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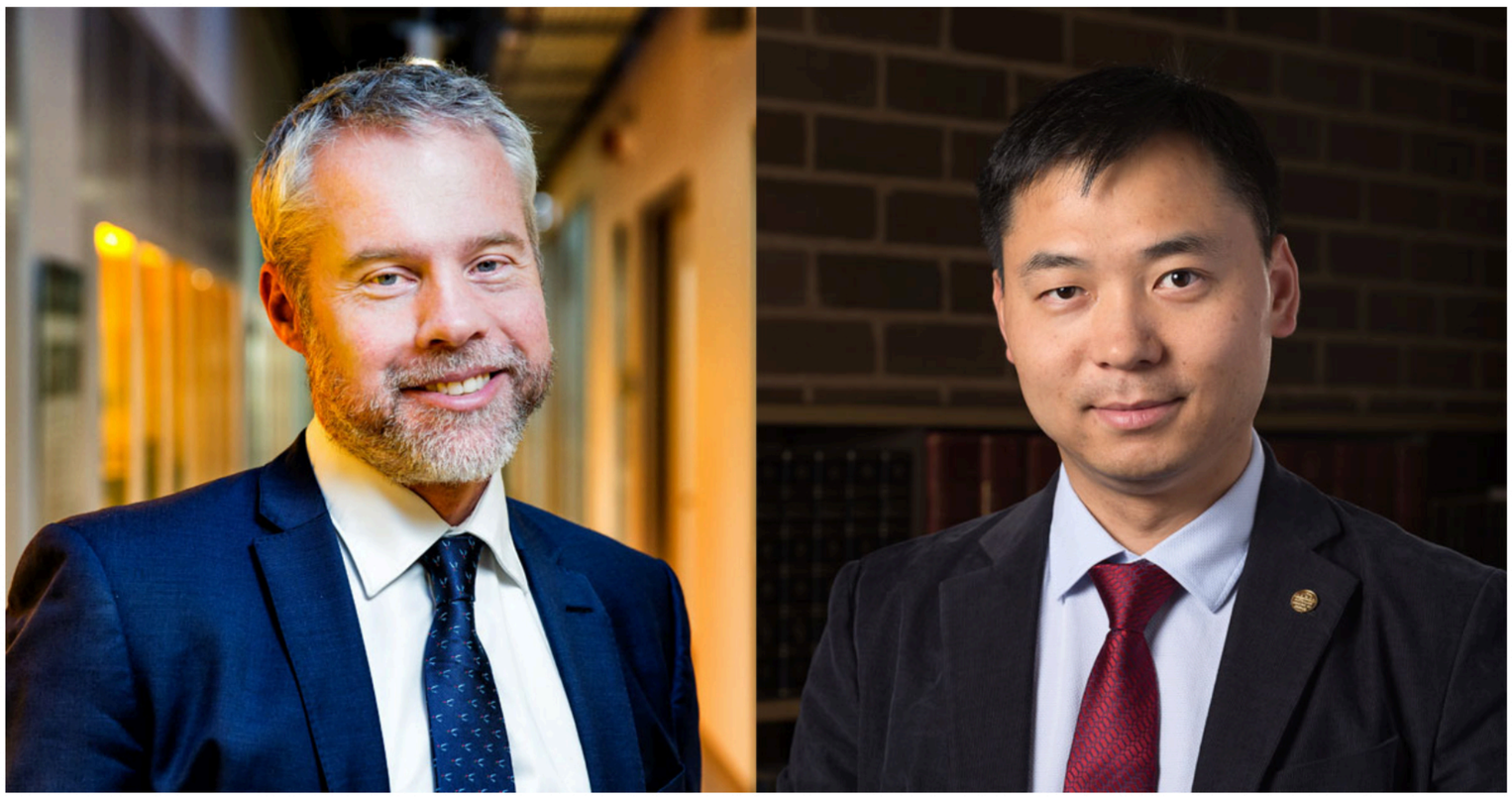
Academy Fellows get their Eureka moment

November 26, 2020



Professor Ben Eggleton FAA FTSE (left) and Professor Dacheng Tao FAA.

Two Academy Fellows, Professor Ben Eggleton and Professor Dacheng Tao, have each won a 2020 Australian Museum Eureka Prize.

Professor Tao won the Eureka Prize for Excellence in Data Science. His work on deep learning, which imitates the brain's ability to process data and make decisions, has enabled the design of algorithms for object detection and image enchancement.

