Research Statement

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Background

My research focuses on applying Operational Research (OR) to complex resource planning, scheduling, and coordination problems in logistics and transportation. Recently, I have expanded my interests to related areas such as applying machine learning (ML) to logistics. My research vision is to combine theory and experimentation to develop novel algorithms, mechanisms, and frameworks that support decision-making processes in these domains and create meaningful impact for both theoreticians and practitioners. I am also motivated by tackling new and challenging problems, working with interesting data sources, and fostering interdisciplinary collaborations.

My research interests are broadly classified in two broad areas which are in line with one of SMU research areas “Sustainability Living”, two of SCIS core research areas “Decision Making and Optimisation” & “Machine Learning and Intelligence”, and one of integrative research areas “Urban Logistics and Sustainability”:

1. Logistics and transportation: *vehicle routing problem, warehouse management, orienteering problem, green logistics, waste and e-waste management, and other related topics;*
2. Optimisation and analytics in various domains

Logistics and transportation. Logistics involves the science of planning, managing, and implementing procedures for the most efficient and effective storage and transportation of goods and services. Although logistics and transportation are sometimes used interchangeably, they differ in scope: logistics encompasses the integration of storage, transportation, cataloging, handling, and packaging of goods, whereas transportation refers specifically to the movement of products from one location to another.

I specialize in route planning problems, particularly the Vehicle Routing Problem (VRP) and the Orienteering Problem (OP). My research interests have also expanded to other types of transportation problems, such as vehicle routing with cross-docking and reverse cross-docking, multi-vehicle cycle inventory routing, and vehicle routing with green logistics considerations—including waste and e-waste management.

Recently, I have been working on research related to applying machine learning techniques in logistics, transportation, and warehouse management. My current focus is on implementing machine learning approaches to solve stochastic and dynamic logistics problems.

Optimization and analytics in business. I have worked on some projects related to optimization and analytics in various domains, especially related to education, manpower scheduling, healthcare and airline industries.

Research Areas

1. Logistics and Transportations

Vehicle Routing Problem. In last few years, my research publications are mainly supported by three research grants:

- MOST Add-on Grant for International Cooperation (MAGIC) MOST106-2410-H-011-002-MY3 (Project Title: Optimization Models for City Logistics with Electric Vehicles) (Years 2020-2021)
- SMU Internal Research Grant Academic Research Fund (AcRF) Tier 1 (Project Title: Vehicle Routing Problem with a Reverse Cross-Dock) (Years 2020-2021)
- SMU Internal Research Grant Academic Research Fund (AcRF) Tier 1 (Project Title: "E-waste must never be waste": Vehicle Route Planning Optimization) (Years 2022-2023)

MOST Add-on Grant for International Cooperation (MAGIC): For this grant, I have been appointed as the PI (Singapore based) to collaborate with Prof. Vincent F. Yu from NTUST (Taiwan). This grant focuses on developing optimization models in city logistics, which is an add-on to his grant MOST106-2410-H-011-002-MY3 (Project Title: Optimization Models for City Logistics: 2017-2021), awarded by Ministry of Science and Technology (MOST) Taiwan.

I worked on the problem of designing a two-echelon freight distribution system in a dense urban area that considers third-party logistics (TPL) and loading–unloading zones (LUZs) [Yu et al., 2018, 2020]. Collaborating with a third party logistic (TPL) is one of the business strategies to increase the competitiveness of a company. The proposed system takes advantage of outsourcing the last mile deliveries to a TPL provider and utilizing LUZs as temporary intermediate facilities instead of using permanent intermediate facilities to consolidate freight. Main contributions include a new mathematical model and a Simulated Annealing (SA) algorithm to solve a two-echelon freight distribution system in Taipei City, Taiwan as a case study.

I also focused on a new variant of the vehicle routing problem, namely the Green Mixed Fleet Vehicle Routing Problem with Realistic Energy Consumption and Partial Recharges [Jodiawan et al., 2019a, Yu et al., 2021b]. This problem contains three important characteristics — realistic energy consumption, partial recharging policy, and carbon emissions. The main contribution includes the analysis of the potential carbon emission reduction resulting from the proposed model.

