

Mengtao (Tomy) LYU, Ph.D.

Georgia Institute of Technology, Atlanta, GA, USA

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Postdoctoral Fellow & Course Instructor

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Research Interests: Human-AI Teaming | Human Factors | Transportation Safety | Bio-signal Analysis

Education

Ph.D., Human Factors Engineering, The Hong Kong Polytechnic University, 2022 - 2025

Thesis: *Visual attention-based pilots' status monitoring and performance enhancement towards human-in-the-loop automation*

Committee: Fan Li, Gangyan Xu, Wei Liu, Chia-Fen Chi, Alan H.S. Chan

M.Sc., Supply Chain / Intelligent Systems, Nanyang Technological University, 2020 - 2021

Dissertation: *A Crowdsourcing-based Continuous Enrichment Method for Industrial Knowledge Graph: Achieving Knowledge-As-A-Service in Smart Manufacturing*

Supervisor: Chun-Hsien Chen

B.Eng. Software Engineering & B.Art. Japanese, Dalian University of Technology, 2013 - 2017

Capstone Project: *Warehouse management and Production Plan System based on SAP R/3*

Employment

Academia

- | | |
|------------|---|
| 2025 - Now | Georgia Institute of Technology , Atlanta, GA, USA
Postdoctoral Fellow (2025 - Now) — PI: Mengyao Li; Jamie Gorman
Adjunct Course Instructor (Spring 2026) |
| 2025 | Nanyang Technological University , Singapore
Research Fellow (Human Factors) — PI: Mir Feroskhan |

Industry

- | | |
|-------------|---|
| 2019 - 2020 | Asics China Trading Co., Ltd. , Shanghai, China
IT Supervisor |
| 2017 - 2019 | ABeam Global Development Centre (Shanghai) Co., Ltd. , Shanghai, China
SAP Consultant |

Honors & Awards (Selected)

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| 2025 | Outstanding Student Project Award , The Hong Kong Ergonomics Society (HKES) |
| 2025 | Inspiring, Innovative and Pioneering Research , Tobii |
| 2025 | IEA/Kingfar Student Award , The International Ergonomics Association (IEA) |

Publications (*on separate pages*)

Funding

External Awards

- F13. **Defense Advanced Research Projects Agency (DARPA), Bio-Behavioral Team Dynamics Measurement System (BioTDMS)** (Total amount: US\$2,843,901).
Role: Key member. Period: 2025 - 2026. [Co-PI: Mengyao Li; PI: Jamie Gorman]
- F12. **Department of Transportation (DoT), National Center on The Future of Travel Behavior and Demand From Perception to Policy: Measuring Road Driver Behavior and Public Support for Autonomous Truck** (Total amount: US\$ 216,628).
Role: Key member. Period: 2026. [Co-PI: Mengyao Li; PI: Sofía Pérez-Guzmán]
- F11. **International Centre for Aviation Innovation (ICAI) Singapore, Multi Sector Planning** (Total amount: SG\$4,000,000).
Role: Key member. Period: 2025. [PI: Mir Feroskhan]
- F10. **University Grants Committee (UGC), Early Career Scheme (ECS), Looking but Not Seeing? Mitigating Inattention Blindness in Remote Digital Towers for Safe and Watchful Air Traffic Control** (Total amount: HK\$557,571).
Role: Project member. Period: 2025. [PI: Fan Li]
- F9. **National Natural Science Foundation of China (NSFC), Young Scientists Fund, Research on the Degradation Mechanism of Pilot Vigilance in Response to Dynamic Task Workload Conditions** (Total amount: CNY300,000).
Role: Key member. Period: 2025. [PI: Fan Li]
- F8. **Commercial Aircraft Corporation of China, Ltd. (COMAC), AI-driven Virtual Co-Pilots in Aviation** (Total amount: CNY500,000).
Role: Project member. Period: 2025. [PI: Fan Li]
- F7. **Hong Kong Productivity Council (HKPC), Smart Traffic Fund (STF), Driving Style-based Adaptive Virtual Training Platform: Build Safe Human Driving Habits in Autonomous Driving** (Total amount: HK\$1,974,381).
Role: Key member. Period: 2023 - 2025. [PI: Fan Li]
- F6. **National Research Foundation (NRF) Singapore, Stakeholder – oriented innovative user-centric design and solution generation (SCO-RP1)** (Total amount: SG\$817,500).
Role: Key member. Period: 2020 - 2021. [PI: Chun-Hsien Chen]

