Harold Soh Soon Hong

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	School of Computing	Office: (65) 6516-7367
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RESEARCH INTERESTS

Human-Robot Interaction, Robotics, Machine Learning and Artificial Intelligence.

PROFESSIONAL EXPERIENCE

National University of Singapore, Singapore.
Assistant Professor — **Feb 2017-Present**

University of Toronto, Toronto, ON, Canada.
Postdoctoral Research Fellow, Cognitive Engineering Lab & **Oct 2015-Dec 2016**
Data-Driven Decision Making Lab (D3M)

Singapore-MIT Alliance for Research & Technology (SMART), Singapore.
SMART Postdoctoral Scholar, Future Urban Mobility — **Oct 2013-Sept 2015**

The Institute of High Performance Computing, Agency for Science, Technology and Research (A*STAR), Singapore
Senior Research Officer, Advanced Computing — **Apr 2008-Jul 2009**
Research Officer, Advanced Computing — **Feb 2006-Mar 2008**

ACADEMIC QUALIFICATIONS

Imperial College London, London, United Kingdom

Ph.D., **Artificial Intelligence & Robotics**, November 2013
- Research Topic: Online Spatio-Temporal Learning and Prediction for Robotic Systems [**Nominated for Eryl Cadwaladr Davis Prize 2013/2014**]
- Advisor: Prof. Yiannis Demiris

The University of Melbourne, Victoria, Australia.

Masters (S.S.E.), March 2006.

The University of California, Davis, California, USA.

Bach. Arts & Sciences (Dual Major), Computer Science, Economics, June 2004.
University of California Regents Scholar

AWARDS AND ACHIEVEMENTS

Early Career Spotlight, Robotics: Science and Systems Conference (R:SS), 2023.
Best Paper Award, IEEE Trans. Affec. Computing (T-AFFC), 2022.
Best Paper Award, IEEE/RSJ IROS'21.
NUS Annual Teaching Excellence Award (ATEA), 2020/21
Faculty Teaching Excellence Award (FTEA), 2019/20/21
Best Paper Award Finalist, RSS'18.
Best Paper Award Finalist, ACM/IEEE HRI'18.
Faculty Teaching Excellence Award (FTEA), 2018
Best Paper Award Finalist, ACM RecSys'18.
SMART Scholar Postdoctoral Fellowship Award, 2013.
UK James Dyson Award National Finalist, 2012.
Best Cognitive Robotics Paper Award Finalist, IEEE/RSJ IROS'12.
The Design London Fellowship, 2012.
The Khazanah Global Scholarship, 2009-2013.
IEEE CEC Best Presentation Award, 2006
The University of California Regents Scholarship, 2000-2004.

<table>
<tr><td>PEER-REVIEWED
PUBLICATIONS</td><td>

The top venues in Computer Science are conferences. For robotics, the top conferences are ICRA, IROS, RSS, and HRI. The best general conferences in AI/ML are NeurIPS, ICLR, ICML, AAAI, and IJCAI.

Heng, A., & Soh, H. (2023). Selective amnesia: A continual learning approach to forgetting in deep generative models. In *Advances in Neural Information Processing Systems (NeurIPS) (Accepted).* [**Spotlight**]

Hu, S., Soh, H., & Piliouras, G. (2023). The best of both worlds in network population games: Reaching consensus and convergence to equilibrium. In *Advances in Neural Information Processing Systems (NeurIPS).*

Chen, K., Lim, J. Y., Kuan, K., & Soh, H. (2023). Latent emission-augmented perspective-taking (leapt) for human-robot interaction. In *Ieee/rsj international conference on intelligent robots and systems.*

Zhang, B., & Soh, H. (2023). Large language models as zero-shot human models for human-robot interaction. In *Ieee/rsj international conference on intelligent robots and systems.* Retrieved from `https://arxiv.org/abs/2303.03548`

Taunyazov, T., Zhang, H., Eala, J. P., Zhao, N., & Soh, H. (2023). Refining 6-dof grasps with context-specific classifiers. In *Ieee/rsj international conference on intelligent robots and systems.* Retrieved from `https://arxiv.org/abs/2308.06928`

