

Ayad Turkey

Curriculum Vitae

Education

- 2016–2019 **PhD in Computer Science (Artificial Intelligence and Machine Learning)**, *RMIT University*, Australia.
- 2012–2013 **MSc in Computer Science (Artificial Intelligence)**, *The National University of Malaysia (UKM)*, Malaysia.
- 2002–2006 **BSc in Computer Science**, *University of Al-Anbar*, Iraq.

Experience

Currently, I am working as an Assistant Professor in Computer Science at Department of Computer Science, College of Computing and Informatics, University of Sharjah.

2020-2022, Lecturer in Computer Science at Victoria University.

2019–2020, Research Fellow at RMIT University.

2018 – 2019, Data Analyst, Market Intelligence and Analytics at RMIT University.

2016 – 2018, Research Assistant, at RMIT University.

2012 – 2013, Research Assistant, at Data mining and Optimization Research Group, The National University of Malaysia.

Achievements

- Due to my teaching excellence, I have been awarded the College Teaching Excellence Award 2021 at Victoria University.
- I have been awarded the VU Research Fellowship 2022. This Fellowship provides an award to the academic staff of Victoria University. The key objective of the fellowship is to advance the strategic research priorities of the University. My application was ranked 6 of 28 eligible Early Career Researchers at Victoria University and ranked 1 in the Information Technology Discipline.

Teaching Experience

Over the past seven years, I have worked as a Lecturer, Sessional Lecturer, Head Tutor, Tutor and Lab Demonstrator across different universities: RMIT, Monash, La Trobe, Victoria, UNIANabr.

Lecturer/ Sessional lecturer:

- Data Analytics For Cyber Security (NIT3202).
- Data Science Postgraduate Project (2110).
- Case Studies in Data Science (2050).
- Business Analytics and Data Visualisation (NIT3171).
- Cyber Law Policy and Professional Ethics (NIT2241)
- The Fundamentals of Cyber Security (NIT5081)
- Computer Graphics (CSE4CG).
- Mobile Applications (NIT6120).
- Artificial Intelligence Fundamentals.
- Introduction to Programming (Python).
- Mobile Applications
- Cybersecurity (Enterprise Security Management)
- Data Warehousing and Mining.
- Programming for Engineers and Scientists.
- Artificial Intelligence.
- Advanced Information Systems.
- Algorithms and Analysis (COSC1285).
- Algorithms and Analysis (COSC2123).
- Data Mining.
- Intelligent System.
- Structured Programming using C++.
- Microcomputer Architecture 8086.
- SPSS software.
- Basic Computer Skills.

Head Tutor:

- Practical Data Science.
- Algorithms and Analysis (COSC1285).
- Algorithms and Analysis (COSC2123).

Tutor:

- Data Warehousing and Mining.
- Practical Data Science.
- Secure Electronic Commerce (INTE1070/1071).
- Professional Computing Practice (COSC1147).
- Advanced Professional Development (COSC2615).
- Algorithms and Programming Fundamentals in Python.
- Algorithms and Analysis (COSC2123).
- Algorithms and Analysis (COSC1285).

Lab Demonstrator:

- Data Warehousing and Mining.
- Practical Data Science.
- Algorithms and Programming Fundamentals in Python.
- Algorithms and Analysis (COSC2123).
- Algorithms and Analysis (COSC1285).
- Professional Computing Practice (COSC1147).
- Advanced Professional Development (COSC2615).

Research Interests

My primary field of research interest is Artificial Intelligence (AI). Within AI, I am interested in problems related to machine learning and data mining, optimisation, and their interdisciplinary applications to real-world applications such as Smart Cities, Internet of Things, Large-Scale IoT Management, Big Data, Cloud Computing, Fog Computing and Optimisation. I have found the applications of machine learning and optimisation to many industry problems to be exciting not only because of their practical value but also as an inspiration for new types of problems that prompt the development of new theories and algorithms that have not been investigated before. As a result, my research work blends both theoretical and practical aspects of problems.

