

Housam Babiker

CONTACT INFORMATION	Department of Computing Science housamkhalifa.github.io University of Alberta, Edmonton, Canada	Email: khalifab@ualberta.ca
RESEARCH INTERESTS	Research interests include a broad area of Explainable Artificial Intelligence (XAI), Machine Learning, Deep Learning, Reinforcement Learning, and their applications in real-world problems.	
EDUCATION	PhD in Computing Science	Sep. 2016 - Nov 2022
	University of Alberta	Edmonton, Canada
	<ul style="list-style-type: none">Academic Supervisor: Prof. Randy Goebel	
	Research project: Building self-explainable deep neural network	
	MSc in Information Technology	2013 - 2015
	Multimedia University	Melaka, Malaysia
WORK EXPERIENCE	<ul style="list-style-type: none">Academic Supervisor: Prof. Lau Siong Hoe	
	Thesis title: Design and Evaluation of a Shoulder Surfing Resistant Authentication System.	
	Bachelor in Information Technology	2007 - 2011
	Multimedia University	Melaka, Malaysia
	<ul style="list-style-type: none">Thesis title: Face recognition using local graph structure.	
	Graduate Research Assistant	Sep 2019 - Present
WORK EXPERIENCE	Department of Computing Science, University of Alberta	Edmonton, Canada
	<ul style="list-style-type: none">Carrying out research on the development of XAI techniques for deep learning at the XAI lab under the supervision of Prof. Randy Goebel.	
	<ul style="list-style-type: none">Supervisor: rgoebel@ualberta.ca	
	Machine Learning Engineer	Dec. 2019 - August 2022
	Mitacs intern.	Edmonton, Canada
	<ul style="list-style-type: none">Developed NLP models for legal domains, constructions (e.g., predictive models, semantic search, model in the loop, keyword extraction) and presented the findings to senior executive management.	
WORK EXPERIENCE	<ul style="list-style-type: none">Developed NLP models to understand the legal cases in order to segment them in meaningful contexts.	
	<ul style="list-style-type: none">Worked on models compression to improve the inference speed.	
	<ul style="list-style-type: none">Provided regular progress reports to manager both verbally and in writing, and turned data into further actionable decisions.	
	<ul style="list-style-type: none">Mitacs university supervisor: rgoebel@ualberta.ca	
	Research Assistant	Oct. 2018 - Feb. 2019
	Department of Family medicine	University of Alberta, Canada
WORK EXPERIENCE	<ul style="list-style-type: none">Developed a tool to extract medical information from Electronic Medical Records.	
	<ul style="list-style-type: none">Contact: Marjan.Abbasi@albertahealthservices.ca	
	Research Assistant	2013 - 2015
	Information security lab, Multimedia University	Edmonton, Canada
	<ul style="list-style-type: none">Research on biometrics, computer vision and image processing.	

- Supervisor: lau.siong.hoe@mmu.edu.my

RESEARCH ARTICLES

11. **Housam Babiker**, Mi-Young Kim, Randy Goebel, SFFA: Softmax For Feature Attribution (submitted). Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP) (20 pages) 2022.
10. **Housam Babiker**, Mi-Young Kim, Randy Goebel Locally Distributed Activation Vectors for Guided Feature Attribution in COLING 2022(Accepted).
9. **Housam Babiker**, Mi-Young Kim, Randy Goebel Neural Networks with Feature Attribution and Contrastive Explanations in ECML PKDD 2022(in press).
8. Mi-Young Kim, Shahin Atakishiyev, **Housam Babiker**, Nawshad Farruque, Randy Goebel, Osmar R. Zaiane, Mohammad-Hossein Motallebi, Juliano Rabelo, Talat Syed, Hengshuai Yao, Peter Chun. A Multi-Component Framework for the Analysis and Design of Explainable Artificial Intelligence. Machine Learning and Knowledge Extraction, Special Issue on Advances in Explainable Artificial Intelligence - MDPI, 3, pp900-921, 2021.
7. **Housam Babiker**, Mi-young Kid and Randy Goebel. DISK-CSV: Distilling Interpretable Semantic Knowledge via Class Semantic Vector. The 16th conference of the European Chapter of the Association for Computational Linguistics (EACL) 2021. Accepted. April 21-23, Kyiv, Ukraine.
6. **Housam Babiker**, Mi-young Kid and Randy Goebel. RANCC: Rationalizing Neural Networks via Concept Clustering. The 28 International Conference on Computational Linguistics (COLING) 2020. December 8-13 Barcelona, Spain.
5. **Housam Babiker** and Randy Goebel. An Introduction to Deep Visual Explanation. Neural Information Processing Systems (NIPS) 2017 Workshop, Interpreting, Explaining and Visualizing Deep Learning. Long Beach, USA.
4. **Housam Babiker** and Randy Goebel. Using KL-divergence to focus Deep Visual Explanation. Neural Information Processing Systems (NIPS) 2017 Symposium on Interpretable Machine Learning 2017, Long Beach, USA, (Selected for a spotlight presentation).
3. **Housam Babiker**, Randy Goebel, and, Irene Cheng. Facial expression using SVM classifier on salient mic-macro patterns. Proc. International Conference on Image Processing (ICIP), Beijing, China, 2017.
2. Abdullah M., Sayeed S., Muthu S., **Babiker H.**, Azman A., and Ibrahim Yousif. Face recognition with symmetric local graph structure (slgs). Expert Systems with Applications. 41(14)6131-6137 2014.
1. **Housam Babiker** and Eimad Eldin Abdu Abusham. Face Recognition Using Local Graph Structure. International Conference on Human-Computer Interaction. Orlando, Florida, USA 2011.