SMU Internal Research Grant Academic Research Fund (AcRF) Tier 1 (VRP-RCD): This project studies a four-level supply chain network: an integration of suppliers, cross-dock, customers, and outlets, with the objective of minimizing the vehicle operational and transportation costs. Cross-docking consists of transferring incoming deliveries directly to outgoing vehicles without storing or keeping them in between [Yan and Tang, 2009] to cut the inventory costs while increasing the flow of goods or items and shortening the shipping cycle.

This research work was first started by focusing on the VRP with cross-docking (**VRPCD**) (Figure 1a). The contribution is to develop algorithms (heuristics) that can be further applied to extended problems, namely the VRP with reverse cross-docking (VRP-RCD) and the VRP with forward-reverse cross-docking (VRP-FRCD). Reverse logistics is defined as the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose

of recapturing value or proper disposal [Roger and Tibben-Lembke, 1999]. Returns process management, which is a part of reverse logistics, has become an interesting field of performance improvement, especially true in business with seasonal demand, such as fashion or books. Motivated by the ability of a VRPCD network to minimize the distribution cost in the forward flow, my work incorporates the reverse logistics scheme in a VRPCD network, namely the VRP with reverse cross-docking (VRP-RCD), as illustrated in Figure 1b. I also worked on the integration of both forward and reverse flows in a cross-docking network, namely the vehicle routing with forward and reverse cross-docking, VRP-FRCD, namely the VRP with forward and reverse cross-docking (VRP-FRCD).

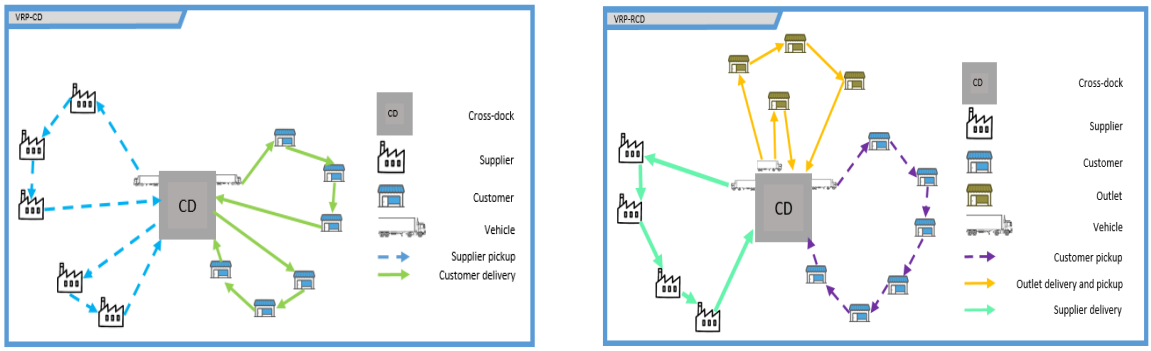

Figure 1. (a) The VRPCD model, (b) The VRP-RCD model

The AcRF Tier 1's contributions are summarized in Table 1. In total, I have published 5 conference papers (full papers) and 1 conference paper (short paper). Two journal papers have also been published in Year 2021. Our main contributions include new mathematical models, newly generated benchmark problems which are inspired by real-life problems that can be used and solved by other researchers and most of our results are considered as the best-known solutions so far.