Industry Experience

Due to the nature of my research, I have been working with industry, as a leader or a team member, since early stage of my PhD. I am comfortable and confident to deal with industry. I always learn the business need and the commercial environment of the industry partner before proposing a solution. I always try my best to balance between academia and industry. That can be evident in a range of successful industry projects that I am involved in:

- Worked on a smart city project for the Mornington Peninsula Shire (MPS) of Victoria to optimize traffic and car parking conditions. The project involves development and integration of smart devices, e.g. parking sensors, lighting sensors, amenity sensors in the high demand areas, to establish an open IoT platform. It has the ability to predict future scenarios and provide planning, routing recommendations accordingly. In June 2020, this project has won a second Runner-up prize in the Nexus Smart Cities Competition organized by the City of Melbourne, Runway and ACASE.
- Worked with the Market Intelligence Analytics, RMIT University, developed a prediction model for VTAC - Student pilot using Python and R;
- Worked with Federation University, developed a prediction model for international student recruitment using Python and R;
- Worked with Laminex company, developed an optimisation model for routing and packing for. The objective of this project is to develop an optimisation model for routing and packing fibre boards to hundreds of customers every day. The outcome of this project is routing and packing software and two papers.
- Worked with ITIC, developed evolutionary algorithms for network service optimisation and security. The objective of this project is to develop an evolutionary algorithm to find the shortest possible path in mobile ad-hoc networks. The outcome of this project is three papers.
- Worked with Shiny Pty Ltd, designed intelligence warehouse management with smart-phones. The objective of this project is to develop an evolutionary algorithm to design intelligence warehouse management. The outcome of this project is a warehouse management software and one paper.
- Worked with Salty Egg, developed a framework for optimising calendar events. The objective of this project is to develop an optimised calendar events using evolutionary algorithms.

Successful Research Funding

1. **Digital transformation for construction industry – RISE , 18 months, 1.25M**
2. **Semantic analysis on transactions anti money laundering, Novatti Grp, 36 months, 150k**
3. **Smart city project, 24 months, 1M**

Publication List

I have published **34** papers in journal and peer-reviewed proceedings of international conferences. I have two journal papers under review/ revision or development. I have personally given 12 oral presentations during conferences with scientific selection committee. **Total citation: 599** and **h-index: 13**, according to the Google Scholar.

Journal papers (published/ under review):

