Housam Babiker

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Profile Summary

Recent PhD graduate in Computing Science from the University of Alberta. Developed interpretable deep learning models during my PhD. Published four top-tier conference papers (2 COLING, 1 ECML-PKDD, 1 EACL, 1 ECAI) out of my PhD project. Research interests include explainable AI, deep learning, foundation models, Transformers, reinforcement learning, knowledge distillation and their applications to real-world problems.

Education

PhD in Computing Science   Sep. 2016 – Mar. 2023
University of Alberta   *Edmonton, Canada*

MSc in Information Technology   Nov. 2013 – Oct. 2015
Multimedia University   *Melaka, Malaysia*

BSc in Information Technology   Jun. 2007 – Jan. 2011
Multimedia University   *Melaka, Malaysia*

Selected Publications

8. **Housam Babiker**, Mi-Young Kim, Randy Goebel. From Intermediate Representations to Explanations: Exploring Hierarchical Structures in NLP. In the 27 6th European Conference on Artificial Intelligence (**ECAI 2023**). Krakov, Poland. (Acceptance rate: 24%).

7. Shahin Atakishiyev, Mohammad Salameh, **Housam Babiker**, Randy Goebel. Explaining Autonomous Driving Actions with Visual Question Answering. In the 26th IEEE International Conference on Intelligent Transportation Systems (**ITSC 2023**). Bilbao, Spain.

6. **Housam Babiker**, Mi-Young Kim, Randy Goebel. Locally Distributed Activation Vectors for Guided Feature Attribution. In the 27 International Conference on Computational Linguistics (**COLING 2022**). Gyeongju, South Korea. (Acceptance rate: 33%).

5. **Housam Babiker**, Mi-Young Kim, Randy Goebel. Neural Networks with Feature Attribution and Contrastive Explanations. In the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (**ECML-PKDD 2022**). Grenoble, France. (Acceptance rate: 26%).

4. **Housam Babiker**, Mi-Young Kim, and Randy Goebel. DISK-CSV: Distilling Interpretable Semantic Knowledge via Class Semantic Vector. In the 16th Conference of the European Chapter of the Association for Computational Linguistics (**EACL 2021**). Kyiv, Ukraine. (Acceptance rate: 24.7%).

3. **Housam Babiker**, Mi-Young Kim, and Randy Goebel. RANCC: Rationalizing Neural Networks via Concept Clustering. In the 28 International Conference on Computational Linguistics (**COLING 2020**). Barcelona, Spain. (Acceptance rate: 32.9%).

2. **Housam Babiker** and Randy Goebel. An Introduction to Deep Visual Explanation. In Neural Information Processing Systems (**NeurIPS-Workshop 2017**). Long Beach, USA.

1. **Housam Babiker**, Randy Goebel, and, Irene Cheng. Facial expression using SVM classifier on salient mic-macro patterns. In the International Conference on Image Processing (**ICIP 2017**). Beijing, China.

Relevant Experience

Researcher   March. 2023 – Present
Department of computing science, University of Alberta.   *Edmonton, Canada*
- Interpretable RL agent for autonomous diving.
- XAI for computer vision and NLP.

Senior Machine Learning Engineer   May. 2023 – Present
AltaML Inc.   *Edmonton, Canada*
- Working in NLP problems

Machine Learning Engineer   Nov. 2019 – Apr. 2023
AltaML Inc.   *Edmonton, Canada*
- Developed NLP models for different domains (e.g., predictive models, semantic search, model in the loop, keyword extraction) and presented the findings to senior executive management.
- Developed a deep learning model to analyze legal cases by extracting facts, issues, analysis, and conclusions from legal documents. Project link
- Worked on models compression to improve the inference speed (e.g., quantization, TensorRT).

Graduate Research Assistant   Sep. 2016 – Mar. 2023
Department of Computing Science, University of Alberta   *Edmonton, Canada*
- Developed efficient interpretable learning algorithms for deep learning at the XAI lab under the supervision of Prof. Randy Goebel.
- Worked on building models to explain an RL agent for autonomous driving (techniques used: computer vision, natural language processing and transfer learning).
- Developed efficient algorithms for classifying facial emotions.
- Developed efficient algorithms to explain the predictions of pre-trained vision models.

Graduate Research Scholar   Nov. 2013 – Dec. 2015
Faculty of Information Science and Technology, Multimedia University   *Melaka, Malaysia*
- Worked on Biometrics (e.g., face recognition).
- Developed a technique for image blending.

Teaching

Teaching Assistant   Fall 2018
Department of Computing Science, University of Alberta   *Edmonton, Canada*
- Prof. Joerg Sander and Sadaf Ahmed's teaching assistant (TA) for CMPUT 174: Intro. to the Found. of Computation I.

Teaching Assistant   Fall 2017
Department of Computing Science, University of Alberta   *Edmonton, Canada*
- Prof. Anup Basu's TA for CMPUT 414: Introduction to Multimedia Technology.

Teaching Assistant   Fall 2016
Department of Computing Science, University of Alberta   *Edmonton, Canada*
- Prof. Janelle Harms' TA for CMPUT 101: Introduction to Computing.

Technical Skills

Programming: Python (7 years), Matlab (3 years), C# (1 year), C++(1 year), (Swift 0.5 year).
Deep Learning Frameworks: TensorFlow (5 years), Keras (3 years), PyTorch (1 year), OpenCV (1 year).

Selected Honors & Awards

- **Mary Louise Imrie Graduate Student Travel Award**, University of Alberta, Canada, 2022.
- **Highest performance on task 4 of the COLIEE Competition**, Japan, 2018.
- **GSA Travel Award**, University of Alberta, Canada, 2017.
- **Champion of Infineon-MMU Technical Poster Session**, Multimedia University, Malaysia, 2014.
- **Champion of Infineon-MMU Technical Poster Session**, Multimedia University, Malaysia, 2013.
- **Best of the Best Award**, International Conference and Exposition on Innovation of Institution of Higher Learning, Kuala Lumpur, Malaysia, 2013.
- **Research Scholar Award**, Multimedia University, Malaysia, 2013.