Fatir Ansari, A., Heng, A., Lim, A., & Soh, H. (2023). Neural continuous-discrete state space models for irregularly-sampled time series. In *International conference on machine learning (icml).* [**Oral**]

Balakrishnan, S., Bi, J., & Soh, H. (2022). SCALES: From Fairness Principles to Constrained Decision-Making. In *Proceedings of the AAAI/ACM Conference on Artificial Intelligence, Ethics and Society (AIES).*

Chen, K., Fong, J., & Soh, H. (2022). MIRROR: Differentiable Deep Social Projection for Assistive Human-Robot Communication. In *Proceedings of Robotics: Science and Systems.*

Yam, K. C., Goh, E.-Y., Fehr, R., Lee, R., Soh, H., & Gray, K. (2022). When your boss is a robot: Workers are more spiteful to robot supervisors that seem more human. *Journal of Experimental Social Psychology.*

Hu, S., Leung, C.-W., fung Leung, H., & Soh, H. (2022). The dynamics of q-learning in population games: a physics-inspired continuity equation model. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS).*

Ansari, A. F., Benidis, K., Kurle, R., Turkmen, A. C., Soh, H., Smola, A., ... Januschowski, T. (2021). Deep explicit duration switching models for time series. In *Neural Information Processing Systems (NeurIPS).*

Taunyazov, T., Song, L. S., Lim, E., See, H. H., Lee, D., Tee, B. C., & Soh, H. (2021). Extended tactile perception: Vibration sensing through tools and grasped objects. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* [**Best Paper Award**]

Ansari, A. F., Ang, M. L., & Soh, H. (2021). Refining deep generative models via discriminator gradient flow. In *International Conference on Learning Representations (ICLR).*

Xie, Y., Zhou, F., & Soh, H. (2021). Embedding symbolic temporal knowledge into deep sequential models. In *IEEE International Conference on Robotics and Automation (ICRA).*

Chen, K., Lee, Y., & Soh, H. (2021). Multi-modal mutual information (mummi) training for robust self-supervised deep reinforcement learning. In *IEEE International Conference on Robotics and Automation (ICRA).*

Teh, N., Hu, S., & Soh, H. (2021). A theoretical framework for large-scale human-robot interaction with groups of learning agents. In *Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction.*

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Balakrishnan, S., Nguyen, Q. P., Low, B. K. H., & Soh, H. (2020). Efficient exploration of reward functions in inverse reinforcement learning via bayesian optimization. *Advances in Neural Information Processing Systems*, *33*.

Ansari, A. F., Scarlett, J., & Soh, H. (2020). A characteristic function approach to deep implicit generative modeling. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 7478–7487). [**Oral, $< 5\%$ Acceptance Rate**]

Kok, B. C., & Soh, H. (2020). Trust in robots: Challenges and opportunities. *Current Robotics Reports*, *1*(4), 297–309. doi: 10.1007/s43154-020-00029-y

Soh, H., Xie, Y., Chen, M., & Hsu, D. (2020). Multi-task trust transfer for human-robot interaction. *The International Journal of Robotics Research*, *39*(2-3), 233–249.

Lee, J., Fong, J., Kok, B. C., & Soh, H. (2020). Getting to know one another: Calibrating intent, capabilities and trust for human-robot collaboration. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*.

Gu, F., Sng, W., Taunyazov, T., & Soh, H. (2020). TactileSGNet: A Spiking Graph Neural Network for Event-based Tactile Object Recognition. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*.

Taunyazov, T., Chua, Y., Gao, R., Soh, H., & Wu, Y. (2020). Fast texture classification using tactile neural coding and spiking neural network. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*.

Bodala, I. P., Kok, B. C., Sng, W., & Soh, H. (2020). Modeling the interplay of trust and attention in hri: An autonomous vehicle study. In *Companion of the 2020 ACM/IEEE International Conference on Human-Robot Interaction* (pp. 145–147).

Lim, E., Kok, B. C., Wang, S., Lee, J., & Soh, H. (2020). Juiced and Ready to Predict Private Information in Deep Cooperative Reinforcement Learning. In *Companion of the ACM/IEEE International Conference on Human-Robot Interaction* (pp. 343–345).