Table 1. Research publications of AcRF Tier 1

Problems	Contributions	Publications
VRPCD	A new mathematical model for handling and delivering multiple products and two sets of benchmark instances inspired by real-world scenarios	[Gunawan et al., 2020d]
	A metaheuristic algorithm, Adaptive Local Neighborhood Seach, solves larger instances which commercial software is unable to do so	[Gunawan et al., 2020b]
	The proposed algorithm, a two-phase matheuristic, improves 80 (out of 90) best known solutions of benchmark instances; therefore, they are treated as the latest best-known solutions	[Gunawan et al., 2020c, 2021b]
VRP-RCD	A new mathematical model and newly generated benchmark instances for a four-level supply chain network that involves suppliers, cross-dock, customers, and outlets in the context of VRP-RCD	[Widjaja et al., 2020b]
	The proposed algorithm, a two-phase heuristic, provides new best-known solutions for newly generated benchmark instances	[Gunawan et al., 2020a]
	The proposed algorithm, a two-phase matheuristic, further improves my previous work; therefore, they are treated as the latest best-known solutions	[Gunawan et al., 2021a]
VRP-FRCD	A new mathematical model and newly generated benchmark instances for a four-level supply chain network that involves suppliers, cross-dock, customers, and outlets in the context of VRP-FRCD	[Gunawan et al., 2021e]
	The proposed algorithm, a two-phase matheuristic, provides the latest best-known solutions	
	A new mathematical model and newly generated benchmark instances by considering heterogeneous fleet vehicle routing problem with multiple forward-reverse cross-docks	[Anh et al., 2022]

***SMU Internal Research Grant Academic Research Fund (AcRF) Tier 1 (E-waste)*:** In this project, together with Assistant Prof Aidan Wong (CIS-SMU) as co-PI, we study the e-waste collection problem, using a case study in the Singapore context, and formally model it as the dynamic VRP considering multi-compartment fleet. We also consider the joint optimization problem of e-waste collection problem performed by multiple PRS Operators as another extension which is not implemented yet in Singapore. The contributions include the proposed method, the deep reinforcement learning, to recommend an optimal e-waste collection schedule that deals with real-world constraints such as the dynamic nature of the e-waste amount and e-waste truck limitations. Prior to this grant, I have published a survey paper related to the waste collection routing problem (WCRP) [Liang et al., 2022]. The paper reviews the latest approaches and applications on the collection and routing of waste.

I focus on the application of Machine Learning in logistics in this grant. To be specific, I have applied some ML techniques in the e-waste collection problem [Nguyen et al., 2024, 2025]. Electrical and Electronic Equipment (EEE) has evolved into a gateway for accessing technological innovations. The rapid turnover of EEE imposes substantial pressure on the environment due to the shortened life cycles. E-waste encompasses discarded EEE and its components which are no longer in use. The study focuses on the e-waste collection problem and models it as a Vehicle Routing Problem with a heterogeneous fleet and a multi-period planning problem with time windows as well as stochastic travel times. Two different Q-learning-based methods are designed to enhance the search procedure for finding solutions of the problem. The first method involves utilizing the state-action value (Qvalue) to determine the order of multiple improvement operators within the GRASP framework. The second method involves a hyperheuristic that extracts a stochastic policy from the Q-table to select heuristic operators during the search.

Another study models the e-waste collection process as a stochastic Vehicle Routing Problem (VRP), specifically the Heterogeneous VRP with Multiple Time Windows and Stochastic Travel Times (HVRP-MTWSTT). This problem involves the multi-period route planning of a heterogeneous fleet with stochastic traveling times. We propose a solution method that employs Deep Reinforcement Learning to steer local search heuristics (DRL-LSH). Computational experiments demonstrate that DRL-LSH performs competitively with the investigated hyperheuristic and metaheuristic methods on the small-sized instances, while the DRL-LSH widens the performance gap as the size of the problem instances increases. The integration of DRL into the search procedure enhances efficiency and robustness, and also provides a certain level of explainability. It shows that utilizing DRL to control heuristics is particularly well-suited for solving real-world VRPs that are large, complex, and subject to stochastic variations [Nguyen et al., 2025]. The outcomes of this grant are listed in Table 2.

