

Mashaan Alshammari

مشعان عواد الشمري

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I am a machine learning researcher, working on graph clustering and deep learning problems. Previously, I held academic positions in an Australian institute and a Saudi university, where I designed computer science courses for both master's and undergraduate levels.

EDUCATION

Doctor of Philosophy - PhD, Computer Science , <i>The University of Sydney</i> , Thesis title: Graph Filtering and Automatic Parameter Selection for Efficient Spectral Clustering	2017 – 2021
Master of Science, Computer Science , <i>King Fahd University of Petroleum and Minerals (KFUPM)</i> , Thesis title: Human In-Place Action Recognition using Combination of Kinect Data Streams	2013 – 2016
Bachelor of Science, Computer Science , <i>University of Hail</i> ,	2005 – 2010

SKILLS

Research & Development	1st author in 13+ research papers , 75+ verified reviews on Web of Science.
Technical	Previously Java and Matlab, currently using Python's ML libraries (pytorch, jax, flax, PyG, scikit-learn).
Curriculum design	Designing CS courses following Australian Qualifications Framework (AQF) and Saudi Arabia's NCAAA.
Social media	14.5K+ views and 350+ watch hours for my YouTube educational videos; 40+ stars on my Github .

PROFESSIONAL EXPERIENCE

Curriculum Development Collaborator Sydney Polytechnic Institute <ul style="list-style-type: none">• Participated in curriculum development for a Master of Data Science and Bachelor of Computing.• Designed the outline and planner documents for courses: Database Systems (U211), Cybersecurity and Information Assurance (U312), and Full-stack development (U322).	<i>Jul 2023 – Present</i> <i>Sydney, Australia</i>
Machine Learning Researcher Freelance <ul style="list-style-type: none">• Working on machine learning research with researchers from the University of Sydney and KFUPM.• Our research focuses on Graph Convolutional Network (GCN) and Unsupervised Domain Adaptation (UDA).• Designed experiments using python ML libraries (pytorch, jax, flax, scikit-learn).	<i>Jun 2022 – Present</i> <i>Riyadh, Saudi Arabia</i>
Assistant Professor University of Hail <ul style="list-style-type: none">• Participated in curriculum design and lecturing for multiple graduate and undergraduate computer science courses.• Adapted new teaching strategies to teach the following courses: data structures (ICS202), advanced database (ICS434), and machine learning for big data (CSAI510).	<i>Jan 2021 – Jun 2022</i> <i>Hail, Saudi Arabia</i>
Curriculum Development Collaborator Sydney Polytechnic Institute <ul style="list-style-type: none">• Participated in curriculum development for a Master of Data Science.• Designed lecture slides, assignments, practical sessions, and exams for courses: Database Systems and Infrastructure (MDS604), Mathematics for data science (MDS602), and Artificial Intelligence and Innovation (MDS607).	<i>Sep 2020 – Mar 2021</i> <i>Sydney, Australia</i>
System Engineer SABIC <ul style="list-style-type: none">• In charge of securing and maintaining the plant network components.• Upgraded obsolete network components during online operation.	<i>Aug 2010 – May 2012</i> <i>Jubail, Saudi Arabia</i>
Intern Saudi Aramco <ul style="list-style-type: none">• Completed cooperative training at EXPEC ARC as a member of Computational Modeling Team.• Developed a GUI interface populating the simulator output, large text files, into a database.	<i>Jun 2009 – Jan 2010</i> <i>Dhahran, Saudi Arabia</i>

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SELECTED PROJECTS

My YouTube Channel

pytorch, jax, Jupyter

- I create videos explaining machine learning methods. The video starts by reading a paper or a book and ends with code.
- I cover topics like how a convolutional layer is implemented as matrix multiplication in pytorch.

VisionTransformer-MNIST

ViT, pytorch, Jupyter

- Implementation of "An Image is Worth 16x16 Words: Transformers for Image Recognition at Scale", published by Google research.
- Vision transformers replaces CNNs as the preferred method for image classification.

Graph Convolutional Networks (GCNs)

GNNs, GCNs, pytorch, Jupyter

- Implementation of the paper "Semi-Supervised Classification with Graph Convolutional Networks", which was published in ICLR 2017.
- Graph Convolutional Networks (GCNs) perform node classification in graphs.

ADDA

GANs, pytorch, Jupyter

- Implementation of the paper "Adversarial Discriminative Domain Adaptation", which was published in CVPR 2017.
- ADDA uses GANs to perform unsupervised domain adaptation (UDA).

SELECTED PUBLICATIONS

- **Mashaan Alshammari**, John Stavrakakis, Adel F. Ahmed, Masahiro Takatsuka: "Graph Construction using Principal Axis Trees for Simple Graph Convolution.", arXiv:2302.12000, 2023.
- **Mashaan Alshammari**, John Stavrakakis, Adel F. Ahmed, Masahiro Takatsuka: "Random projection forest initialization for graph convolutional networks.", MethodsX, 2023.
- **Mashaan Alshammari**, John Stavrakakis, Adel F. Ahmed, Masahiro Takatsuka: "Random projection tree similarity metric for SpectralNet.", Array, 2023.
- **Mashaan Alshammari**, John Stavrakakis, Adel F. Ahmed, Masahiro Takatsuka: "The Effect of Points Dispersion on the k-nn Search in Random Projection Forests.", IEEE Access, 2022.
- **Mashaan Alshammari**, John Stavrakakis, Masahiro Takatsuka: "A Parameter-Free Graph Reduction for Spectral Clustering and SpectralNet.", Array, 2022.
- **Mashaan Alshammari**, John Stavrakakis, Masahiro Takatsuka: "Refining a k-nearest neighbor graph for a computationally efficient spectral clustering.", Pattern Recognition, 2021.
- **Mashaan Alshammari**, Masahiro Takatsuka: "Approximate spectral clustering density-based similarity for noisy datasets.", Pattern Recognition Letters, 2019.
- **Mashaan Alshammari**, Masahiro Takatsuka: "Approximate spectral clustering with eigenvector selection and self-tuned k.", Pattern Recognition Letters, 2019.

SELECTED ACTIVITIES

Journal Reviewer

- [Pattern Recognition Journal](#)
- [Neurocomputing Journal](#)
- [Information Sciences Journal](#)

Conference Organization

- Program committee, 30th International Conference on Neural Information Processing (ICONIP2023), Changsha, China, November 20-23, 2023.
- Technical Program Committee, 7th International Conference on Data Science and Machine Learning Applications (CDMA2022), Riyadh, Saudi Arabia, March 1-3, 2022.