Professor Eggleton and his team of Dr Eric Mägi, Dr Moritz Merklein, Dr Alvaro Casas Bedoya, Dr Yang Liu and Associate Professor Stephen Madden won the Eureka Prize for Outstanding Science in Safeguarding Australia. A microchip produced by the team, which uses the interactions between light and sound, can improve microwave signal processing in performance, efficiency and cost.

Four Fellows were also Eureka Prizes finalists:

- Professor Geordie Williamson, a world-leading mathematician in geometric representation theory, was a finalist for the CSIRO Eureka Prize for Leadership in Innovation and Science
- Professor Michelle Coote, regarded as a pioneer in computational chemistry for modelling radical polymerisation processes, was a finalist along with her team for the UNSW Eureka Prize for Scientific Research
- Professor Chris Dickman is internationally recognised for his contributions to our understanding of terrestrial vertebrates. His Cat Ecology, Impact and Management team was a finalist for the Eureka Prize for Applied Environmental Research
- Professor Robert Parton, known for his pioneering work on the plasma membrane organisation of mammalian cells, was a finalist along with the BioNanoVR team for the ANSTO Eureka Prize for Innovative Use of Technology.

Watch the 2020 Eureka Prizes award ceremony

News_

Professor Dacheng Tao named ACM Fellow

13 December 2019

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University of Sydney AI expert and one of the world's most highly cited researchers, Professor Dacheng Tao has been named a Fellow of the Association for Computing Machinery.

Professor Dacheng Tao.

University of Sydney computer science expert and Director of the UBTECH Sydney Artificial Intelligence Centre, Professor Dacheng Tao, has been awarded one of computer science's most prestigious accolades - Fellow of the Association for Computing Machinery.

The ACM Fellows comprise of an elite group that represents less than 1 percent of the association's global membership. This year 58 Fellows have been selected for significant contributions in areas including artificial intelligence, cloud computing, combating cybercrime, quantum computing and wireless networking.

Professor Tao's research has focused on artificial intelligence (AI), computer vision, deep learning, statistical learning and their application to neuroscience, robotics and medical informatics.

"I am honoured to be elected as a Fellow of the ACM, a leading international organisation in computer science and engineering," Professor Tao said.

"This recognition will help me strengthen my commitment to research in artificial intelligence from theory to practice.

"I would like to present my sincere appreciation to the University of Sydney for providing an awesome platform, and to my students, fellow researchers, collaborators and colleagues who have worked with me over the past years."

The accomplishments of the 2019 ACM Fellows underpin the technologies that define the digital age and benefit society.

"Computing technology has had a tremendous impact in shaping how we live and work today," ACM President Cherri Pancake said.

"All of the technologies that directly or indirectly influence us are the result of countless hours of collaborative and/or individual work, as well as creative inspiration and, at times, informed risk-taking.

"Each year, we look forward to welcoming some of the most outstanding individuals as Fellows. The ACM Fellows program is a cornerstone of our overall recognition effort. In highlighting the accomplishments of the ACM Fellows, we hope to give credit where it is due, while also educating the public about the extraordinary array of areas in which computing professionals work."

Earlier this year, Professor Tao was named as one of the world's most highly cited researchers.

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27 February 2019

Academic recognised for excellence in data mining

University of Sydney artificial intelligence expert Professor Dacheng Tao has been recognised for excellence in data mining by the Institute of Electrical and Electronics Engineers.

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News_

AI expert awarded one of America's highest science honours

21 November 2017

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University of Sydney Professor of Computer Science Dacheng Tao has been named a Fellow of the American Association for the Advancement of Science (AAAS), one of the highest honours in the field.

Professor Dacheng Tao.

Professor Tao was elected as an AAAS Fellow as part of the Engineering section.

"It is my great honour and privilege to be elected as a Fellow of the American Association for the Advancement of Science," Professor Tao said.

"This election recognises my significant contributions to artificial intelligence (AI), specifically computer vision, deep learning and statistical learning."

University of Sydney Vice-Chancellor and Principal Dr Michael Spence congratulated Professor Tao on his honour.

"The recognition of Professor Tao by this prestigious international organisation is a fitting testament to his leadership in computer science research. The University is enormously proud of his success," Dr Spence said.

Professor Tao's research predominantly covers AI's applications to robotics, neuroscience, medical informatics and video surveillance.