Internal Awards

- F5. **Georgia Tech Research Institute (GTRI), Trust Contagion in Multi-Human Multi-Agent Teams** (Total amount: US\$140,000).
Role: Project member. Period: 2025 - 2026. [PI: Mengyao Li]
- F4. **Hong Kong Polytechnic University, Investigating Pilots' Decision-making and Cognitive Performance in Response to Acute Stress** (Total amount: HK\$500,000).
Role: Key member. Period: 2023 - 2025. [PI: Fan Li]
- F3. **Hong Kong Polytechnic University, Teaching Development Grant, Improved Student Attention and Engagement via Visual Attention Analytics-based Slides and Lesson Plan Design** (Total amount: HK\$371,729.04).
Role: Project member. Period: 2023 - 2024. [PI: Fan Li]
- F2. **Hong Kong Polytechnic University, Start-up Fund, Visual Attention Analytics in Aviation Automation via Deep Learning Model** (Total amount: HK\$500,000).
Role: Key member. Period: 2022 - 2024. [PI: Fan Li]
- F1. **Hong Kong Polytechnic University, Start-up Fund, Psychophysiological Data-based Knowledge Transfer Model for Adaptive Training** (Total amount: HK\$550,000).
Role: Key member. Period: 2021 - 2023. [PI: Fan Li]

Proposal under review

- Foo. **HUO Family Foundation, Early Career Foundation**, *Does AI Make Young Minds Lazy, Even Behind the Wheel?* (Applied amount: US\$268,358).
Role: **PI**. [Advisor: Mengyao Li; Mentor: Bruce Walker]
- Foo. **Hong Kong Productivity Council (HKPC), Smart Traffic Fund (STF)**, *Developing Age-Friendly ADAS Warning to Mitigate Mutual Expectation Mismatch among Older Drivers in Hong Kong* (Applied amount: HK\$4,900,000).
Role: Key member. [PI: Fan Li]

Invited Talks & Panel Discussions

- IT6. **“Human-Centered AI for Safe and Resilient Aviation: Sensing, Explaining, and Teaming”**. (Invited Seminar). The Hong Kong University of Science and Technology (Guangzhou). Aug TBC, 2026.
- IT5. **“Enhancing Pilot Performance Through Eye-Tracking and AI: A Closed-Loop Approach to Aviation Safety”**. (Awardee Presentation). The Hong Kong Ergonomics Society (HKES). May 30, 2026.
- IT4. **“Interactive Robotics and Human-Centered Design”**. (Presenter and Panelist). Center for Human-AI-Robot Teaming (CHART), Georgia Tech. May 05, 2026.
- IT3. **“Learning as a System: Brain, Body, and Design”**. (Presenter and Panelist). Faculty Panel and Lunch, Georgia Tech. March 17, 2026.
- IT2. **“Through the Lens of Situation Awareness: The Promise and Peril of Generative AI for HCI in Autonomous Driving”**. (Invited Speaker). HFES Human-AI-Robot Teaming Technical Group Monthly Member Conversation. February 27, 2026.
- IT1. **Panel talk: Career development of PhD students in Engineering Psychology**. (Panelist). HFES-Georgia Tech Student Chapter. October 29, 2025.

Teaching & Mentorship

Courses Taught

Instructor, Georgia Institute of Technology

- CT4. **Science of Occupational Health and Safety (UG, COS2801)**, 2026, Adjunct Course Instructor.

Teaching Assistant, The Hong Kong Polytechnic University

- CT3. **Human Factors, Accident Prevention and Aircraft Maintenance (PG, AAE5002)**, 2023, Teaching Assistant.
- CT2. **Human Factors in Aviation (UG, AAE4903)**, 2023, Teaching Assistant.
- CT1. **Safety, Reliability and Compliance (UG, AAE3006)**, 2022, Teaching Assistant.

