

Jing (Roy) Yang

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Education

Queensland University of Technology (QUT) <i>Ph.D.</i>	Brisbane, Australia 2019–2023
Sun Yat-sen University <i>Master of Engineering in Computer Science and Technology</i>	Guangzhou, China 2016–2019
Sun Yat-sen University <i>Bachelor of Engineering in Software Engineering</i>	Guangzhou, China 2012–2016

Awards and Scholarships

Best PhD Dissertation Award

International Conference on Business Process Management Sept 2024
Awarded for my doctoral thesis completed in 2023 in the fields of process mining and business process management (BPM). The International Conference on Business Process Management (CORE ranking A) is the premier conference for researchers and practitioners in the field of business process management. Winner for the Best PhD Dissertation Award is selected based on the originality and depth of contribution, methodological soundness, form and quality of the presentation, and significance for the research field of BPM. For details of my thesis, please see the "Dissertations" section in this CV.

QUT Outstanding Doctoral Thesis Award (ODTA)

QUT Apr 2024
Awarded for my doctoral thesis completed in 2023. ODTA is a highly competitive award, which rewards the top doctoral theses (5%) annually for outstanding contribution to knowledge and demonstrating excellence in postgraduate research.

Australian Commonwealth Research Training Program Stipend

QUT 2019–2023
Prestigious research scholarship awarded for funding full-time PhD research in Australia.

Food Agility Excellence Award: Graduate of Merit

Food Agility CRC Nov 2023
Awarded for my contributions in project Predicting Green Bean Harvest and Yield (FA048). This award was announced at the 2023 Digital Agrifood Summit in Australia and featured in a Food Agility news article.

Engagement Award

School of Information Systems, QUT Nov 2023
Awarded in recognition of my engagement with partners in industry projects.

PhD Top-Up Scholarship

Food Agility CRC 2021–2022
Awarded for funding my work in the project Green Bean Harvest and Yield (FA048)

Australian Mathematical Sciences Institute (AMSI) Winter School Scholarship

QUT 2021
Awarded for funding my participation in the Winter School in July 2021.

HDR Internship Scholarship

QUT 2021
Awarded for funding two-month full-time internship at Dnata Catering Australia.

Excellent Master Student Award

Sun Yat-sen University 2018
Awarded in recognition of academic performance.

First-class Scholarship for Master Student

Sun Yat-sen University 2016
Awarded for funding my Master by Research studies.

Meritorious Winner

The Mathematical Contest in Modeling (MCM) 2015
Awarded for team achievement in solving 2015 MCM Problem A: Eradicating Ebola.

Dissertations

Doctoral thesis

Title: Discovering Organizational Models from Event Logs for Workforce Analytics

Supervisors: A/Prof. Chun Ouyang, Prof. Arthur ter Hofstede, Prof.dr.ir. Wil van der Aalst

Description: This research investigates knowledge discovery from business process execution data to support workforce analytics and improve business process management. It proposes a novel framework “OrdinoR” for mining organizational models from process execution data stored in event logs. Underpinned by “OrdinoR”, a set of novel data-driven methods are developed to systematically construct, evaluate, and analyze organizational models, which can be utilized for guiding organizational structure design and staff deployment toward process improvement. The usefulness of the proposed methods was evaluated through experiments using public datasets from five real-world organizations across three business domains. Outcomes from this research have appeared in several top-tier journal and conference publications [2, 1, 4, 6, 5]. This thesis was rewarded with (1) the QUT Outstanding Doctoral Thesis Award for 2023 and (2) the Best Dissertation Award at the BPM Conference 2024.

Keywords: process mining, event log, organizational model, workforce analytics, organizational model discovery, conformance checking, business process management

Master thesis

Title: An Organizational Mining Method for Supporting Business Process Redesign

Supervisor: Prof. Yang Yu

Description: This research aims at applying organizational mining from event logs to support the utilization of generalist resources as one of the best practices for business process redesign. Specifically, a novel technique is developed to discover organizational models with overlaps across groups, which can be used by process practitioners in identification of generalist resources. The effectiveness of the proposed technique was evaluated on real-life event datasets. Outcomes from this research were reported in a BPM conference paper [7].