Earlier this year he was appointed the Director of the newly established UBTECH Sydney Artificial Intelligence Centre [https://sydney.edu.au/news-opinion/news/2017/06/08/-university-partners-with-ubtech-to-explore-the-future-of-ai.html] and was also awarded an ARC Australian Laureate Fellowship [https://sydney.edu.au/news-opinion/news/2017/06/05/fellowships-and-training-centres-accelerate-research-capacity.html#uniqueId_zVPsmv8g_1_button] to develop a suite of original models and algorithms for processing and understanding videos captured by moving cameras.

Professor Tao was recently recognised in the Clarivate Analytics 2017 Highly Cited Researchers List [https://sydney.edu.au/news-opinion/news/2017/11/16/seven-academics-named-in-influential-highly-cited-scholars-list.html] , where he was one of one just 147 academics around the world to be recognised in two fields – computer science and engineering. In 2015 and 2016 he was ranked by Thomson Reuters as a Highly Cited Researcher for Engineering and Computer Science.

Professor Tao was awarded a 2015 Scopus Eureka Prize for Excellence in International Scientific Collaboration, and was a finalist for the University of Technology Sydney Eureka Prize for Excellence in Data Science [https://sydney.edu.au/news-opinion/news/2017/07/28/four-sydney-finalists-announced-in-eureka-science-awards.html] this year.

Founded in 1848, the AAAS is the world's largest multidisciplinary scientific society and seeks to advance science, engineering and innovation throughout the world for the benefit of all people.

Election as an AAAS Fellow is an honour bestowed upon AAAS members by their peers.

This year 396 members have been awarded this honour because of their scientifically or socially distinguished efforts to advance science or its applications. Professor Tao is one of only two Australian academics named as Fellows this year.

A formal announcement will be made in the journal *Science* on 24 November and new Fellows will be presented with an official certificate and rosette pin at the 2018 AAAS Annual Meeting in Austin, Texas next February.

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Academic recognised for excellence in data mining

27 February 2019

Professor Dacheng Tao honoured by the Institute of Electrical and Electronics Engineers

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University of Sydney artificial intelligence expert Professor Dacheng Tao has been recognised for excellence in data mining by the Institute of Electrical and Electronics Engineers.

Professor Dacheng Tao [https://sydney.edu.au/engineering/people/dacheng.tao.php] , Director of the UBTECH Sydney Artificial Intelligence Centre [https://www.sydney.edu.au/engineering/our-research/data-science-and-computer-engineering/ubtech-sydney-artificial-intelligence-centre.html] has focused his research on the intersection between artificial intelligence and data mining, with his most recently awarded work having achieved an effective, robust and succinct representation of original high-dimensional, noisy and unstructured raw data.

Representation learning is essential because real-world data such as images, video, and text are mathematically and computationally inconvenient for specific machine learning tasks, such as classification and clustering.

“It’s an honour to be awarded an IEEE ICDM research contributions award," said Professor Tao, from the School of Computer Science [https://www.sydney.edu.au/engineering/schools/school-of-computer-science.html] .

