Dr. Yuqian Lu

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Professional Appointments

2022 – on	**Senior Lecturer** Department of Mechanical and Mechatronics Engineering Faculty of Engineering The University of Auckland, New Zealand
2019 – 2021	**Lecturer** Department of Mechanical and Mechatronics Engineering Faculty of Engineering The University of Auckland, New Zealand
2017 – 2019	**Product Manager/R&D Lead** FRAMECAD Ltd., New Zealand
2016 – 2017	**Business Analyst/Software Developer** FRAMECAD Ltd., New Zealand
2015 – 2016	**Business Analyst** Compact Sorting Equipment, New Zealand

Education

2012 – 2016	**PhD in Mechatronics Engineering**, The University of Auckland, New Zealand
2007 – 2012	**Bachelor in Mechatronics Engineering**, Dalian University of Technology, China

Grants

My research has been funded by:
- New Zealand and China government agencies
- New Zealand industry partners through strategic research development and knowledge transfer
- The University of Auckland

In total, I have generated grants totalling >**$610,000** (NZD) as principal investigator (PI) and I have participated in grants totalling >**$2,023,000** (NZD) as an associate investigator (AI) - altogether managed >**$2,633,000** (NZD) grants.

Awards & Honours

2021	**Best Paper Award**, Robotics and Computer-Integrated Manufacturing
2014	**Best Paper Shortlist**, IEEE International Conference on Industrial Engineering and Engineering Management
2010	**Tertiary Student of the Year (finalist, 100 students)**, Ministry of Education, China
2009	**Top10 Tertiary Student of the Year**, Department of Education, Liaoning Province, China
(2008,2011)	**National Scholarship**, Ministry of Education, China

Academic Service

Editorship

2020 – on	Associate Editor, *IET Collaborative Intelligent Manufacturing*
2021	Managing Guest Editor, *Robotics and Computer-Integrated Manufacturing*
2021	Guest Editor, *Neural Computing and Applications*

Committees

2021 – on	NAMRI/SME (The North American Manufacturing Research Institution of SME) Scientific Committee
2021 – on	IEEE RAS Technical Committee on Digital Manufacturing and Human-Centred Automation

Professional Committee Membership

2018 – on	Member, American Society of Mechanical Engineers
2019 – on	Member, Society of Manufacturing Engineers
2020 – on	Member, Institute of Electrical and Electronics Engineers

Chair/Committee, International Conferences

- **Local Organisation Chair**, 2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)
- **Special Session Chair**, 2022 IEEE 18th International Conference on Automation Science and Engineering (CASE)
- **Organiser**, Symposium on Cloud Manufacturing at 2022 ASME MSEC Manufacturing Science and Engineering Conference
- **Session Chair**, 2020 IEEE 16th International Conference on Automation Science and Engineering (CASE)
- **Committee Member**, The 48th International Conference on Computers and Industrial Engineering
- **Special Session Organiser**, The 48th International Conference on Computers and Industrial Engineering
- **Organiser**, Symposium on Cognitive Manufacturing at 2020 ASME MSEC Manufacturing Science and Engineering Conference

Grant Assessor

- Fundamental Research Programme, University of Mons, Belgium
- National Research and Development Agency, Chile

Reviewer

- IEEE Transactions on Automation Science and Engineering
- Journal of Manufacturing Systems
- Journal of Intelligent Manufacturing
- International Journal of Production Research
- ASME Journal of Manufacturing Science and Engineering
- Robotics and Computer-Integrated Manufacturing
- Human-centric Computing and Information Sciences
- SME Manufacturing Letters
- Computers in Industry
- IEEE Transactions on Industrial Informatics
- Advanced Engineering Informatics
- Engineering

- IEEE Access

Teaching

Undergraduate

2019 – on	MECHENG352: Manufacturing Systems Course Coordinator, (50% of module)
2019 – on	MECHENG752: Technology Management ($\sim$30% of module)
2020 – on	MECHENG709: Industrial Automation (50% of module)
2022 – on	MECHENG754: Industry 4.0 Smart Manufacturing (33% of module)

Postgraduate

2020 – on	MECHENG710: Advanced Industrial Automation (25% of module)
2020 – 2021	MECHENG751: Advanced CAD/CAM/CNC (50% of module)
2022 – on	MECHENG753: Advanced Industry 4.0 Smart Manufacturing (33% of module)

Student supervision (Main Supervisor)

Current Students (20)

PhD Students (**10**)

2022 – on	Regina Lee | Jiaxu Niu
2021 – on	Yonghui Tao | Dazzle Johnson | Akhil Ramesh | Wanqing Xia
2020 – on	Zengkun Liu | Hao Zheng | Saahil Chand
2019 – on	Zhaojun Qin

Master Students - Research Thesis (**1**)

2022 – on	Joshua Goh

MEngSt Students - Research Project (**1**)

2022 – on	Cooper Li

Undergraduate Honours Students (**8**)

2022 – on	Andrew Fairweather | Tom Grimwood | Jae Lee | Sheung Ip Jonas Wan | Eric Che | Benedict Loeng | Nageesh Sharma | Robert Tate

Alumni (30)