Table 2. Research publications of AcRF Tier 1

Problems	Contributions	Publications
Extended Producer Responsibility (EPR)	This work examines the role of the Extended Producer Responsibility (EPR) scheme in managing electronic waste (e-waste) logistics in Singapore.	[Gunawan et al., 2023a, 2025]
Static e-waste model	This study proposes a mixed integer linear programming (MILP) model to solve the e-waste collecting problem by formulating it as the heterogeneous vehicle routing problem with multiple time windows (HVRPMTW). The model is validated with newly developed benchmark instances that are solved by commercial software, CPLEX. The model is also adopted for solving a real case study in the context of Singapore.	[Gunawan et al., 2023c]
	This study proposes a metaheuristic based on the Greedy Randomized Adaptive Search Procedure complemented by Path Relinking (GRASPPR) to solve the e-waste problem.	[Gunawan et al., 2023b, 2023d]
Dynamic e-waste model	We introduce two methods for integrating and utilizing Q-learning to generate a trained Q-table into the search procedure to solve the Heterogeneous VRP with Multiple Time Windows and Stochastic Travel Time problem.	[Nguyen et al., 2024]
	In this study, we model the e-waste collection process as a stochastic Vehicle Routing Problem (VRP), specifically the Heterogeneous VRP with Multiple Time Windows and Stochastic Travel Times (HVRP-MTWSTT). This problem involves the multi-period route planning of a heterogeneous fleet with stochastic traveling times. We propose a solution method that employs Deep Reinforcement Learning to steer local search heuristics (DRL-LSH).	[Nguyen et al., 2005]

Other transportation and logistics publications. The Vehicle Routing Problem (VRP) was formally presented to scientific literature since 1959 [Dantzig and Ramser, 1959]. I have published a survey of VRP datasets, categorized to enable researchers to have easy access to the problem(s) that are of interest [Gunawan et al., 2021c]. Various datasets have been proposed to enable researchers to compare their algorithms using the same problem instances where either the best-known solution is known, or the optimal solution is known. I also make some suggestions as to the type of datasets that might be useful in the future to provide the scientific community with even more challenging problems, which are suited to the problems that we face today.

[Wang et al., 2025] investigates the storage location optimization in an automated storage and retrieval system (AS/RS). An optimization approach based on the Deep Q-Network (DQN) algorithm is introduced to enhance warehouse task efficiency and minimize stacker travel during storage and retrieval. To accelerate the algorithm training process, we integrate a prioritized experience replay mechanism. Furthermore, we decouple action selection from value estimation within the DQN framework to address the issue of value overestimation. The proposed model is evaluated against three heuristic methods. The experimental results demonstrate that our approach significantly outperforms these baselines.

[Vincent et al., 2025] and [Gunawan et al., 2025b] focus on the application of the VRP in the healthcare domain. [Vincent et al., 2025] introduces a blood distribution system under vendor-managed inventory that considers uncertain supply and demand. We present it as the Blood Stochastic Inventory Routing Problem, formulating it as a two-stage stochastic programming model. To solve this problem, this study proposes a three-stage matheuristic that combines a perturbation heuristic, Adaptive Large Neighborhood Search, and an exact approach. [Gunawan et al., 2025b] extend the Selective Vehicle Routing Problem with Integrated Tours problem (SVRPwIT) by considering: (i) multiple shuttles, (ii) multiple blood types, (iii) multiple trips for the bloodmobiles, and (iv) the visiting availability of the donation sites. The proposed adaptive large neighborhood search (ALNS) algorithm, with a simulated

annealing (SA) acceptance criterion, is tested on generated instances adopted from a real-life case of the Surabaya Red Cross. SVRP-BM provides a strategic solution to Surabaya's blood shortage by optimizing blood collection. Other transportation and logistics publications which focus on new variants or problems are listed in Table 3.

