

# 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

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

## SKILLS

<b>Research &amp; Development</b>	1st author in <a href="#">13+ research papers</a> , <a href="#">75+ verified reviews</a> on Web of Science.
<b>Technical</b>	Previously Java and Matlab, currently using Python's ML libraries (pytorch, jax, flax, PyG, scikit-learn).
<b>Curriculum design</b>	Designing CS courses following Australian Qualifications Framework (AQF) and Saudi Arabia's NCAAA.
<b>Social media</b>	13K+ views and 300+ watch hours for my <a href="#">YouTube</a> educational videos; 40+ stars on my <a href="#">Github</a> .

## PROFESSIONAL EXPERIENCE

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