Master Students - Research Thesis (**3**)

2022	Karen Wang | Sidhant Raje
2021	Munirah Mahadi
2020	Ziwei Su

MEngSt Students - Research Project **(4)**

| 2020 | Akhilnandh Ramesh | Dinghe Liu | Leon Rodrigues | Jiaxu Niu |

Undergraduate Honours Students **(23)**

| 2021 | Regina Lee | Zifan Li | Josh Fenn | Raani Kelderman | Molina Vincent | Keegan Fernandes | Sam McGillicudy | Walter Xu |

| 2020 | Morgan Davies | Reuben Hughes | Finn O'Brien | Blake Wagstaff | Hamish Marsden | Stephen Monaghan | Joshua Stanaway | Zhuoyun Zhang | Yonghui Tao | Nimesha Witharana | Anna Saunders |

| 2019 | Joshua Goh | Wanqing Xia | Nikhil Harilal | Steve Tran |

Media & Outreach

| 2021 | Interviewed by The University of Auckland, *"A robot to help workers on the factory floor"*: a-robot-to-help-workers-on-the-factory-floor |
| 2021 | Interviewed by Facteon, *"Customer Stories: University of Auckland: Flexible & Mobile Automation for Manufacturers"*: university-of-auckland-flexible-and-mobile-automation-for-manufacturers |

Presentations

Invited & Keynotes

2021	Manufacturing Smarter after the Pandemic, *Tech Tuesday*. Recording: ▶ youtube.com/watch?v=UWdSxRgcppI
	Manufacturing Business Innovation Driven by Deep Tech Disruption, *Callaghan Innovation Morning Talks*.
	Commuication, Coordination and Control in Smart Manufacturing Systems, *Overseas Scientist Forum, Huazhong University of Science and Technology*.
	Manufacturing Paradigm Shifts and Impact on Future Talents, *Donghua University*.
2019	Manufacturing Intelligence in the Era of Industry 4.0, *Donghua University*.
	Smart Manufacturing and Artificial Intelligence, *Jiangsu University*.

Publications

Peer-reviewed Articles

[65] Guo, L., Yan, F., Li, T., Yang, T., **Lu, Y.,** "An automatic method for constructing machining process knowledge base from knowledge graph," *Robotics and Computer-Integrated Manufacturing*, vol. 73, 2022. DOI: 10.1016/j.rcim.2021.102222.

[64] Liu, C., Su, Z., Xu, X., **Lu, Y.,** "Service-oriented industrial internet of things gateway for cloud manufacturing," *Robotics and Computer-Integrated Manufacturing*, vol. 73, 2022. DOI: 10.1016/j.rcim.2021.102217.

[63] Liu, S., Sun, Y., Zheng, P., **Lu, Y.,** Bao, J., "Establishing a reliable mechanism model of the digital twin machining system: An adaptive evaluation network approach," *Journal of Manufacturing Systems*, vol. 62, pp. 390–401, 2022. DOI: 10.1016/j.jmsy.2021.12.008.

[62] Liu, T., Wang, J., Huang, X., **Lu, Y.,** Bao, J., "3dsmda-net: An improved 3dcnn with separable structure and multi-dimensional attention for welding status recognition," *Journal of Manufacturing Systems*, vol. 62, pp. 811–822, 2022. DOI: 10.1016/j.jmsy.2021.01.017.

[61] **Lu, Y.**, Wang, L., Bao, J., Lastra, J., Ameri, F., "Semantic artificial intelligence for smart manufacturing automation," *Robotics and Computer-Integrated Manufacturing*, 2022. DOI: 10.1016/j.rcim.2022.102333.

[60] **Lu, Y.**, Zheng, H., Chand, S., "Outlook on human-centric manufacturing towards industry 5.0," *Journal of Manufacturing Systems*, vol. 62, pp. 612–627, 2022. DOI: 10.1016/j.jmsy.2022.02.001.

[59] Wang, H., Tao, J., Peng, T., "Dynamic inventory replenishment strategy for aerospace manufacturing supply chain: Combining reinforcement learning and multi-agent simulation," *International Journal of Production Research*, 2022. DOI: 10.1080/00207543.2021.2020927.

[58] Zhou, B., Shen, X., **Lu, Y.,** "Semantic-aware event link reasoning over industrial knowledge graph embedding time series data," *International Journal of Production Research*, 2022. DOI: 10.1080/00207543.2021.2022803.

[57] Aheleroff, S., Xu, X., Zhong, R., **Lu, Y.**, "Digital twin as a service (dtaas) in industry 4.0: An architecture reference model," *Advanced Engineering Informatics*, vol. 47, 2021. DOI: 10.1016/j.aei.2020.101225.

[56] Fan, W., Zheng, L., Ji, W., Xu, X., **Lu, Y.**, Wang, L., "A machining accuracy informed adaptive positioning method for finish machining of assembly interfaces of large-scale aircraft components," *Robotics and Computer-Integrated Manufacturing*, vol. 67, 2021. DOI: 10.1016/j.rcim.2020.102021.