Table 3. Other transportation and logistics publications

Domains	Problems	Publications
VRP	VRP with simultaneous pickup and delivery with an occasional driver	[Yu et al., 2021d]
	Time-Dependent VRP with Time Windows	[Liang et al., 2019]
	The integration of assignment and routing with mixed service mode cross-dock	[Gunawan et al.,2019c]
	Multi-Vehicle Cyclic Inventory Routing Problem	[Gunawan et al., 2019a, 2019d; Yu et al., 2021c]
	VRP with simultaneous pickup and delivery and occasional drivers	[Yu et al., 2023]
	Heterogeneous Fleet VRP with multiple forward/reverse cross-docks	[Yu et al., 2024b]
	VRP with parcel locker and public transportation	[Nguyen et al., 2023a, 2023b]
	An Adaptive Large Neighborhood Search for the Multi-Vehicle Profitable Tour Problem with Flexible Compartments and Mandatory Customers	[Yu et al., 2024c]
	Application of an Improved Harmony Search Algorithm on Electric Vehicle Routing Problems	[Minanda et al., 2024]
Two-echelon delivery system	Crowdsourcing transportation system into the two-echelon delivery system	[Putra et al., 2020]
	Two-echelon vehicle routing problem with time windows, covering options, and occasional drivers	[Yu et al., 2021a]
Last-mile delivery	Parcel locker sharing problem	[Indrakarna et al., 2019; Rasyid et al., 2020]
Healthcare scheduling problem	A Three-Stage Matheuristic for the Blood Stochastic Inventory routing problem	[Yu et al., 2025]
	A selective VRP for the bloodmobile system	[Gunawan et al., 2025b]
Automated storage and retrieval systems	An Automated Storage and Retrieval System in a warehouse distribution	[Wang et al., 2025]

Orienteering Problem. I have been working on the route planning problems in which the selection of customers is integrated, namely the Orienteering Problem (OP). This work was started in my early years as a faculty member, and it nicely follows from my previous work as a research scientist. This problem is originally from the sport game of orienteering [Vansteeenwegen et al., 2011]. The goal is to find a single route by visiting as many nodes as possible that maximizes the total collected score subject to a given time budget frame and fixed start and end nodes. I have published a comprehensive survey of the OP [Gunawan et al., 2016b], that has received 491 citations by 29 July 2022. Prior to 2020, I have also been working on three different classifications of the OP: the classical OP, extended variants of the OP and applications of the OP as summarized in Table 4.

Table 4. The Orienteering Problem Publications (prior 2020)

Classifications	Problems	Publications
Classical Variants	Team OP with Time Windows	[Gunawan et al., 2017a, 2017c, 2018a]
	Time Dependent OP	[Gunawan et al., 2014, 2016f, 2018a]
Extended Variants	Team OP with Variable Profits	[Gunawan et al., 2016b, 2018b]
	Capacitated Team OP	[Gunawan et al., 2018d, 2019e]
	Team OP with Time Windows and Partial Scores	[Yu et al., 2019]
Application	Crowdsourcing	[Chen et al., 2014]
	Tourist Trip Design Problem	[Gunawan et al., 2016g, Liang et al., 2017, 2023e]
	Healthcare Problem	[Gunawan et al., 2017b]
	Personalized Conference Recommendation	[Gunawan et al., 2016c, 2016e]

I have also published a textbook with the title of "Orienteering Problem: Models and Algorithms for Vehicle Routing Problems with Profits" [Vansteenwegen and Gunawan, 2019]. This tutorial book covers a comprehensive review of variants of the OP, mathematical models and techniques for solving these OP variants and discusses their complexity. It also reviews the latest applications of these problems in the fields of logistics, tourism, and others. The book mainly aims for graduate students in engineering, economics, applied mathematics and operations research. Practitioners and planning engineers in logistic companies will be inspired by this book. In the last five years, together with co-authors, my main contributions focus on the extended variants of the OP and applications of the OP in real-world problems, as summarized in Table 5.

