MAI Anh Tien

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Education

PhD, University of Montreal, Canada, 2016

Master of Science, University of Montreal, Canada, 2012

Bachelor of Science, Hanoi University of Technology, Vietnam, 2009

Academic Appointments

Assistant Professor of Information Systems, School of Computing and Information Systems, SMU, Sep 2020 - Present

Postdoc scholar, Singapore-MIT Alliance for Research and Technology and Massachusetts Institute of Technology, Singapore, Oct 2018 - Aug 2020

Postdoc fellow, CN Chair in Optimization of Railway Operations, and Canada Excellence Research Chair in Data Science for Real-Time Decision-Making, IVADO and GERAD, Canada, Apr 2016 - Sep 2018

Awards and Honors

MIT-SMART scholar fellowship, Singapore-MIT Alliance for Research and Technology (SMART), 2018

INFORMS-TSL Dissertation Prize (1st place), Institute for Operations Research and the Management Sciences, 2016

2016 Eric Pas Dissertation Prize (1st place), International Association for Travel Behaviour Research, 2016

Best Paper Award, European Association for Research in Transportation, 2014

Professional Memberships

Member, Institute for Operations Research and the Management Sciences, 2016 - 2020

RESEARCH

Research Interests

Modelling discrete and sequential decisions in large-scale environments
Modelling and solving large-scale decision-making problems under uncertainty
Discrete choice modelling, route choice modelling
Stochastic/robust optimization, dynamic programming, mixed-integer programming, simulation-based optimization
Applications in urban transportation modelling and revenue/workforce/location management/ security game

Research and Project Areas

Operations Research
Econometrics and Transportation Modeling
Machine Learning

Publications

<u>Journal Articles [Refereed]</u>

Constrained assortment optimization under the cross-nested logit model, by LE, Cuong, MAI, Tien. (2024). *Production and Operations Management, 33* (10), https://doi.org/10.1177/10591478241263857 (Advance Online)

Network-based representations and dynamic discrete choice models for multiple discrete choice analysis, by TRAN, Hung; MAI, Tien. (2024). *Transportation Research Part B: Methodological, 184* 1-22. https://doi.org/10.1016/j.trb.2024.102948 (Published)

Joint location and cost planning in maximum capture facility location under random utilities, by DUONG, Ngan H.; DAM, Tien Thanh; TA, Thuy Anh; MAI, Tien. (2023). *Computers and Operations Research, 159* 1-15. https://doi.org/10.1016/j.cor.2023.106336 (Published)

Robust maximum capture facility location under random utility maximization models, by DAM, Tien Thanh; TA, Thuy Anh; MAI, Tien. (2023). *European Journal of Operational Research, 310* (3), 1128-1150. https://doi.org/10.1016/j.ejor.2023.04.024 (Published)

Estimation of recursive route choice models with incomplete trip observations, by MAI, Tien; BUI, The Viet; NGUYEN, Quoc Phong; LE, Tho V.. (2023). *Transportation Research Part B: Methodological, 173* 313-331. https://doi.org/10.1016/j.trb.2023.05.004 (Published)

Joint chance-constrained staffing optimization in multi-skill call centers, by DAM, Tien Thanh; TA, Thuy Anh; MAI, Tien. (2022). *Journal of Combinatorial Optimization, 44* (1), 354-378. https://doi.org/10.1007/s10878-021-00830-1 (Published)

Submodularity and local search approaches for maximum capture problems under generalized extreme value models, by DAM, Tien Thanh; TA, Thuy Anh; MAI, Tien. (2022). *European Journal of Operational Research, 300* (3), 953-965. https://doi.org/10.1016/j.ejor.2021.09.006 (Published)

Undiscounted Recursive Path Choice Models: Convergence Properties and Algorithms, by MAI, Tien; FREJINGER, Emma. (2022). *Transportation Science, 1*-26. (Published)

On a multistage discrete stochastic optimization problem with stochastic constraints and nested sampling, by TA, Thuy Anh; MAI, Tien; BASTIN, Fabian; L'ECUYER, Pierre. (2021). *Mathematical Programming, 190* (1-2), 1-37. https://doi.org/10.1007/s10107-020-01518-w (Published)

Routing policy choice prediction in a stochastic network: Recursive model and solution algorithm, by MAI, Tien; YU, Xinlian; GAO, Song; FREJINGER, Emma. (2021). *Transportation Research Part B: Methodological, 151* 42-48. https://doi.org/10.1016/j.trb.2021.06.016 (Published)

A multicut outer-approximation approach for competitive facility location under random utilities, by MAI,

Tien; LODI, Andrea. (2020). *European Journal of Operational Research, 284* (3), 874-881. https://doi.org/10.1016/j.ejor.2020.01.020 (Published)

