Arief B. Koesdwiady

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Summary

A machine learning scientist with a strong background and experience in academic and industrial machine learning research. Currently working as a senior artificial intelligence scientist at General Motors Canada. Experience with various forms of real-world data including image, speech, text, and time-series data.

Experience

General Motors - Canadian Technical Centre — Oshawa, ON, Canada
Senior Artificial Intelligence Specialist — March '18 - Now
Currently responsible for developing machine learning systems for four projects in the area of time series classifications and natural language processing.

Cognitech Inc. — Waterloo, ON, Canada
Machine Learning Scientist — Oct '16 - Feb '18
Responsible for implementing state-of-the-art deep learning algorithms for two projects: **speech multi-keywords spotting** and **time-series anomaly detection**.

University of Waterloo — Waterloo, ON, Canada
Graduate Research Assistant — May '14 - April '18
Developed a vision-based cognitive advanced driver assistance system using Deep Learning. Our work has appeared at national and international news sites: CBC News, The Washington Post, Vice News, and other news outlets.

Teaching Assistant — Oct '14 - Apr '17
Responsible for assisting instructors in the labs and classrooms for several courses in the area of machine learning, artificial intelligence, and control systems.

King Fahd University of Petroleum & Minerals — Dhahran, KSA
Research Assistant — Aug '10 - Jun '13
Developed control and instrumentation systems for two major projects at KFUPM: unmanned ground vehicle (UGV) and solar-powered reverse-osmosis water desalination system.

Freeport-McMoran Indonesia — Tembagapura, Indonesia
Graduate Development Program — Aug '08 - Dec '08
Trained as a process control engineer for gold and copper extraction automation.

Telekomunikasi Indonesia — Bandung, Indonesia
Intern — Jun '07 - Aug '07
Assigned to assist the project management team.

Education

University of Waterloo — Waterloo, ON, Canada
Doctor of Philosophy, Electrical and Computer Engineering (GPA: 4.00/400) — Jan '14 - April '18
Thesis: Large-Scale Traffic Flow Prediction Using Deep Learning in the Context of Smart Mobility.
Supervisor: Fakhri Karray.

King Fahd University of Petroleum & Minerals Dhahran, KSA
Master of Science, Control Systems Engineering (GPA: 3.84/400) Aug '10 - June '13

Thesis: Invariance and Immersion (I&I) Control Design for Unmanned Aerial Vehicles.
Supervisor: Sami Elferik.

Institut Teknologi Bandung Bandung, Indonesia
Bachelor of Engineering, Physics Engineering (GPA: 3.03/400) Aug '04 - Jul '08

Thesis: Development of a 3D-Image Tomography Data Acquisition System for Cylindrical Object Reconstructions.
Supervisor: Deddy Kurniadi

Awards

Faculty of Engineering Awards, University of Waterloo Fall 2016
Given to students who have shown strong merit in the previous term.

Faculty of Engineering Awards, University of Waterloo Spring 2016
Given to students who have shown strong merit in the previous term.

Graduate Research Studentship, University of Waterloo Jan '14 - Dec '17
Given to support students in research based graduate programs.

International Doctoral Student Award, University of Waterloo Jan '14 - Dec '17
Given to support students in research based graduate programs.

Full Graduate Scholarship, KFUPM Aug '10 - June '13
Fully funded scholarship to pursue my Master thesis studies at KFUPM.

Publications

[1] **Arief Koesdwiady**, Alaa El Khatib, and Fakhri Karray. Methods to improve multi-step time series prediction. In *2018 International Joint Conference on Neural Networks (IJCNN)*, pages 1–8. IEEE, 2018.

[2] **Arief Koesdwiady**, Ramzi Abdelmoula, Fakhri Karray, and Mohamed Kamel. Driver inattention detection system: A pso-based multiview classification approach. In *Intelligent Transportation Systems (ITSC), 2015 IEEE 18th Intl. Conf. on*, pages 1624–1629. IEEE, 2015.

[3] **Arief Koesdwiady**, Safaa M. Bedawi, Chaojie Ou, and Fakhri Karray. End-to-end deep learning for driver distraction recognition. In *Image Analysis and Recognition - 14th International Conference, ICIAR 2017, Montreal, QC, Canada, July 5-7, 2017, Proceedings*, pages 11–18, 2017.

[4] **Arief Koesdwiady**, Ridha Soua, and Fakhreddine Karray. Improving traffic flow prediction with weather information in connected cars: A deep learning approach. *IEEE Trans. on Vehicular Tech.*, 65(12):9508–9517, 2016.

[5] **Arief Koesdwiady**, Ridha Soua, Fakhry Karray, and Mohamed S Kamel. Recent trends in driver safety monitoring systems: State of the art and challenges. *IEEE Trans. on Vehicular Tech.*, 2016.

[6] **Arief Koesdwiady** and Fakhri Karray. SAFE: Spectral Evolution Analysis Feature Extraction for Non-Stationary Time Series Prediction. *ArXiv e-prints*, March 2018.

[7] **Arief Koesdwiady** and Fakhri Karray. New results on multi-step traffic flow prediction. *arXiv preprint arXiv:1803.01365*, 2018.

[8] Ridha Soua, **Arief Koesdwiady**, and Fakhri Karray. Big-data-generated traffic flow prediction using deep learning and dempster-shafer theory. In *Neural Nets. (IJCNN), 2016 Intl. Joint Conf. on*, pages 3195–3202. IEEE, 2016.

Please refer to my google scholar page for the complete list of publications.

Skills

Expertise

Machine Learning, Deep Learning, Statistical Learning, Data Visualization, Data Fusion, Intelligent Transportation Systems, Deep Learning based-Image Recognition, Speech Recognition, Natural Language Processing, Smart Mobility, Smart City, Control Systems, Unmanned Systems.

Programming & Tools

Proficient: Python, TensorFlow, Keras, Theano, MATLAB, LabView, LaTeX.

Familiar: Assembly, C, Java, R, Bash.

Professional Activities

Reviewer

IEEE Transactions on Neural Networks and Learning Systems
IEEE Transactions on Cybernetics
International Journal of Robotics and Automation
Control and Intelligent Systems Journal
14th International Conference on Image Analysis and Recognition

Others

Centre for Pattern Analysis and Machine Intelligence graduate seminars organizer
Centre for Pattern Analysis and Machine Intelligence website contain maintainer