Table 5. The Orienteering Problem Publications

Problems	Applications	Contributions	Publications
OP with Time Windows	Agile Earth Observation Satellite	The proposed algorithm, Adaptive-directional Dynamic Programming with Decremental State Space Relaxation, outperforms the SOTA algorithms in solving benchmark instances	[Peng et al., 2019, Peng et al., 2020]
Team OP	Unmanned Surface Vehicle problem	The proposed algorithm, the Iterative Clustering Heuristic, solves a real-world scenario effectively	[Prasetia et al., 2020]
Set OP with Time Windows	Consolidated delivery in supply chain	The proposed algorithm, Adaptive Large Neighborhood Search, is comparable to the SOTA algorithms in solving benchmark instances	[Gunawan et al., 2021d]
Capacitated Team OP	The vehicle routing problem with limited resource capacities	The proposed algorithm, Simulated Annealing and Iterated Local Search, is comparable to the SOTA algorithms in solving benchmark instances	[Zhu et al., 2021]
Time Dependent OPTW and Service Time Dependent Profits	The vehicle routing problem with variable service times and profits of nodes	The proposed algorithm, Variable Neighborhood Search, solves a real-world problem for the city of Shiraz (Iran)	[Khodadadian et al., 2022]
Team OP	Machine Learning in Algorithm Selection	The proposed algorithm selection, ALORS, outperforms the SOTA algorithms in solving benchmark instances	[Misir et al., 2022]
Set TOPTW	The vehicle routing problem with profits	The proposed algorithm, Simulated Annealing with Reinforcement Learning, outperforms the SOTA algorithms in solving benchmark instances	[Yu et al., 2024]

In 2023, one publication [Yu et al., 2024a] investigates the Set Team Orienteering Problem with Time Windows (STOPTW), a new variant of the well-known Team Orienteering Problem with Time Windows and Set Orienteering Problem. In STOPTW, customers are grouped into clusters. Each cluster is associated with a profit attainable when a customer in the cluster is visited within the customer's time window. A Simulated Annealing with Reinforcement Learning algorithm is developed to solve large STOPTW benchmark instances. I am currently writing a book chapter for the application of the OP in logistics. This chapter covers the most recent variants, methods, and applications of the OP. The book will be released in 2026. Other publications of the OP and its variants are listed in the following table.

Problems	Applications	Contributions	Publications
OP with Time Windows	Agile Earth Observation Satellite	The proposed algorithm, Adaptive-directional Dynamic Programming with Decremental State Space Relaxation, outperforms the SOTA algorithms in solving benchmark instances	[Peng et al., 2019, Peng et al., 2020]
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Set OP with Time Windows	Consolidated delivery in supply chain	The proposed algorithm, Adaptive Large Neighborhood Search, is comparable to the SOTA algorithms in solving benchmark instances	[Gunawan et al., 2021d]

Itinerary recommendation is a complex sequence prediction task made harder by the need to balance factors such as queue times, crowd levels, attraction popularity, walking distance, and operating hours. These challenges are amplified by dynamic visitor flows and collective user behavior, which many existing single-user approaches overlook. Inspired by issues like the Selfish Routing problem, [Liu et al., 2025] introduce SCAIR, a Strategic and Crowd-Aware Itinerary Recommendation algorithm that incorporates real-world crowd behavior to optimize group utility. SCAIR formulates the task as an MDP and uses a novel State Encoding mechanism for efficient, real-time planning in linear time. By prioritizing group outcomes over individual gains, it mitigates the downsides of selfish routing. Evaluations on a large real-world theme park dataset show that SCAIR consistently outperforms competitive baselines, improving group utility across four major theme parks.

Agile Earth Observation Satellite scheduling involves selecting and sequencing target observations—each with a profit and multiple time windows—to maximize total profit under operational constraints. This problem extends the Team Orienteering Problem with Time Windows (TOPTW) by adding time-dependent transition times between observations and variable time windows across different satellite orbits, forming the Time-dependent TOP with Variable Time Windows. [Peng et al., 2025a] propose an efficient branch-and-cut-and-price (BCP) algorithm that leverages these problem characteristics, incorporating enhancements such as a Lagrangian bound, ng-path relaxation, a primal heuristic, and subset-row inequalities. Experiments across diverse benchmark configurations show the BCP algorithm's superior performance, with the primal heuristic producing strong lower bounds and outperforming existing heuristics. Applied to the classical TOPTW, the framework also significantly outpaces state-of-the-art exact methods.