1. N. R. Sabar, Say Leng Goh, Ayad Turkey, Graham Kendall. Population-based Iterated Local Search Approach for Dynamic Vehicle Routing Problems. Accepted in IEEE Transactions on Automation Science and Engineering. **Q1, Impact Factor: 5.083.**
2. S Abdullah, Ayad Turkey, and N. R. Sabar. An Evolutionary Variable Neighbourhood Search for the Unrelated Parallel Machine Scheduling Problem. IEEE Access 9 (2021): 42857-42867. **Q1, Impact Factor: 3.745.**
3. Ayad Turkey, N. R. Sabar and A. Song. Hyper-heuristic Local Search Algorithms for Optimisation Problems. Knowledge-Based Systems. 2020 Oct 12;205:106264. **Q1, Impact Factor: 5.921.**
4. N. R. Sabar, Ayad Turkey and E. Chung. Memetic Approach for Heterogeneous Fleet Vehicle Routing Problems with Two-Dimensional Loading Constraints. Swarm and Evolutionary Computation, 58, p.100730. **Q1, Impact Factor: 6.912.**
5. Ayad Turkey, N. R. Sabar and A. Song. Cooperative Evolutionary Heterogeneous Simulated Annealing Algorithm for Google Machine Reassignment Problems. Genetic Programming and Evolvable Machines, Springer, 19, no. 1-2 (2018): 183-210. **Impact Factor: 1.781.**
6. Ayad Turkey, S Abdullah and A Dawod. A Dual-Population Multi Operators Harmony Search Algorithm for Dynamic Optimization Problems. Computers and Industrial Engineering. Elsevier, 117 (2018): 19-28. **Q1, Impact Factor: 4.135.**
7. Ayad Turkey and S Abdullah. A Multi-Population Harmony Search Algorithm with External Archive for Dynamic Optimization Problems. Information Sciences, Elsevier, 272 (2014): 84-95. **Q1, Impact Factor: 5.910.**
8. Ayad Turkey and S Abdullah. A Multi-Population Electromagnetic Algorithm for Dynamic Optimisation Problems. Applied Soft Computing, Elsevier, 22 (2014): 474-482. **Q1, Impact Factor: 5.472.**
9. N. R. Sabar, Ayad Turkey, Abdul Sattar and A. Song. An Evolutionary Hyper-Heuristic to Optimise Deep Belief Networks for Image Reconstruction. Applied Soft Computing. Elsevier, (2019): 105510. **Q1, Impact Factor: 5.472.**
10. N. R Sabar, Ashish Bhaskar, Edward Chung, Ayad Turkey, Andy Song. A self-adaptive evolutionary algorithm for dynamic vehicle routing problems with traffic congestion. Swarm and evolutionary computation, Elsevier, 44 (2019): 1018-1027. **Q1, Impact Factor: 6.912.**
11. S Abdullah, SK Nseef and Ayad Turkey. An Interleaved Artificial Bee Colony algorithm for Dynamic Optimisation Problems. Connection Science 30, no. 3 (2018): 272-284. **Q3, Impact Factor: 1.125.**
12. SK Nseef, S Abdullah, Ayad Turkey, G Kendall. An Adaptive Multi-Population Artificial Bee Colony Algorithm for Dynamic Optimisation Problems. Knowledge-Based Systems, Elsevier, 104 (2016): 14-23. **Q1, Impact Factor: 5.921.**
13. Ayad Turkey, N. R. Sabar and A. Song. Bi-level hyper-heuristic framework for Optimisation Problems. To be submitted to IEEE Transactions on Evolutionary Computation. **Impact Factor: 8.508.**

14. Ayad Turkey, N. R. Sabar and A. Song. Guided Iterated Local Search Algorithm for Google Machine Reassignment Problems. To be submitted to Computer and Operation Research. **Impact Factor: 1.988.**
15. S Abdullah, Ayad Turkey, N R. Sabar. An Evolutionary Variable Neighbourhood Search for the Unrelated Parallel Machine Scheduling Problem. Accepted in IEEE Access **Impact Factor: 3.745.**
16. N. R. Sabar, Ayad Turkey, A. Song and Xiuzhen Zhang. A Decomposition based Evolutionary Hyper-Heuristic Approach for the Large-Scale Vehicle Routing Problem with Time Windows. **Major Revision** for IEEE Transactions on Cybernetics. **Impact Factor: 8.803.**
17. N. R. Sabar, Ayad Turkey, M. Kieu and E. Chung. A Self-adaptive Evolutionary Algorithm for Dynamic Vehicle Routing Problems with Traffic Congestion. Under review for IEEE Transactions on Evolutionary Computation. **Impact Factor: 8.508.**
18. Ayad Turkey. An Adaptive Iterated Local Search Algorithm for Dynamic Patient Admission Scheduling Problems. To be submit to Artificial Intelligence in Medicine.

Conference Proceedings (published/ under review):