Route choice behaviour and travel information in a congested network: Static and dynamic recursive models, by RAMOS, Giselle de Moraes; MAI, Tien; DAAMEN, Winnie; FREJINGER, Emma. (2020). *Transportation Research Part C: Emerging Technologies, 114* 681-693. https://doi.org/10.1016/j.trc.2020.02.014 (Published)

Transferring Time-Series Discrete Choice to Link-Based Route Choice in Space: Estimating Vehicle Type Preference using Recursive Logit Model, by BASTIN, Fabian, LIU, Yan, CIRILLO, Cinzia, MAI, Tien. (2018). *Transportation Research Record: Journal of the Transportation Research Board, 2672* (49), 81-90. https://doi.org/10.1177/0361198118796731 (Published)

On the similarities between random regret minimization and mother logit: The case of recursive route choice models, by MAI, Tien; BASTIN, Fabian; FREJINGER, Emma. (2017). *Journal of Choice Modelling, 23* 21-33. https://doi.org/10.1016/j.jocm.2017.03.002 (Published)

A dynamic programming approach for quickly estimating large network-based MEV models, by MAI, Tien; FREJINGER, Emma; FOSGEREAU, Mogens; BASTIN, Fabian. (2017). *Transportation Research Part B: Methodological, 98* 179-197. https://doi.org/10.1016/j.trb.2016.12.017 (Published)

Bike route choice modeling using GPS data without choice sets of paths, by ZIMMERMANN, Maëlle; MAI, Tien; FREJINGER, Emma. (2017). *Transportation Research Part C: Emerging Technologies, 75* 183-196. https://doi.org/10.1016/j.trc.2016.12.009 (Published)

A decomposition method for estimating recursive logit based route choice models, by MAI, Tien; BASTIN, Fabian; FREJINGER, Emma. (2018). *EURO Journal on Transportation and Logistics, 7* (3), 253-275. https://doi.org/10.1007/s13676-016-0102-3 (Published)

A method of integrating correlation structures for a generalized recursive route choice model, by MAI, Tien. (2016). *Transportation Research Part B: Methodological, 93* 146-161. https://doi.org/10.1016/j.trb.2016.07.016 (Published)

A misspecification test for logit based route choice models, by MAI, Tien; FREJINGER, Emma; BASTIN, Fabian. (2015). *Economics of Transportation, 4* (4), 215-226. https://doi.org/10.1016/j.ecotra.2015.08.002 (Published)

A nested recursive logit model for route choice analysis, by MAI, Tien; FOSGERAU, Mogens; FREJINGER, Emma. (2015). *Transportation Research Part B: Methodological, 75* 100-112. https://doi.org/10.1016/j.trb.2015.03.015 (Published)

Conference Proceedings

Inverse factorized soft Q-Learning for cooperative multi-agent imitation learning, by BUI, The Viet; MAI, Tien; NGUYEN, Thanh. (2024.0). *Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS 2024) : Vancouver Canada, December 10-15,* Canada: NeurIPS. (Forthcoming)

Mimicking to dominate : Imitation learning strategies for success in multiagent competitive games, by BUI, The Viet; MAI, Tien; NGUYEN, Hong Thanh. (2024.0). *Proceedings of 38th Annual Conference on Neural Information Processing Systems (NeurIPS 2024) : Vancouver, Canada, December 10-15,* Vancouver, Canada: IEEE. (Accepted)

SPRINQL : Sub-optimal demonstrations driven offline imitation learning, by HOANG, Minh Huy; MAI, Tien; VARAKANTHAM, Pradeep. (2024.0). *Proceedings of 38th Annual Conference on Neural Information Processing Systems (NeurIPS 2024) : Vancouver, Canada, December 10-15,* Vancouver, Canada: NeurIPS. (Accepted)

Tackling Stackelberg network interdiction against a boundedly rational adversary, by MAI, Tien; BOSE, Avinandan; SINHA, Arunesh; NGUYEN, Thanh; SINGH, Ayushman Kumar. (2014.0). *Proceedings of the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024) : Jeju, South Korea, August 3-9,* (pp. 2913-2921) Jeju, South Korea: International Joint Conferences on Artificial Intelligence. https://doi.org/10.24963/ijcai.2024/323 (Published)

Reward penalties on augmented states for solving richly constrained RL effectively, by HAO, Jiang; MAI, Tien; VARAKANTHAN, Pradeep; HOANG, Minh Huy. (2024.0). *Proceedings of the 38th Annual AAAI*

Conference on Artificial Intelligence : Vancouver, Canada, February 20-27, (pp. 19867-19875) Vancouver, Canada: Association for the Advancement of Artificial Intelligence .
https://doi.org/10.1609/aaai.v38i18.29962 (Published)