Advising & Mentoring

Serving on committee for thesis/dissertation

- 2026 - Now **Nina Otebele**, Georgia Institute of Technology
Master Thesis: *Cognitive Engineering Approach to Improving Ground Data System Interfaces for Mission Operators*

Mentoring

2026 - Now	PSYC 2270 - Engineering Psychology , Georgia Institute of Technology <i>Serving as an external mentor for the student projects</i>
2025 - Now	Mercedes P. Ramesh , Nanyang Technological University PhD Thesis: <i>Adaptive Automation Levels in Air Traffic Control: Balancing Human Workload, Situation Awareness, and Performance</i>
2023 - Now	Yiteng Sun , Hong Kong Polytechnic University PhD Thesis: <i>Trainer of Trainer: Leveraging Expert Knowledge to Enhance Human–Vehicle Collaboration in Semi-Autonomous Driving</i>
2022 - 2025	ZhiminLi , Hong Kong Polytechnic University PhD Thesis: <i>Seeing the Unseen Through Fixation Dynamics: Large Language Model-Augmented Detection Failure Analytics in Air Traffic Control</i>
2023 - 2024	Henry Chan , Hong Kong Polytechnic University Master Dissertation: <i>The Correlation between Auditory Density and OOTL Phenomenon through Gaze Pattern Behaviours</i>
2023 - 2024	Cheung, Choi, & Kwok , Hong Kong Polytechnic University Capstone Project (FYP): <i>Investigating Eye Movement Patterns for identifying Out of the Loop (OOTL) phenomenon in Aviation</i>
2022 - 2023	Leung, Tsang, & Lam , Hong Kong Polytechnic University Capstone Project (FYP): <i>Factors of gaze patterns that differentiate novice and experienced pilots</i>

Service, Outreach, Society, & Other Professional Engagements

Peer Review

Journal Reviewing

2026 -	International Journal of Human-Computer Studies (IJHCS)
2026 -	International Journal of Industrial Ergonomics (IJIE)
2026 -	Ergonomics
2025 -	Engineering Applications of Artificial Intelligence (EAAI)
2025 -	Advanced Engineering Informatics (ADVEI)
2025 -	IEEE Transactions on Human-Machine Systems (IEEE-THMS)
2025 -	International Journal of Human-Computer Interaction (IJHCI)
2025 -	Knowledge-Based Systems (KBS)
2024 -	Computers & Industrial Engineering (CAIE)

Conference Reviewing

2026 -	ACM International Conference on Multimedia (ACMMM)
2026 -	ASPIRE International Annual Meeting (HFES)
2026 -	IEEE International Conference on Human-Machine Systems (ICHMS)

- 2024 - International Conference on Human-Computer Interaction (HCII)
2023 - IEEE International Conference on Cyberworlds (CW)
2023 - International Conference on Transdisciplinary Engineering (ISTE)

Professional Associations

- 2026 - * **Human Factors and Ergonomics Society (HFES)**
Human-AI-Robot Teaming Technical Group (Member, 2026 - *)
- 2025 - * **Association for Computing Machinery (ACM)**
SIGCHI (Member, 2025 - *)
- 2025 - * **Institute of Electrical and Electronics Engineers (IEEE)**
Systems, Man, and Cybernetics (SMC) Society (Member, 2025 - *)
- 2024 - * **The Hong Kong Ergonomics Society (HKES)**
Member, 2025 - *
Student Member, 2024 - 25
- 2024 - * **Chinese Ergonomics Society (CES)**

Professional References

Alan H.S. Chan
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University of Hong Kong*
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Chun-Hsien Chen
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Publications

* = Corresponding author; † = Equal contribution

@ = Supervisor/Mentor; # = Internal Collaborator; \$ = External Collaborator; % = Advising Student

Representative Publications (last 5 years)