[55] Guo, L., Yan, F., **Lu, Y.**, Zhou, M., Yang, T., "An automatic machining process decision-making system based on knowledge graph," *International Journal of Computer Integrated Manufacturing*, vol. 34, no. 12, pp. 1348–1369, 2021. DOI: 10.1080/0951192X.2021.1972461.

[54] Guo, L., Zhou, M., **Lu, Y.**, Yang, T., Yang, F., "A hybrid 3d feature recognition method based on rule and graph," *International Journal of Computer Integrated Manufacturing*, vol. 34, no. 3, pp. 257–281, 2021. DOI: 10.1080/0951192X.2020.1858507.

[53] Huang, H., Yang, L., Wang, Y., Xu, X., **Lu, Y.,** "Digital twin-driven online anomaly detection for an automation system based on edge intelligence," *Journal of Manufacturing Systems*, vol. 59, pp. 138–150, 2021. DOI: 10.1016/j.jmsy.2021.02.010.

[52] Liu, S., Bao, J., **Lu, Y.**, Li, J., **Lu, S.**, Sun, X., "Digital twin modeling method based on biomimicry for machining aerospace components," *Journal of Manufacturing Systems*, vol. 58, pp. 180–195, 2021. DOI: 10.1016/j.jmsy.2020.04.014.

[51] Liu, S., **Lu, S.**, Li, J., Sun, X., **Lu, Y.**, Bao, J., "Machining process-oriented monitoring method based on digital twin via augmented reality," *International Journal of Advanced Manufacturing Technology*, vol. 113, no. 11-12, pp. 3491–3508, 2021. DOI: 10.1007/s00170-021-06838-5.

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[46] Qin, Z., **Lu, Y.,** "Self-organizing manufacturing network: A paradigm towards smart manufacturing in mass personalization," *Journal of Manufacturing Systems*, vol. 60, pp. 35–47, 2021. DOI: 10.1016/j.jmsy.2021.04.016.

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[43] Zhou, B., Hua, B., Gu, X., "An end-to-end tabular information-oriented causality event evolutionary knowledge graph for manufacturing documents," *Advanced Engineering Informatics*, vol. 50, 2021. DOI: 10.1016/j.aei.2021.101441.

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[41] Fan, W., Zheng, L., Ji, W., "Function block-based closed-loop adaptive machining for assembly interfaces of large-scale aircraft components," *Robotics and Computer-Integrated Manufacturing*, vol. 66, 2020. DOI: 10.1016/j.rcim.2020.101994.

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Book Chapters

[20] Zhang, R., Bao, J., **Lu, Y.**, Li, J., Lv, Q., "Human-robot collaborative assembly based on cps," in *Cyber-Physical Systems*, CRC Press, 2022, pp. 71–85.

[19] Aheleroff, S., Polzer, J., Huang, H., "Smart manufacturing based on digital twin technologies," in *Industry 4.0*, CRC Press, 2020, pp. 77–122.

Peer-reviewed Conference Proceedings

[18] Chand, S., McDaid, A., **Lu, Y.**, "Isometric-based approach for detecting localized muscular fatigue during complex dynamic manufacturing operations," vol. 2021-August, 2021, pp. 1940–1945. DOI: 10.1109/CASE49439.2021.9551478.

[17] Liu, S., Shen, H., Li, J., **Lu, Y.**, Bao, J., "An adaptive evolutionary framework for the decision-making models of digital twin machining system*," vol. 2021-August, 2021, pp. 771–776. DOI: 10.1109/CASE49439.2021.9551595.

[16] Qin, Z., **Lu, Y.**, "Multi-agent-based self-organizing manufacturing network towards mass personalization," vol. 2, 2021. DOI: 10.1115/MSEC2021-63990.

[15] Flores, E., Xu, X., **Lu, Y.**, "A reference human-centric architecture model: A skill-based approach for education of future workforce," vol. 48, 2020, pp. 1094–1101. DOI: 10.1016/j.promfg.2020.05.150.

[14] ——, "Human cyber-physical systems: A skill-based correlation between humans and machines," vol. 2020-August, 2020, pp. 1313–1318. DOI: 10.1109/CASE48305.2020.9216843.

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[10] Xia, W., Goh, J., Cortes, C., **Lu, Y.**, Xu, X., "Decentralized coordination of autonomous agvs for flexible factory automation in the context of industry 4.0," vol. 2020-August, 2020, pp. 488–493. DOI: 10.1109/CASE48305.2020.9216961.

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[6] Mubarok, K., Xu, X., Ye, X., Zhong, R., **Lu, Y.,** "Manufacturing service reliability assessment in cloud manufacturing," vol. 72, 2018, pp. 940–946. DOI: 10.1016/j.procir.2018.03.074.

[5] Wardhani, R., Mubarok, K., Mucha, C., Kubota, T., **Lu, Y.**, Xu, X., "A review on digital twin in manufacturing process," vol. 2018-December, 2018.

[4] **Lu, Y.**, Peng, T., Xu, X., "Cyber-physical production network for energy-efficient manufacturing: A framework," 2017.

[3] **Lu, Y.**, Xu, X., "Process and production planning in a cloud manufacturing environment," vol. 2, 2015. DOI: 10.1115/MSEC20159382.

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