

# Mashaan Alshammari

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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. I designed CS material at masters 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> ."	<b>2017 — 2021</b>
<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> ."	<b>2013 — 2016</b>
<b>Bachelor of Science, Computer Science</b> , <i>University of Hail</i> ,	<b>2005 — 2010</b>

## SKILLS

<b>Research &amp; Development</b>	1st author in <a href="#">13+ research papers</a> , <a href="#">70+ verified reviews</a> on Web of Science.
<b>Technical</b>	Previously Java and Matlab, currently using Python's ML/DL 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>	10K+ views and 200+ watch hours for my <a href="#">YouTube</a> educational videos; 35+ stars on my <a href="#">Github</a> .

## PROFESSIONAL EXPERIENCE

<b>CURRICULUM DEVELOPMENT COLLABORATOR</b> <i>Sydney Polytechnic Institute</i>	<b>Jul 2023 — Present</b> <i>Sydney, Australia</i>
<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 (<b>U211</b>), Cybersecurity and Information Assurance (<b>U312</b>), and Full-stack development (<b>U322</b>).</li></ul>	
<b>MACHINE LEARNING RESEARCHER</b> <i>Freelance</i>	<b>JUN 2022 — Present</b> <i>Riyadh, Saudi Arabia</i>
<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>	
<b>ASSISTANT PROFESSOR</b> <i>University of Hail</i>	<b>JAN 2021 — JUN 2022</b> <i>Hail, Saudi Arabia</i>
<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 (<b>ICS202</b>), advanced database (<b>ICS434</b>), and machine learning for big data (<b>CSAI510</b>).</li></ul>	
<b>CURRICULUM DEVELOPMENT COLLABORATOR</b> <i>Sydney Polytechnic Institute</i>	<b>SEP 2020 — MAR 2021</b> <i>Sydney, Australia</i>
<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 (<b>MDS604</b>), Mathematics for data science (<b>MDS602</b>), and Artificial Intelligence and Innovation (<b>MDS607</b>).</li></ul>	
<b>SYSTEM ENGINEER</b> <i>SABIC</i>	<b>AUG 2010 — MAY 2012</b> <i>Jubail, Saudi Arabia</i>
<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>	
<b>INTERN</b> <i>Saudi Aramco</i>	<b>JUN 2009 — JAN 2010</b> <i>Dhahran, Saudi Arabia</i>
<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>	

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## SELECTED PROJECTS

### [My YouTube Channel](#)

*pytorch, jax, Jupyter Notebook*

- 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 Notebook*

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

### [Graph Convolutional Networks \(GCNs\)](#)

*GNNs, GCNs, pytorch, Jupyter Notebook*

- 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 Notebook*

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

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## 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.

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## SELECTED ACTIVITIES

### Journal Reviewer

- [Pattern Recognition Journal](#)
- [Information Sciences Journal](#)
- [Knowledge-Based Systems 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.