Taunyazov, T., Sng, W., See, H. H., Lim, B., Kuan, J., Ansari, A. F., . . . Soh, H. (2020). Event-driven visual-tactile sensing and learning for robots. In *Robotics: Science and Systems (RSS)*.

Yam, K. C., Bigman, Y. E., Tang, P. M., Ilies, R., De Cremer, D., Soh, H., & Gray, K. (2020). Robots at work: People prefer—and forgive—service robots with perceived feelings. *The Journal of Applied Psychology.*.

Tan, Z.-X., Soh, H., & Ong, D. (2020). Factorized inference in deep markov models for incomplete multimodal time series. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 34).

Ansari, A. F., & Soh, H. (2019). Hyperprior induced unsupervised disentanglement of latent representations. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 33, pp. 3175–3182). [**Spotlight**]

Ong, D., Soh, H., Zaki, J., & Goodman, N. (2019). Applying probabilistic programming to affective computing. *IEEE Transactions on Affective Computing*. doi: 10.1109/TAFFC.2019.2905211 [**Best Paper Award**]

Taunyazov, T., Koh, H. F., Wu, Y., Cai, C., & Soh, H. (2019). Towards effective tactile identification of textures using a hybrid touch approach. In *2019 International Conference on Robotics and Automation (ICRA)* (pp. 4269–4275).

Wu, G., Luo, K., Sanner, S., & Soh, H. (2019). Deep language-based critiquing for recommender systems. In *Proceedings of the 13th acm conference on recommender systems* (pp. 137–145).

Xie, Y., Bodala, I. P., Ong, D. C., Hsu, D., & Soh, H. (2019). Robot capability and intention in trust-based decisions across tasks. In *2019 14th ACM/IEEE International Conference on Human-Robot Interaction (HRI)* (pp. 39–47).

Yaqi, X., Xu, Z., Meel, K. S., Kankanhalli, M., & Soh, H. (2019). Embedding symbolic knowledge into deep networks. In *Advances in Neural Information Processing Systems* (pp. 4235–4245).

Soh, H., Pan, S., Min, C., & Hsu, D. (2018, June). The transfer of human trust in robot capabilities across tasks. In *Proceedings of robotics: Science and systems.* Pittsburgh, Pennsylvania. doi: 10.15607/RSS.2018.XIV.033 [**Best Paper Finalist**]

Chen, M., Nikolaidis, S., Soh, H., Hsu, D., & Srinivasa, S. (2018). Planning with trust for human-robot collaboration. In *Proceedings of the 2018 ACM/IEEE International Conference on Human-Robot Interaction* (pp. 307–315). [**Best Paper Finalist**]

Kortschot, S. W., Sovilj, D., Jamieson, G. A., Sanner, S., Carrasco, C., & Soh, H. (2018). Measuring and mitigating the costs of attentional switches in active network monitoring for cybersecurity. *Human factors*, *60*(7), 962–977.

Lee, Y., Vo, T. V., Lim, K. W., & Soh, H. (2018). Z-transforms and its inference on partially observable point processes. In *International Joint Conference on Artificial Intelligence (IJCAI)* (pp. 2369–2375).

Sovilj, D., Sanner, S., Soh, H., & Li, H. (2018). Collaborative filtering with behavioral models. In *Proceedings of the 26th Conference on User Modeling, Adaptation and Personalization* (pp. 91–99).

Vo, T. V., & Soh, H. (2018). Generation meets recommendation: proposing novel items for groups of users. In *Proceedings of the 12th ACM Conference on Recommender Systems* (pp. 145–153). [**Best Paper Finalist**]

Azevedo, C. L., Deshmukh, N. M., Marimuthu, B., Oh, S., Marczuk, K., Soh, H., . . . Ben-Akiva, M. E. (2017). Simmobility short-term: An integrated microscopic mobility simulator. *Transportation Research Record*, *2622*(1), 13–23.

Kinathil, S., Soh, H., & Sanner, S. (2017). Analytic decision analysis via symbolic dynamic programming for parameterized hybrid mdps. In *Twenty-Seventh International Conference on Automated Planning and Scheduling.*

Kortschot, S. W., Sovilj, D., Soh, H., Jamieson, G. A., Sanner, S., Carrasco, C., . . . Langevin, S. (2017). An open source adaptive user interface for network monitoring. In *2017 IEEE International Conference on Systems, Man, and Cybernetics (SMC)* (pp. 1535–1539).