- R1. **Mengtao Lyu** and F. Li@*, “Do you need help? Identifying and responding to pilots’ troubleshooting through eye-tracking and Large Language Model.” *International Journal of Human-Computer Studies*, p. 103617, 2025. (JCR Q1, IF = 6.0, Top10%, CCF-A)
- R2. **Mengtao Lyu**, F. Li@*, C.-H. Lee\$, and C.-H. Chen@\$, “VALIO: Visual attention-based linear temporal logic method for explainable out-of-the-loop identification.” *Knowledge-Based Systems*, vol. 299, p. 112086, 2024. (JCR Q1, IF = 8.0)
- R3. **Mengtao Lyu**, F. Li@*, X. Qu\$, and Q. Li#, “Flashlight model: Integrating attention distribution and attention resources for pilots’ visual behaviour analysis and performance prediction.” *International Journal of Industrial Ergonomics*, vol. 103, p. 103630, 2024. (JCR Q1, IF = 3.6)
- R4. **Lyu Mengtao**, L. Fan@*, X. Gangyan@, and H. Su#, “Leveraging eye-tracking technologies to promote aviation safety—A review of key aspects, challenges, and future perspectives.” *Safety Science*, vol. 168, p. 106295, 2023. (JCR Q1, IF = 6.2)
- R5. **Mengtao Lyu**, X. Li@*, and C.-H. Chen@, “Achieving Knowledge-as-a-Service in IIoT-driven smart manufacturing: A crowdsourcing-based continuous enrichment method for Industrial Knowledge Graph.” *Advanced Engineering Informatics*, vol. 51, p. 101494, 2022. (JCR Q1, IF = 11.5, Top 5%)

Other Peer-Reviewed Journal Articles

- J6. Y. Deng#†, **Mengtao Lyu**†, J. Gao#, J. Xiao#, and M. Feroskhan@*, “TRUST-UP: Trustworthy Reinforcement Learning Using Safe Techniques for UAV Pursuit,” *Advanced Engineering Informatics*, vol.76, p. 104963, 2026. (JCR Q1, IF = 11.5, Top 5%)
- J5. Z. Li%, **Mengtao Lyu**, F. Li@*, H. Qiao#, T. Yang#, and C.-H. Chen@, “Predicting detection failures in air traffic control: Leveraging fixation-state transitions and LLM-driven probabilistic threshold tuning.” *Advanced Engineering Informatics*, vol.76, p. 104998, 2026. (JCR Q1, IF = 11.5, Top 5%)
- J4. Y. Sun%, D. Li%, S. Han#, **Mengtao Lyu**, and F. Li@*, “ARHUD Design for Dynamic Spatial Information Presentation to Improve Driver Situation Awareness of Blind Spots.” *International Journal of Human-Computer Studies*, p. 103793, 2026. (JCR Q1, IF = 6.0, Top10%, CCF-A)
- J3. Z. Li%, F. Li@*, and **Mengtao Lyu**, “Tracking the Unseen and Unaware: Deciphering Controllers’ Detection Failures to Warnings Through Eye-Tracking Metrics.” *International Journal of Human-Computer Interaction*, pp. 1-20, 2025. (JCR Q1, IF = 6.1, Top 10%)
- J2. Q. Li#, K. K. Ng#*, C. Simon#, C. Y. Yiu#, and **Mengtao Lyu**, “Recognising situation awareness associated with different workloads using EEG and eye-tracking features in air traffic control tasks.” *Knowledge-Based Systems*, vol. 260, p. 110179, 2023. (JCR Q1, IF = 8.0)
- J1. X. Li@*, **Mengtao Lyu**, Z. Wang#, C.-H. Chen@, and P. Zheng\$, “Exploiting knowledge graphs in industrial products and services: A survey of key aspects, challenges, and future perspectives.” *Computers in Industry*, vol. 129, p. 103449, 2021. (JCR Q1, IF = 10.0, Top 10%)

Conference Proceedings (peer-reviewed)

- C10. Z. Zhang#, J. Yan#, Y. Sun%, D. Li#, S. Feng\$, **Mengtao Lyu***, F. Li @, “CoDriveMind: Behavior-Aware Multimodal Reasoning for Human–Machine Co-Driving Understanding.” In *Proceedings of the 33rd ACM International Conference on Multimedia*, 2026, Accepted.