Imitate the good and avoid the bad: An incremental approach to safe reinforcement learning, by Minh Huy HOANG: Tien MAI; Pradeep VARAKANTHAM. (2024.0). *Proceedings of the 38th Annual AAAI Conference on Artificial Intelligence, Vancouver, Canada,* Vancouver, Canada: Association for the Advancement of Artificial Intelligence (. (Published)

Imitation improvement learning for large-scale capacitated vehicle routing problems, by BUI, The Viet; MAI, Tien. (2023.0). *Proceedings of the 33rd International Conference on Automated Planning and Scheduling (ICAPS 2023): Prague, July 8-13,* (pp. 1-9) Palo Alto, CA: AAAI Press.
https://doi.org/10.1609/icaps.v33i1.27236 (Published)

Imitating opponent to win: Adversarial policy imitation learning in two-player competitive games, by BUI, The Viet; MAI, Tien; NGUYEN, Thanh H.
. (2023.0). *Proceedings of the 22nd International Conference on Autonomous Agents and Multiagent Systems, London, England, 2023 May 29 - June 2,* Taipei: International Foundation for Autonomous Agents and Multiagent Systems. https://doi.org/10.48550/arXiv.2210.16915 (Forthcoming)

Safe delivery of critical services in areas with volatile security situation via a Stackelberg game approach, by MAI, Tien; SINHA, Arunesh. (2023.0). *Proceedings of the 37th AAAI Conference on Artificial Intelligence, Washington, DC, 2023 February 7-14,* (pp. 10-15) Palo Alto, CA: AAAI Press. (Forthcoming)

A fair incentive scheme for community health workers, by BOSE, Avinandan; LI, Tracey; SINHA, Arunesh; MA, Tien. (2023.0). *Proceedings of the 37th AAAI Conference on Artificial Intelligence, Washington, DC, 2023 February 7-14,* (pp. 1-12) Palo Alto, CA: AAAI Press. (Accepted)

A logistic regression and linear programming approach for multi-skill staffing optimization in call centers, by TA, Thuy Anh; MAI, Tien; BASTIN, Fabian; l'ECUYER, Pierre . (2022.0). *2022 Winter Simulation Conference: Singapore, December 11-14: Proceedings,* (pp. 1-12) Piscataway, NJ: IEEE.
https://doi.org/10.1109/WSC57314.2022.10015281 (Published)

Scalable distributional robustness in a class of non convex optimization with guarantees, by BOSE, Avinandan; SINHA, Arunesh; MAI, Tien. (2022.0). *Proceedings of the 36th Conference on Neural Information Processing Systems, New Orleans, United States, 2022 November 28 - December 9,* (pp. 1-26) New Orleans, United States: Curran Associates. (Published)

Choices are not independent: Stackelberg security games with nested quantal response models, by MAI, Tien; SINHA, Arunesh. (2022.0). *Proceedings of the 36th AAAI Conference on Artificial Intelligence (AAAI) 2022, Virtual, Vancouver, Canada, February 22 - March 1,* (pp. 1-9) Palo Alto, CA: AAAI Press. (Accepted)

Research Grants

Singapore Management University

Sparsity-constraints and Regularization for Sequential Decision-making, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): MAI Anh Tien, 2020, S$91,340

Work in Progress

MAI Anh Tien, Thuy Anh Ta, Tien Thanh Dam, Robust Maximum Capture Facility Location under Random Utility Models , 2021

MAI Anh Tien, Andrea LODI, A general algorithm for assortment optimization under random utility models, 2020

MAI Anh Tien, Patrick Jaillet, Enhancing inverse reinforcement learning with weighted causal entropy, 2020

MAI Anh Tien, Emma Frejinger, Estimation of Undiscounted Recursive Path Choice Models: Convergence Properties and Algorithms, 2020

MAI Anh Tien, Quoc Phong Nguyen, Kian Hsiang Low, Patrick Jaillet, Inverse reinforcement learning with missing dats, 2020

MAI Anh Tien, Patrick Jaillet, On the relation between Markov Decision Process frameworks, 2020

MAI Anh Tien, Patrick Jaillet, Robust entropy-regularized Markov Decision Processes, 2020

MAI Anh Tien, Patrick Jaillet, Robust product-line pricing under generalized extreme value models, 2020

TEACHING

Courses Taught

Singapore Management University

Undergraduate Programmes :

    Algorithms and Programming

    Computational Thinking

    IS Project Experience (Applications)

    Web Application Development I

Postgraduate Research Programmes :

    Empirical Research Project 1

    Empirical Research Project 2