1. Ayad Turkey, N. R. Sabar and A. Song. Transferring of Heuristics for Combinatorial Optimisation. To be submitted.
2. Mohammad Saiedur Rahaman, Wei Shao, Flora D. Salim, Ayad Turkey, Doug Bradbrook, Andy Song. MoParkeR : Multi-objective Parking Recommendation. In 33rd International Conference on Scientific and Statistical Database Management (SSDBM 2021)
3. Ayad Turkey, Flora Salim and A. Song. Deep Learning Assisted Memetic Algorithm for Travel Time Estimation Problem. In International Conference on Computational Science, pp. 109-121. Springer, Cham, 2020.
4. Ayad Turkey, N. R. Sabar and A. Song. Hyper Heuristics of Local Search for Combinatorial Optimisation Problems. The 31th Australasian Joint Conference on Artificial Intelligence. Lecture Notes in Artificial Intelligence. Springer, pp. 312-317. Springer, Cham, 2018.
5. N. R. Sabar, Ayad Turkey and A. Song. Adaptive Multi-optimiser Cooperative Co-evolution for Large-Scale Optimisation. In 2019 IEEE Congress on Evolutionary Computation (CEC), pp. 705-712. IEEE, 2019.
6. Ayad Turkey, N. R. Sabar and A. Song. Evolutionary Learning based Iterated Local Search for Google Machine Reassignment Problems. International Conference on Simulated Evolution and Learning. In Australasian Joint Conference on Artificial Intelligence, pp. 312-317. Springer, Cham, 2018.
7. Ayad Turkey, N. R. Sabar and A. Song. Neighbourhood analysis: a case study on Google Machine Reassignment Problem. Australasian Conference on Artificial Life and Computational Intelligence. Lecture Notes in Computer Science, vol 10142, 2017, Springer, Cham
8. Ayad Turkey, I Moser and A. Aleti. An iterated local search with guided perturbation for the heterogeneous fleet vehicle routing problem with time windows and three-dimensional loading constraints. Australasian Conference on Artificial Life and Computational Intelligence. Lecture Notes in Computer Science, Springer, Cham
9. N. R. Sabar, Ayad Turkey, A. Song and Mark Leenders. Multi-population Genetic Algorithm for Cardinality Constrained Portfolio Selection Problems. The International Conference on Computational Science. Lecture Notes in Computer Science, pp. 129-140. Springer, Cham, 2018.
10. N. R. Sabar, Ayad Turkey and A. Song. A Genetic Programming based Iterated Local Search for Software Project Scheduling. In Proceedings of the Genetic and Evolutionary Computation Conference, pp. 1364-1370. ACM, 2018.

11. N. R. Sabar, Ayad Turkey, Abdul Sattar and A. Song. Optimising Deep Belief Networks by Hyper-heuristic Approach. In 2017 IEEE Congress on Evolutionary Computation (CEC), pp. 2738-2745. IEEE, 2017.
12. Ayad Turkey, N. R. Sabar and A. Song. Multi-neighbourhood Great Deluge for Google Machine Reassignment Problem. In Asia-Pacific Conference on Simulated Evolution and Learning, pp. 706-715. Springer, Cham, 2017.
13. Ayad Turkey, N. R. Sabar and A. Song. An Evolutionary Simulated Annealing Algorithm for Google Machine Reassignment Problem. In Intelligent and Evolutionary Systems, pp. 431-442. Springer, Cham, 2017.
14. N. R. Sabar, Ayad Turkey and A. Song. A Multi-Memory Multi-Population Memetic Algorithm for Dynamic Shortest Path Routing in Mobile Ad-hoc Networks. In Pacific Rim International Conference on Artificial Intelligence, pp. 406-418. Springer, Cham, 2016.
15. Ayad Turkey, N. R. Sabar, A. Sattar and A. Song. Parallel Late Acceptance Hill-Climbing Algorithm for the Google Machine Reassignment Problem. In Australasian Joint Conference on Artificial Intelligence, pp. 163-174. Springer, Cham, 2016.
16. Ayad Turkey, N. R. Sabar and A. Song. A Multi-Population Memetic Algorithm for Dynamic Shortest Path Routing in Mobile Ad-hoc Networks. In 2016 IEEE congress on evolutionary computation (CEC), pp. 4119-4126. IEEE, 2016.
17. S Pace, Ayad Turkey, I Moser, A Aleti. Distributing fibre boards: a practical application of the heterogeneous fleet vehicle routing problem with time windows and three-dimensional loading constraints. International Conference in Computational Science, 51 (2015): 2257-2266. Elsevier.
18. Ayad Turkey, S. Abdullah and N. R. Sabar. Meta-heuristic algorithm for Binary Dynamic Optimisation Problems and its Relevancy to Timetabling. 10th international conference on the Practice and Theory of Automated Timetabling (PATAT 2010), pp. 568–573. 26-29 August 2014, York, UK.
19. Ayad Turkey, S. Abdullah and N. R. Sabar. A Hybrid Harmony Search Algorithm for Solving Dynamic Optimisation Problems. The International Conference on Computational Science 29 (2014): 1926-1936 Elsevier.
20. Ayad Turkey, S. Abdullah and N. R. Sabar. Electromagnetic Algorithm for Tuning the Structure and Parameters of Neural Networks. In 2014 IEEE Congress on Evolutionary Computation (CEC), pp. 326-331. IEEE, 2014.
21. Ayad Turkey, S. Abdullah B. McCollum and N. R. Sabar. An Evolutionary Hill Climbing Algorithm for Dynamic Optimization Problems. The 6th Multidisciplinary Int. conf. on Scheduling: Theory and Applications (MISTA 2013), pp. 795–798. Ghent, Belgium (27–30 Aug 2013).

