Software and Cyber-Physical Systems

##### Postgraduate Research Programmes :

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

##### Executive Development :

- Technology Appreciation Course, Health Promotion Board, 01 Jan 2019-Present

#### Other Institutions

Architecting Software Solutions, Enterprise Integration, Enterprise Java, Mobile Wireless Application Development, Secure Software Lifecycle, Masters, Institute of Systems Science, National University of Singapore

Architecting Software Solutions, Evaluating Software Architectures, Building Enterprise Applications Using Java Enterprise Edition, Designing Secure Mobile Architecture, Qualified Information Security Professional Course, Certified Secure Software Lifecycle Professional (CSSLP) CBK Review Seminar, Certified Information Systems Security Professional (CISSP) CBK Review Seminar, Non-Graduating, Institute of Systems Science, National University of Singapore

Mobile Wireless Application Development, Graduate Diploma, Institute of Systems Science, National University of Singapore

## OTHER ACADEMIC AND PROFESSIONAL ACTIVITIES

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### Presentation and Talks

#### Presentations

Information Security Technology as a Catalyst for the Development of Information Security, (01 Aug 2014). *Authentication Technology & Information Security Summit*, Zhuhai, China. China

Service Variability in Multi-Tenant Engineering: A Systematic Literature Review on the State of Practice, Limitations and Prospects, (01 May 2014). *Software Engineering Institute (SEI) Architecture Technology User Network (SATURN)*,

### Consultancy

Institute Of Systems Science, National University of Singapore, Oct 2008

Sun Microsystems Pte Ltd, Apr 2008 - Sep 2008

IBM Singapore Pte Ltd, Aug 1999 - Mar 2008

### Media Contributions and Citations

Effective use of cloud resources to spur business growth, SMU Podcast, 01 Oct 2019  
<https://engage.smu.edu.sg/effective-use-cloud-resources-spur-business-growth>

Silver linings and dark sides of the cloud, Business Times, 05 Mar 2019  
<https://www.businesstimes.com.sg/sme/silver-linings-and-dark-sides-of-the-cloud>

中小企业如何善用云端服务? How SMEs can better utilise cloud resources for their business?, Lianhe Zaobao, 07 Feb 2019 <https://www.zaobao.com.sg/finance/singapore/story20190207-929904>

## UNIVERSITY SERVICE

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### Singapore Management University

Committee Member, Task and Finish Group, Dec 2020 - May 2021

Program Director, Information Systems Programme, Jan 2020 - Present

Chairperson, Reading Evaluation Committee, Nov 2019 - Feb 2020

Program Coordinator, SIS Interaction Day, Jan 2019 - Apr 2019

Member, SIS Discovery Day IS Workshop, Jan 2019 - Apr 2019

Program Coordinator, SMU-UCL BSc-MSc Accelerated Programme, Aug 2018 - Present

Reader, SIS Undergrad Commencement Ceremony, Jul 2018 - Aug 2018

Committee Member, Reading Evaluation Committee, Jun 2018 - Present

Committee Member, School Evaluation Committee, Jun 2018 - Present

Committee Member, Admissions Committee, Feb 2018 - Dec 2018

**EXTERNAL SERVICE – PROFESSIONAL**

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Editor Book, Book Data Science and Innovations for Intelligent Systems: Computational Excellence and Society 5.0, CRC Press, 2020 - Present

Committee Member, Asia-Pacific Software Engineering Conference - Software Engineering Education Workshop (APSEC-SEED), 2019 - Present

Reviewer Conference Paper, Asia-Pacific Software Engineering Conference - Software Engineering Education Workshop (APSEC-SEED), 2019 - Present

Reviewer Conference Paper, XXI KKIO Software Engineering Conference (KKIO), 2019

Committee Member, XXI KKIO Software Engineering Conference (KKIO), 2019

Reviewer Conference Paper, Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2019 - Present

Committee Member, Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2019 - Present

Reviewer Conference Paper, Frontiers in Education (FIE), 2018 - Present

Editorial Review Board Member, Asian Journal of Computer Science and Technology (AJCST), 2018 - Present

Expert Panel Reviewer, DSTA Technical Competency Accreditation Panel - Enterprise Application Platform, DSTA, 2018 - Present

Expert Panel Reviewer, Republic Polytechnic's Distinguished Professionals and Distinguished Academics (DPDA) scheme, Republic Polytechnic, 2017 - Present

Member, Research Track Program Committee, International Software Product Line Conference (SPLC), 2014 - 2015

Reviewer Ad Hoc Reviewer, International Information System Security Certification Consortium (ISC2), 2010 - Present

Member Advisory Committee, IBM Singapore Pte Ltd, 2005 - 2008