Keywords: organizational mining, organizational model mining, business process redesign, cluster analysis, business process management

Experience

Research

Postdoctoral Research Fellow

Brisbane

School of Information Systems, QUT

2023 – Now

- I am a researcher in the project “Foragecaster”, where I collaborate with multiple researchers and practitioners to develop a planner system powered by accurate and reliable machine learning models, designed to support critical decisions in livestock farming. For more details on my roles and contributions, please refer to the Industry section below.
- I continue my research on process mining with a focus on the resource/organizational perspective. Specifically, I am interested in developing methods to utilize resource-oriented and process-oriented models discovered from event logs in synergy for informing process improvement.
- I also grow my interest in developing systematic approaches that combine formal model-driven and data-driven techniques to address data quality issues in complex software systems, in particular those developed with AI capabilities for predictive purposes.
- I act as an associate supervisor for a current PhD student in the School of Information Systems who researches on the conceptualization of Robotics Process Automation.

Learning and Teaching

Lecturer

Brisbane & Nanjing

Jinling Institute of Technology (JIT)-QUT Joint Program

2023

I developed teaching materials and delivered lectures for an undergraduate unit *Business Process Modelling* at JIT. I also coordinated tutorials, exam, and assignment marking for the unit.

Academic Tutor

Brisbane

QUT

2020–2021

- I was a tutor for a postgraduate unit *Rapid Web Development (IFN557)*, where I led the tutorials and marked student assignments (a website development project).
- I was also a tutor for a postgraduate unit *Advanced Project for Master of Data Analytics (IFN703/IFN704)*, where I participated in the panel reviewing student presentations of their data science research projects and graded their final project reports.

Teaching Assistant (Tutor)

Guangzhou

Sun Yat-sen University

2015–2018

I was a teaching assistant for several undergraduate units, *Programming in High-Level Language using C++*, *System Analysis and Design using UML*, and *Workflow Technology*. In my role, I helped the unit coordinators with the design of assessments and student Q&A on tutorials. I also graded student assessments, including project reports and exam papers.

Industry

Postdoctoral Research Fellow

Brisbane

Project: *Foragecaster*

Apr 2023 – Now

This project aims to develop an AI-supported grazing planner for livestock farming. The planner will support producers in making decisions across various scenarios, considering weather forecasts, pasture and livestock growth, and farm sustainability. I collaborate with researchers and practitioners from various fields and contribute my research capabilities across multiple streams.

- Data quality and explainability: My role is to develop systematic approaches in the context of livestock farming to evaluate the quality of key production data, diagnose and mitigate data quality issues, and investigate potential root causes. These approaches will be underpinned by techniques in data modeling, data visualization, and statistical analysis.
- System architecture: My role in this stream is to design software architecture for the Foragecaster system. I apply my skills in system analysis and modeling to develop architecture that will enable synergistic interface between a range of AI-embedded models in software deployment.
- Sustainability: My role was to conduct pilot research on the topic of farm sustainability and natural capital assessment. I performed a structured survey of current frameworks and metrics for assessing farm sustainability. With biodiversity identified as the key theme in sustainability, I curated and evaluated an array of public environmental datasets in Australia (including for example, Atlas of Living, native vegetation information, protected areas database) regarding their use for farm sustainability reporting. Outcomes from the survey and evaluation will enable benchmark of farm sustainability and recommendations for long-term actions.

Research Student and Software Developer

Brisbane

Project: *Predicting Green Bean Harvest and Yield*

2020–2023

This project aimed to develop a computational model to predict the maturity of sequentially planted green bean crops using historical crop development and yield records. I participated in this Food Agility project (FA048) as a PhD student, funded by a top-up scholarship awarded jointly by Food Agility CRC and the industry partner.

- I researched the application of process modeling and Predictive Process Analytics (PPA) in the field of precision agriculture, focusing specifically in the design of a PPA-based method for the forecast of green bean harvest timing and yield. The outcome of this research led to a peer-reviewed academic publication [3] reporting our method and its evaluation using the industry data.
- I designed and co-developed a web application as a minimum viable product (“Grena-Bena”) that integrates a predictive model and a production planning algorithm. The predictive model factors in planting date, crop variety, location, and weather information to generate yield forecasts for green beans. These forecasts are then utilized by the planning algorithm that creates optimal production plans to align with sales plan set by users. Grena-Bena streamlined the assessment of the computation models by agronomists in a user-friendly way and supported iterative refinement of model performance.

Workforce Planning Analyst (Internship)

Brisbane

Dnata Catering Australia

2021

This project was conducted during my PhD and was an eight-week internship in partner with Dnata Catering Australia. The project aim was the development of a mathematical model to plan for future labor requirements, considering historical rosters, employment entitlements, work rules, and workload, and support decisions on rebuilding the workforce post-pandemic.