Unmanned aerial vehicles (UAVs) play a key role in reconnaissance missions, making efficient multi-UAV mission planning essential. Existing methods for the multi-UAV reconnaissance mission planning problem (MURMPP) often face heavy computational demands and yield suboptimal results. To address this, [Fan et al., 2025] propose a divide-and-conquer framework that separates the task into target

allocation and UAV routing, reducing complexity. Their hybrid SA-NNO-DRL method combines nearest-neighbor-optima deep reinforcement learning (NNO-DRL) for route construction with simulated annealing (SA) for reallocating uncovered targets. The two phases iterate until termination. Experiments show that this approach outperforms exact solvers, heuristics, and learning-based methods, delivering the most best-quality solutions in 8 of 12 instance groups within 0.5 seconds, particularly excelling in larger and more variable problem settings.

Recent advances in machine learning have spurred interest in solving combinatorial optimization problems (COPs) with data-driven methods. Building on this trend, [Peng et al., 2025b] introduce a learning-augmented exact algorithm for the NP-hard Orienteering Problem with Time Windows, which seeks to maximize the score collected by visiting selected vertices within their time windows. Traditional exact methods depend heavily on domain-specific design, limiting further gains. Their approach uses deep learning to learn effective relaxations that enhance a dynamic programming algorithm. A new graph convolutional network predicts the directed edges that define these relaxations, trained in a supervised manner using optimal solutions as labels. Experiments show that the method surpasses the best existing exact algorithm, achieving a 38% speedup on Solomon's benchmark and over a sevenfold improvement on the more difficult Cordeau benchmark.

2. Optimization and Analytics in Various Domains

The transition from pre-tertiary to higher education is crucial. [Gunawan et al., 2025c] survey students to examine how resilience relates to academic performance, learning experiences, and well-being, supporting efforts to improve student engagement and readiness for a competitive job market. The study finds that (i) highly resilient students report greater life satisfaction and stronger academic performance, (ii) a supportive learning environment enhances study outcomes, and (iii) academic program experiences help build resilience. A grade prediction model using past performance, resilience levels, learning experiences, and well-being can reliably forecast students' overall academic results, with an average error of about one letter grade.

[Gunawan et al., 2025a] examines how Singapore's Extended Producer Responsibility (EPR) scheme influences electronic waste management, focusing on policy drivers, challenges, and youth attitudes using an online survey. Using the Theory of Reasoned Action and the Theory of Planned Behavior, the study models how attitudes, norms, awareness, and perceived convenience shape EPR perceptions. Findings underscore the need for tailored policies and greater awareness of formal recycling channels. The study also tests associations between factors such as disposal distance, recycling motivations, and EPR-related attitudes, and analyzes consumption patterns, cost-allocation preferences, and the role of incentives and penalties. Finally, text analysis highlights concerns and recommendations from respondent groups for improving the EPR scheme.

Selected Publications and Outputs

[Anh, et al., 2022] P. Anh, V.F. Yu, **A. Gunawan**, H. Han, "Integrating Forward and Reverse Logistics in Vehicle Routing Problem with Cross-docking", proceedings of the 16th International Congress on Logistics and SCM Systems (ICLS 2022), August 28-30, 2022, Khon Kaen, Thailand - abstract

[Chen et al., 2014] C. Chen, S.-F Cheng, **A. Gunawan**, A. Misra, D. Chander and K. Dasgupta, "TRACCS: Trajectory-Aware Coordinated Urban Crowd-Sourcing", proceedings of the 2nd AAAI Conference on Human Computation and Crowdsourcing (HCOMP-2014), 2-4 November 2014, Pittsburgh, USA

[Dantzig and Ramser, 1959] Dantzig, G. and Ramser, J. (1959), “The Truck Dispatching Problem”, Management Science, vol. 6, pp. 80-91

[Fan et al., 2025] M. Fan, H. Liu, G. Wu, **A. Gunawan**, and G. Sartoretti, "Multi-UAV Reconnaissance Mission Planning via Deep Reinforcement Learning with Simulated Annealing", Swarm and Evolutionary Computation, vol. 93, pp. 101858, 2025

[Gunawan and Lau, 2013] **A. Gunawan** and H.C. Lau, "Master physician scheduling problem", Journal of the Operational Research Society, vol. 64, pp. 410 - 425, 2013