- C9. **Mengtao Lyu**, E. Rojas[#], M. Li^{@*}, B. Bracken^{\$}, N. Cooke^{\$}, P. Desrochers^{\$}, J. Gorman^{\$}, L. Huang^{\$}, M. Kilcullen^{\$}, M. Rosen^{\$}, M. Scalia^{\$}, G. A. Yadav^{\$}, X. Yin^{\$}, E. Zahmat Doost^{\$}, and S. Zhou^{\$}, “Beyond Dyads: Machine Learning for Team Performance Prediction in Multi-Member Teams.” In *ASPIRE International Annual Meeting (HFES 2026)*, SAGE Publications, 2026, Accepted.
- C8. E. Rojas[#], **Mengtao Lyu**, M. Li^{@*}, B. Bracken^{\$}, N. Cooke^{\$}, P. Desrochers^{\$}, J. Gorman^{\$}, L. Huang^{\$}, M. Kilcullen^{\$}, M. Rosen^{\$}, M. Scalia^{\$}, G. A. Yadav^{\$}, X. Yin^{\$}, E. Zahmat Doost^{\$}, and S. Zhou^{\$}, “Identifying Latent Processes in Multi-Modal Physiological Signals for Team Performance: An Exploratory Approach.” In *ASPIRE International Annual Meeting (HFES 2026)*, SAGE Publications, 2026, Accepted.
- C7. **Mengtao Lyu**^{*} and Q. Li^{\$}, “Methodological Challenges in Human Factors Research for Air Traffic Management.” In *2026 IEEE International Conference on Human-Machine Systems (ICHMS)*, pp. 71-76. IEEE, 2026.
- C6. Q. Li^{\$*}, C.Y. Yiu^{\$}, X. Yuan^{\$}, and **Mengtao Lyu**, “The Transparency of Insights Into Cockpit Evolution for Future Single-Pilot Operation: Evidence from Eye Tracker Patterns.” In *2026 IEEE International Conference on Human-Machine Systems (ICHMS)*, pp. 83-88. IEEE, 2026.
- C5. M. P. Ramesh[%], **Mengtao Lyu**^{*}, I. Dhief[#], Z. Li[%], and M. Feroskhan[@], “Human-AI Decision Support for Sustainable ATCO Workload: Forecast-Informed, Bilevel-Optimized Task-Load Estimation.” In *International Conference on Human-Computer Interaction*, pp. 221-237. Cham: Springer Nature Switzerland, 2026.
- C4. Z. Li[%], M.-H. Hsieh[#], M. P. Ramesh[%], I. Dhief[#], **Mengtao Lyu**, and M. Feroskhan^{@*}, “How Multi-Sector Planning Shapes Shared Situation Awareness among Air Traffic Controllers: A Team-level Eye-tracking Evaluation.” In *International Conference on Human-Computer Interaction*, pp. 165-176. Cham: Springer Nature Switzerland, 2026.
- C3. Y. Sun[%], D. Dillion^{\$}, K. Gray^{\$}, **Mengtao Lyu**, Z. Zhang[#], and F. Li^{@*}, “From Expectation to Evaluation: Expectation Cues Systematically Bias LLM and Human Judgment.” In *CHI '26: Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems*, ACM, 2026.
- C2. **Mengtao Lyu** and F. Li^{@*}, “Patterning Risk: An Innovative Task Design Method for Simulating Incidents in Transportation Studies.” In *Advances in Human Factors of Transportation*, vol. 148, AHFE Open Access, 2024.
- C1. **Mengtao Lyu**, F. Li^{@*}, and C.-H. Lee^{\$}, “The effects of adaptive automation on pilots’ flight control performance and visual attention distribution.” In *Leveraging Transdisciplinary Engineering in a Changing and Connected World*, IOS Press, 2023, pp. 82-91.

Under Review and In Revision

- UR1. Q. Li[#], X. Yuan[#], K. K. Ng[#], and **Mengtao Lyu**^{*}, “Translating gaze-based human reliability evidence into cockpit safety functions: A transparent pathway from dual-pilot cockpit hindrance to single-pilot flight deck evolution.” *Reliability Engineering & System Safety*, under review (1st), 2026.
- UR2. **Mengtao Lyu**, E. Rojas[#], M. Li^{@*}, X. Yin^{\$}, E. Zahmat Doost^{\$}, B. Bracken^{\$}, N. Cooke^{\$}, P. Desrochers^{\$}, L. Huang^{\$}, M. Kilcullen^{\$}, M. Rosen^{\$}, M. Scalia^{\$}, W. Aaron^{\$}, G. A. Yadav^{\$}, S. Zhou^{\$}, and J. Gorman^{\$}, “Predicting team performance with multimodal data using a Dual Attention framework and identifying critical psychophysiological features.” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, under review (1st), 2026.