- I collected and analyzed a collection of workforce data in the organization. As an outcome, I proposed a conceptual data model that enabled effective communication with industry experts regarding data availability and data requirements.
- I formulated the core problem by identifying key research tasks and devised a systematic solution incorporating a labor demand prediction model, an employee work profiles model, and an discrete optimization model to calculate labor resource requirements under various scenarios and constraints.
- I developed an easy-to-use, MS Excel tool as a software prototype to implement the proposed solution and evaluated the tool with project partner.

Academic Service

Reviewer for academic conference papers

BPM 2022, ECIS 2023, ICPM 2023, BPM 2024, ICPM 2024, ACIS 2024

2022-2024

Publications

Journal Articles

- [1] J. Yang, C. Ouyang, W. M. P. van der Aalst, A. H. M. ter Hofstede, and Y. Yu, “OrdinoR: A framework for discovering, evaluating, and analyzing organizational models using event logs,” *Decis. Support Syst.*, vol. 158, p. 113771, 2022. DOI: 10.1016/J.DSS.2022.113771.

Conference Articles

- [2] J. Yang, C. Ouyang, and A. H. M. ter Hofstede, “Learning execution contexts from event logs,” in *Proceedings of the 2nd International Workshop on Process Management in the AI Era (PMAI 2023) co-located with 31st International Joint Conference on Artificial Intelligence (IJCAI 2023)*, Macao, S.A.R, August 19, 2023, vol. 3569, CEUR-WS.org, 2023, pp. 33–36.
- [3] J. Yang, C. Ouyang, G. Dik, P. Corry, and A. H. M. ter Hofstede, “Crop harvest forecast via agronomy-informed process modelling and predictive monitoring,” in *Advanced Information Systems Engineering - 34th International Conference, CAiSE 2022, Leuven, Belgium, June 6-10, 2022, Proceedings*, vol. 13295, Springer, 2022, pp. 201–217. DOI: 10.1007/978-3-031-07472-1_12.

- [4] **J. Yang**, C. Ouyang, A. H. M. ter Hofstede, and W. M. P. van der Aalst, "No time to dice: Learning execution contexts from event logs for resource-oriented process mining," in *Business Process Management - 20th International Conference, BPM 2022, Münster, Germany, September 11-16, 2022, Proceedings*, vol. 13420, Springer, 2022, pp. 163–180. DOI: 10.1007/978-3-031-16103-2_13.
- [5] **J. Yang**, "Discovering organizational knowledge via process mining," in *Proceedings of the Doctoral Consortium Papers Presented at the 33rd International Conference on Advanced Information Systems Engineering (CAiSE 2021), Melbourne, Australia, June 28 - July 2, 2021*, vol. 2906, CEUR-WS.org, 2021, pp. 41–48.
- [6] **J. Yang**, C. Ouyang, A. H. M. ter Hofstede, W. M. P. van der Aalst, and M. Leyer, "Seeing the forest for the trees: Group-oriented workforce analytics," in *Business Process Management - 19th International Conference, BPM 2021, Rome, Italy, September 06-10, 2021, Proceedings*, vol. 12875, Springer, 2021, pp. 345–362. DOI: 10.1007/978-3-030-85469-0_22.
- [7] **J. Yang**, C. Ouyang, M. Pan, Y. Yu, and A. H. M. ter Hofstede, "Finding the "liberos": Discover organizational models with overlaps," in *Business Process Management - 16th International Conference, BPM 2018, Sydney, NSW, Australia, September 9-14, 2018, Proceedings*, vol. 11080, Springer, 2018, pp. 339–355. DOI: 10.1007/978-3-319-98648-7_20.
- [8] W. Chen, **J. Yang**, and Y. Yu, "Analysis on communication cost and team performance in team formation problem," in *Collaborative Computing: Networking, Applications and Worksharing - 13th International Conference, CollaborateCom 2017, Edinburgh, UK, December 11-13, 2017, Proceedings*, vol. 252, Springer, 2017, pp. 435–443. DOI: 10.1007/978-3-030-00916-8_41.
- [9] Y. Yu, W. Chen, and **J. Yang**, "Team formation in business process context," in *21st IEEE International Conference on Computer Supported Cooperative Work in Design, CSCWD 2017, Wellington, New Zealand, April 26-28, 2017*, IEEE, 2017, pp. 73–78. DOI: 10.1109/CSCWD.2017.8066673.