[Gunawan et al., 2014] **A. Gunawan**, Z. Yuan, and H.C. Lau, "A Mathematical Model and Metaheuristics for Time Dependent Orienteering Problem", proceedings of the 10th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2014), 26-29 August 2014, York, United Kingdom

[Gunawan et al., 2016a] **A. Gunawan**, H.C. Lau and P. Vansteenwegen, "Orienteering problem: a survey of recent variants, solution approaches and applications", European Journal of Operational Research, vol. 255, pp. 315 - 332, 2016

[Gunawan et al., 2016b] **A. Gunawan**, K.M. Ng, G. Kendall and J. Lai, "An ILS Algorithm for the Team Orienteering Problem with Variable Profit", proceedings of the 17th Asia Pacific Industrial Engineering and Management Systems Conference (APIEMS 2016), 7 December - 10 December 2016, Taipei, Taiwan

[Gunawan et al., 2016c] **A. Gunawan**, H.C. Lau, P. Varakantham and W. Wang, "An Intelligent System for Personalized Conference Event Recommendation and Scheduling", proceedings of the 22nd European Conference on Artificial Intelligence (ECAI 2016), 29 August - 2 September 2016, The Hague, Netherlands

[Gunawan et al., 2016d] **A. Gunawan**, H.C. Lau and K. Lu, "A fast algorithm for personalized travel planning recommendation", proceedings of the 11th International Conference on the Practice and Theory of Automated Timetabling, 23 - 26 August 2016, Udine, Italy

[Gunawan et al., 2016e] **A. Gunawan**, H.C. Lau, P. Varakantham and W. Wang, "PRESS: PeRsonalized Event Scheduling recommender System", proceedings of Autonomous Agents and Multiagent Systems International Conference (AAMAS 2016 - DEMOs track), 9 - 13 May 2016, Singapore

[Gunawan et al., 2016f] **A. Gunawan**, H.C. Lau and K. Lu, "Enhancing local search with adaptive operator ordering and its application to the Time Dependent Orienteering Problem", proceedings of the 11th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2016), 23-26 August 2016, Udine, Italy

[Gunawan et al., 2016g] **A. Gunawan**, H.C. Lau and K. Lu, "A fast algorithm for personalized travel planning recommendation", proceedings of the 11th International Conference on the Practice and Theory of Automated Timetabling, 23 - 26 August 2016, Udine, Italy

[Gunawan et al., 2017a] **A. Gunawan**, H.C. Lau, P. Vansteenwegen, and K. Lu, "Well-Tuned Algorithms for the Team Orienteering Problem with Time Windows", Journal of the Operational Research Society, vol. 68 (8), pp. 861 - 876, 2017

[Gunawan et al., 2017b] **A. Gunawan**, H.C. Lau and K. Lu, "Home Health Care Delivery Problem", proceedings of the 8th Multidisciplinary International Scheduling Conference (MISTA 2017), 5 - 8 December 2017, Kuala Lumpur, Malaysia

[Gunawan et al., 2017c] **A. Gunawan**, A.A.N. Perwira Redi, V.F. Yu, P. Jewpanya and H.C. Lau, "A Selective-Discrete Particle Swarm Optimization Algorithm for Solving a Class of Orienteering Problems", proceedings of the 8th Multidisciplinary International Scheduling Conference (MISTA 2017), 5 - 8 December 2017, Kuala Lumpur, Malaysia

[Gunawan et al., 2018a] **A. Gunawan**, H.C. Lau, and K. Lu, "ADOPT: Combining Parameter Tuning and Adaptive Operator Ordering for solving a Class of Orienteering Problems", Computers and Industrial Engineering, vol. 121, pp. 82 - 96, 2018

[Gunawan et al., 2018b] **A. Gunawan**, K.M. Ng, G. Kendall, and J. Lai, "An Iterated Local Search Algorithm for the Team Orienteering Problem with Variable Profits", Engineering Optimization, 2018, vol. 50 (7), pp. 1148 - 1163, 2018

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