Honors & Awards

- 2017-2018 Data61 PhD Top-up Scholarship from Data61, Australia.
- 2016-2017 Publication award (RM 10k) from The National University of Malaysia, Malaysia.
- 2016-2017 Student Scholarship from Australasian Artificial Intelligence Conference, Australia.
- 2016-2017 RMIT Teaching Certificate.
- 2015-2016 Conference Travel Grant from RMIT, Australia.
- 2014-2019 PhD Scholarship from University of Al-Anbar, Iraq.
- 2014-2015 Publication award (RM 10k) from The National University of Malaysia, Malaysia.
- 2013-2014 Publication award (RM 10k) from The National University of Malaysia, Malaysia.

Professional Activities

Member of Research Groups and Society

1. Member of IEEE Computational Intelligence Society.
2. Context Recognition, Urban Sensing and Intelligence (CRUISE) at RMIT.
3. Member of the Evolutionary Computing and Machine Learning (ECML) at RMIT.
4. Member of the Reactive-Search Community

Program Committee Member for Conferences

1. The 1st International Conference on Data Intelligence and Security
2. The 2018 IEEE World Congress on Computational Intelligence (CEC 2018), IEEE.
3. Australasian Conference on Artificial Life and Computational Intelligence.
4. The 11th International Conference on Simulated Evolution and Learning.
5. The 2016 IEEE World Congress on Computational Intelligence (WCCI 2016), IEEE.
6. The 19th Asia Pacific Symposium on Intelligent and Evolutionary Systems, Springer.
7. The 18th Asia Pacific Symposium on Intelligent and Evolutionary Systems, Springer.

Reviewer for Journals (25 world leading journals)

1. IEEE Transactions on Evolutionary Computation, Impact Factor: 11.169.
2. IEEE Transactions on Industrial Informatics, Impact Factor: 7.377.
3. IEEE Transactions on Fuzzy Systems, Impact Factor: 9.518.
4. IEEE Transactions on Cybernetics, Impact Factor: 11.079.
5. Computers and Industrial Engineering Journal, Elsevier, Impact Factor: 4.135.
6. Neural Computing and Application, Springer, Impact Factor: 4.774.
7. Applied Mathematics and Computation, Elsevier, Impact Factor: 3.472.
8. Expert Systems with Applications , Elsevier, Impact Factor: 5.452.
9. Computational and Applied Mathematics, Elsevier, Impact Factor: 1.360.
10. Advances in Manufacturing, Springer, Impact Factor: 2.568.
11. Computational Intelligence Journal, Wiley, Impact Factor: 1.196.
12. Information Sciences, Elsevier, Impact Factor: 5.910.
13. Applied Soft Computing, Elsevier, Impact Factor: 5.472.
14. International journal of communication systems, Wiley, Impact Factor: 1.319.
15. Journal of Experimental and Theoretical Artificial Intelligence, Impact Factor: 2.111.
16. European Journal of Operational Research, Elsevier, Impact Factor: 4.213.
17. Neurocomputing Journal, Elsevier, Impact Factor: 4.438.
18. SoftwareX Journal, Elsevier.
19. Journal of Heuristics, Springer, Impact Factor: 1.577.
20. Information Systems, Wiley, Impact Factor: 4.188.
21. IEEE Access, Impact Factor: 3.018.
22. Journal of Intelligent Systems, Impact Factor:10.312.
23. Engineering Optimization, Impact Factor: 1.809.
24. Knowledge-Based Systems, Impact Factor: 5.921.
25. IEEE Transactions on Emerging Topics in Computational Intelligence, Impact Factor:8.28
26. Production Manufacturing Research, Impact Factor:3.407