Soh, H., Sanner, S., White, M., & Jamieson, G. (2017). Deep sequential recommendation for personalized adaptive user interfaces. In *Proceedings of the 22nd International Conference on Intelligent User Interfaces* (pp. 589–593).

Azevedo, C. L., Marczuk, K., Raveau, S., Soh, H., Adnan, M., Basak, K., . . . others (2016). Microsimulation of demand and supply of autonomous mobility on demand. *Transportation Research Record*, *2564*(1), 21–30.

Soh, H. (2016). Distance-preserving probabilistic embeddings with side information: Variational bayesian multidimensional scaling gaussian process. In *International Joint Conference on Artificial Intelligence (IJCAI)* (pp. 2011–2018).

Soh, H., & Demiris, Y. (2015). Learning assistance by demonstration: Smart mobility with shared control and paired haptic controllers. *Journal of Human-Robot Interaction*, *4*(3), 76–100.

Soh, H., & Demiris, Y. (2014a). Incrementally learning objects by touch: Online discriminative and generative models for tactile-based recognition. *IEEE Transactions on Haptics*, *7*(4), 512–525.

Soh, H., & Demiris, Y. (2014b). Spatio-temporal learning with the online finite and infinite echo-state gaussian processes. *IEEE Transactions on Neural Networks and Learning Systems*, *26*(3), 522–536.

Soh, H., Su, Y., & Demiris, Y. (2012). Online spatio-temporal Gaussian process experts with application to tactile classification. In *Intelligent robots and systems (iros), 2012 ieee/rsj international conference on* (pp. 4489–4496). [**Best Cognitive Robotics Paper Finalist**]

Sarabia, M., Le Mau, T., Soh, H., Naruse, S., Poon, C., Liao, Z., . . . Demiris, Y. (2013). iCharibot: Design and Field Trials of a Fundraising Robot. In *International Conference on Social Robotics* (pp. 412–421).

Su, Y., Wu, Y., Soh, H., Du, Z., & Demiris, Y. (2013). Enhanced kinematic model for dexterous manipulation with an underactuated hand. In *2013 IEEE/RSJ International Conference on Intelligent Robots and Systems* (pp. 2493–2499).

Soh, H., & Demiris, Y. (2011). Evolving policies for multi-reward partially observable Markov decision processes (MR-POMDPs). In *Proceedings of the 13th annual conference on Genetic and evolutionary computation* (pp. 713–720).

Zhang, T., Fu, X., Kwoh, C. K., Xiao, G., Wong, L., Ma, S., . . . Lees, M. (2011). Temporal factors in school closure policy for mitigating the spread of influenza. *Journal of Public Health Policy*, *32*(2), 180–197.

Soh, H., Ong, Y.-S., Nguyen, Q. C., Nguyen, Q. H., Habibullah, M. S., Hung, T., & Kuo, J.-L. (2010). Discovering unique, low-energy pure water isomers: Memetic exploration, optimization, and landscape analysis. *IEEE Transactions on Evolutionary Computation*, *14*(3), 419–437.

Xiao, S., Xiao, G., Cheng, T., Ma, S., Fu, X., & Soh, H. (2010). Robustness of scale-free networks under rewiring operations. *EPL (Europhysics Letters)*, *89*(3), 38002.

Soh, H., Lim, S., Zhang, T., Fu, X., Lee, G. K. K., Hung, T. G. G., . . . Wong, L. (2010). Weighted complex network analysis of travel routes on the singapore public transportation system. *Physica A: Statistical Mechanics and its Applications*, *389*(24), 5852–5863.

Zhang, T., Fu, X., Kwoh, C. K., Xiao, G., Wong, L., Ma, S., . . . Lees, M. (2010). Effects of temporal factors in school closure policy for mitigating the spread of influenza. *Journal of Public Health Policy*.