TEACHING

- **CMPUT 174: Intro. to the Found. of Computation I** Fall 2017
Prof. Jörg Sander and Sadaf Ahmed's teaching assistant (TA) at the University of Alberta.
- **CMPUT 414: Introduction to Multimedia Technology,** Fall 2019
Prof. Anup Basu's TA for the senior undergraduate level course at the University of Alberta
- **CMPUT 101: Introduction to Computing,** Fall 2016
Prof. Janelle Harms's TA for the senior undergraduate level course at the University of Alberta

OTHER TALKS

- **Research Poster at AI Week** May 2022
Presented a paper entitled “Self-explainable models in natural language processing” at AI Week in Edmonton, Canada.
- **COLING 2020, Barcelona** Dec. 2020
Presented a paper entitled “RANCC: Rationalizing Neural Networks via Concept Clustering”(Online).
- **ICIP 2027, China** Sept. 2017
Presented a paper entitled “acial expression using SVM classifier on salient mic-macro patterns”(ICIP, Beijing, China).
- **Reverse EXPO** Feb. 2017
Presented a poster of the “An Introduction to Deep Visual Explanation” article to the audience of diverse background in Edmonton, Canada.

ACADEMIC SERVICE

- Reviewer for the Journal of Artificial Intelligence Research (JAIR), EMNLP 2020, ICDM 2020, ECML-PKDD 2020,2022.
- Local Arrangement Chair, The 2017 IEEE International Conference on Systems, Man, and Cybernetics. Oct 5-Oct 8. Banff, Canada.
- Maintaining the Explainable AI (XAI) lab website <https://sites.ualberta.ca/~amiixai/>.

TECHNICAL STRENGTH

- **Programming:** Python, C++, SQL, Matlab.
- **Frameworks:** Tensorflow, PyTorch, Keras, NLTK, OpenCV, Scikit-Learn, Pandas.
- **Databases:** MySQL
- **Other:** Linux Command Line, Bash Scripting, GitHub, Version Control

HONORS & AWARDS

- **Highest performance on task 4 of the COLIEE competition 2018**, Japan.
- **GSA Travel Award 2017**, university of Alberta.
- Multimedia university **research scholar Award**.
- **Dean List**, Multimedia University.
- 2013 Infineon-MMU Technical Poster Session, Infineon, **Champion**.
- 2014 Infineon-MMU Technical Poster Session, Infineon, **Champion**.
- 2015 Infineon-MMU Technical Poster Session, Infineon, **1st Runner up**.
- Pecipta by Ministry of Education (MOE), **Best of the Best Award**,,International Conference and Exposition on Innovation of Institution of Higher Learning, Nov-2013,Kuala Lumpur Convention Centre, Malaysia.
- Pecipta by Ministry of Education (MOE), **Gold Award**,International Conference and Exposition on Innovation of Institution of Higher Learning, Nov-2013,Kuala Lumpur Convention Centre, Malaysia.
- **Korean Invention Academy Award**, Malaysia,International Conference and Exposition on Innovation of Institution of Higher Learning, Nov-2013,Kuala Lumpur Convention Centre.

- **ITEX Silver Award**, Malaysia, Invention Innovation Technology Exhibition (ITEX) 2013 by MINDS.
- **WIC- Gold Medal**, Seoul, South Korea, World Invention Innovation Contest (WIC) 5-6-June. 2015.
- **ITEX Silver Award**, Invention Innovation Technology Exhibition (ITEX) 2015 by MINDS, Kuala Lumpur Convention Centre, Malaysia.
- Pukyong National University, South Korea, **scholarship for Master of Science (declined)**.
- Multimedia university, **graduate research assistant for PhD, (Declined)**.
- C++ programming Competition, **2nd Runner up**, multimedia university, Melaka, Malaysia.