Skills

Programming languages: PYTHON, JAVA, C/C++, PERL, ASSEMBLY LANGUAGE

Mathematical tools: GNU PLOT, MATLAB

Operating systems: GNU/Linux, Windows 98/XP, MAC OS, MS-DOS.

Various: LaTeX, Subversion, Git, LibreOffice, OpenOffice.

Collaborators

I have published/submitted/been working on papers with the following 8 co-authors: Andy Song (RMIT/ Australia), N. R. Sabar (La Trobe university), Graham Kendall (University of Nottingham/UK), Salwani Abdullah (National University of Malaysia/ Malaysia), Aldeida Aleti (Monash University/Australia), Irene Moser (Swinburne University/Australia), Abdul Sattar (Griffith University/ Australia) and Barry McCollum (Queen's University/ N. Ireland).

Research Highlights

Strong publication record in high impact journals and conference proceedings. Total citation counts: **358** and h-index: **10**, according to Google Scholar. Solid experience of bridging academic research and industrial applications.

Academic research and industrial applications:

1. Mornington Smarter Cities and Suburbs Project (SCSP) project.
2. Designed and developed artificial intelligence algorithms for packing and routing for Australian and New Zealand company (Laminex)(completed).
3. Developed artificial intelligence algorithms for Network Service Optimisation and Security (completed).
4. Designed an intelligence warehouse management with smart-phones (completed).
5. Developed a framework for optimising calendar events (ongoing).
6. Developed several novel artificial intelligence frameworks with operators and parameters being self-adapted by learning from previous searching, and capable of self-configuring to deal with various real world problems without human intervention.

Participation

Participant IJCAI Conference from 19-25 August 2017 Melbourne, Australia.

Participant Doctoral Consortium from 5-8 December 2016, Tasmania, Australia.

Presenter Australasian Conference on Artificial Life and Computational Intelligence from 31 Jan-2 Feb 2017, Melbourne, Australia.

Presenter The 29th Australasian Joint Conference on Artificial Intelligence (Springer) from 5-8 December 2016, Tasmania, Australia.

Presenter The 20th Asia-Pacific Symposium on Intelligent and Evolutionary Systems (Springer) from 16-18 November 2016, Canberra, Australia.

- Presenter** The International Conference on Computational Science-ICCS (Elsevier) from 1-3 June 2015, Reykjavík, Iceland.
- Presenter** The International Conference on Computational Science-ICCS (Elsevier) from 1-3 June 2015, Reykjavík, Iceland.
- Presenter** The International Conference on Computational Science-ICCS (Elsevier) from 10-12 June 2014, Cairns, Australia.
- Presenter** 4th Int. Conference on Data Mining and Optimisation from 2-4 September 2012, Langkawi, Malaysia.

References

- Ass. Prof. Andy Song** Computer Science and Information Technology, School of Science. RMIT University, Australia. E-mail: andy.song@rmit.edu.au.
- Prof. Abdul Sattar** Institute for Integrated and Intelligent Systems, Griffith University, Australia. E-mail: A.Sattar@griffith.edu.au.
- Prof. Salwani Abdullah** Faculty of Information Science and Technology, The National University of Malaysia (UKM), 43600 Bangi, Selangor, Malaysia. E-mail: salwani@ftsm.ukm.my.
- Dr. Nasser R. Sabar** Computer Science and Information Technology, La Trobe University, Australia. E-mail: N.Sabar@latrobe.edu.au