Schreiber, M. J., Holmes, E. C., Ong, S. H., Soh, H. S., Liu, W., Tanner, L., . . . others (2009). Genomic epidemiology of a dengue virus epidemic in urban singapore. *Journal of virology*, *83*(9), 4163–4173.

Nguyen, Q. C., Ong, Y. S., Soh, H., & Kuo, J.-L. (2008). Multiscale approach to explore the potential energy surface of water clusters. *The Journal of Physical Chemistry A*, *112*(28), 6257–6261.

Fu, X., Liew, C., Soh, H., Lee, G., Hung, T., & Ng, L.-C. (2007). Time-series infectious disease data analysis using svm and genetic algorithm. In *2007 ieee congress on evolutionary computation* (pp. 1276–1280).

Salahuddin, M., Hung, T., Soh, H., Sulaiman, E., Soon, O. Y., Sung, L. B., & Yunxia, R. (2007). Grid-based PSE for Engineering of Materials (GPEM). In *Seventh IEEE International Symposium on Cluster Computing and the Grid (CCGrid'07)* (pp. 309–316).

Soh, H., Ong, Y. S., Salahuddin, M., Hung, T., & Sung, L. B. (2007). Playing in the objective space: Coupled approximators for multi-objective optimization. In *2007 IEEE Symposium on Computational Intelligence in Multi-Criteria Decision-Making* (pp. 325–332).

Soh, H., Haque, S., Liao, W., Nadiminti, K., & Buyya, R. (2005). GTPE: A thread programming environment for the grid. In *Proceedings of the 13th International Conference on Advanced Computing and Communications (ADCOM 2005), Coimbatore, India*.

Soh, H., & Kirley, M. (2006). moPGA: Towards a new generation of multi-objective genetic algorithms. In *2006 IEEE International Conference on Evolutionary Computation* (pp. 1702–1709). [**Best Presentation Award**]

PhD Students	Abdul Fatir Ansari (2017-2022, Now Applied Research Scientist at Amazon AI) **Dean's Research Excellence Award 2021, Research Achievement Award 2018** Xie Yaqi (2017-2023, Now Research Fellow at CMU) **Research Achievement Award 2019** Sreejith Balakrishnan (2016-2023, co-supervised with Bryan Low, now at a Trustworthy AI Startup), **Research Achievement Award 2021** Tasbolat Taunyazov (2018-Present, co-supervised with Yan Wu, A*STAR), **Research Achievement Award 2020** Chen Kaiqi (2019-Present) **Research Achievement Award 2021** Bi Jianxin (2021-Present) Shashank Rao Marpally (2021-Present) Zhang Bowen (2021-Present) Eugene Lim (2021-Present) Alvin Heng (2021-Present)
Postdoctoral Research Fellows	Feng Zeyu (2020-Present) Ze Gong (2022-Present) Siddharth Aravindan (2022-2023, joined Samsung as Scientist) James Abraham (2021-2023, joined SMU as a postdoc) Hu Shuyue (2019-2021, now Research Scientist at Shanghai AI Labs) Gu Fuqiang (2019-2020, now Professor at Chongqing University, China) Lee Yong, now Lecturer at Wuhan University of Technology (2019-2020) Zhengkun Yi, now Professor at Shenzhen Institute of Advanced Technology (2018-2019) Indu Prasad (2018-2019, now Lecturer/Asst. Prof. at Southhampton Uni.) Young Lee (2017-2018, joined Harvard University as a Postdoctoral Fellow)
Research Assistants	Sng Weicong (2018-2020, joined NUS as Graduate Tutor / PhD candidate) Kok Bing Cai (2019-2020, Research Assistant, joined NUS Dept of Medicine) Jethro Kuan (2020-2021, Research Assistant, joined ByteDance) Zhu Changxi (2020-2021, joined Utrecht University as PhD candidate) Tong Yichen (2021-2022, joined TUM as Masters Candidate) Tan Yan Tui (2021-2022, joined Temasek Labs as Associate Scientist) Haoyi Yang (2022, joined TUD as PhD Candidate) Jiaming Wang (2022-Present) Kelvin Lin (2022-Present)
Academic Services	**Associate Editor:** ACM Transactions on Human-Robot Interaction (2021-present), IEEE Robotics and Automation Letters (2021-present), International Journal on Robotics Research (2023-present) **Program Committee:** HRI'24 (co-Program Chair) HRI'22 (PC), HRI'21/23 (Technical Advances Theme Chair), HRI'20 (PC), IJCAI'20 (SPC), AAAI'21 (PC), AAAI'20 (PC), AAAI'19 (Senior PC), HRI'19 (LBR Chair), NeurIPS 2018-2021, IJCAI 2016-2018, IEEE SMC 2016. **Ad-hoc Reviewer:** JHRI, RSS 2019, HRI 2018, AAAI 2018, IEEE ICRA 2016-2022, IEEE IROS 2016-2021, ROMAN 17, ISRR 17, IEEE THMS, IEEE TNNSLS, Artificial Intelligence Journal, Autonomous Robots.
Affiliations	ACM, IEEE, AAAS

GRANTS (ON-GOING)	National Robotics Programme (NRP)	**Aug 2023-Feb 2025**
	Advancing Safe Human-Robot Interaction (Approved)	SGD 2,225,040
	PI	
	co-PIs: Angela Yao, David Hsu, Yan Wu,	

National Research Foundation (NRF)   **Mar 2021-Mar 2026**
Centre for Advanced Robotics Technology Innovation   SGD 7,246,000
(CARTIN)
co-PI
PI: Xie Lihua (NTU) , co-PIs: Please see `https://www.ntu.edu.sg/cartin`

AI Singapore Programme, National Research Foundation (NRF) **Apr 2021-March 2025**
Trust to Train and Train to Trust: SGD 6,086,963.76
Agent Training Programs for Safety-Critical Environments
co-PI
PI: Pradeep Varakantham (SMU), co-PIs: Akshat Kumar (SMU), Arunesh Sinha (SMU),
David Lo (SMU), Arvind Easwaran (NTU), Vivian Hsueh Hua Chen (NTU)

AI Singapore Programme, National Research Foundation (NRF) **Apr 2021-March 2025**
The "Other Me": Human-Centered AI Assistance In Situ   SGD 9,551,520.00
co-PI
PI: David Hsu (NUS), co-PIs: Atreyi Kankanhalli (NUS), Lee Wee Sun (NUS), Angela Yao
(NUS), Lee Gim Hee (NUS), Leong Tze-Yun (NUS), Desmond Ong (NUS), Zhao Sheng-
dong (NUS), Pradeep Varakantham (SMU), Akshat Kumar (SMU), Dr. Basura Fernando
(A*STAR), Lu Wei (SUTD), Malika Meghjani (SUTD), Georgios Piliouras (SUTD)

GRANTS (COMPLETED)	AI Singapore Programme, National Research Foundation (NRF)	**Oct 2019-Feb 2023**
	Assistive AI with Artificial Theories of Mind and Body	SGD 750,000
	PI	

National Robotics Program (NRP), A*STAR   **Oct 2019-Mar 2023**
Human Robot Interaction Phase 1   SGD 5,749,000
co-PI
PI: Haoyong Yu (NUS), co-PIs: Haizhou Li (NUS), David Hsu (NUS), Zhipin Lin (NTU)

National Robotics Program (NRP), A*STAR   **June 2021-Aug 2022**
AiSkin 2a: Enhanced Multi-Sensorial Electronic Skins   SGD 1,799,508
for Collaborative Robots
co-PI
PI: Benjamin Tee (NUS), co-PIs: Zhuangjian Liu (A*STAR), Yan Wu (A*STAR)

National Robotics Program (NRP), A*STAR   **Apr 2018-Mar 2021**
AiSkin: Next Generation Intelligent Robot Tactile Sensor   SGD 1,717,000
co-PI
PI: Benjamin Tee (NUS), co-PIs: Zhuangjian Liu (A*STAR)

Ministry of Education (MOE), Singapore   **Mar 2017-Mar 2019**
Intelligent Assistance for Collaborative Design with Deep   SGD 180,000
Probabilistic Networks
PI

Ministry of Education (MOE), Singapore   **Oct 2017-Oct 2021**
Personalized Learning and Assistance for Sustainable Healthcare   SGD 180,000
Management
PI