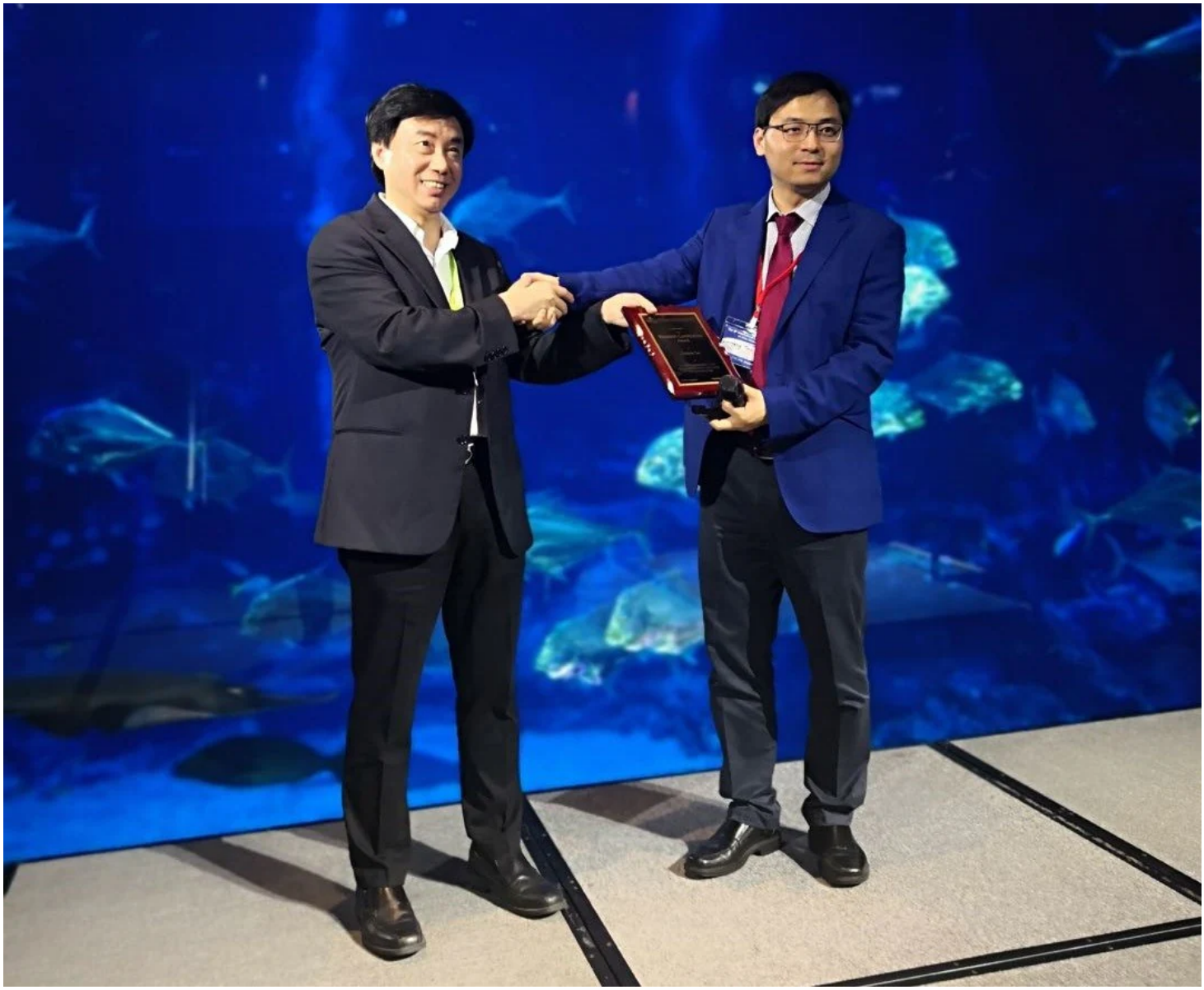
"Not only has it recognised my effort and contributions to date, it has also strengthened my commitment to research in data mining and artificial intelligence, in particular representation learning.

“The field of artificial intelligence is blossoming; it’s driving both economic growth and social progress in what is now the world’s fourth industrial revolution.”

Having recently completed an ARC Future Fellowship, Professor Tao’s recent research has concentrated on developing multi-view learning, a process which allows machines or robots to consider data from multiple data sets, forming a more comprehensive view and allowing them to behave accordingly.

“Multi-view learning is essential for intelligent systems, in that those systems need to complete tasks based on the input data from different sensors," explains Professor Tao.

“We have developed algorithms that can learn an effective integrated feature from different sources for the subsequent processing, such as classification, with theoretical guarantees.



Professor Dacheng Tao awarded by IEEE ICDM steering committee chair, Professor Xindong Wu in Singapore

“I’m now leading a team of early career researchers and research students to work on my ARC Laureate Fellowship. We aim to devise a suite of algorithms for processing and understanding videos captured by moving cameras, and to establish mathematical foundations for deep learning-based computer vision.

“The project has already yielded considerable results — such as explaining why deep learning is superior to shallow learning and recovering depth information from a single RGB image."

Rather than developing artificial intelligence to replace humans, Professor Tao instead believes its primary purpose is to augment the human experience, filling in gaps or performing tasks that humans are incapable of doing.

“My team is working to ensure our developments will enhance humankind’s capability, increase humans’ productivity and improving our quality of life,” says Professor Tao.

“Already we have developed algorithms to track human pose from videos and thus to help robots mimic human’s activities.”

Having authored over five-hundred papers on such topics as machine intelligence, pattern analysis, and image processing, Professor Tao’s work has also been cited over 36,000 times within both the fields of Engineering and Computer Science.

Working with his fellow researchers and students, Professor Tao is adamant his recent achievement is the result of a group effort.

“I would like to extend sincere appreciations to my students, fellow researchers, collaborators and colleagues who have worked with me over the past years – this recent award just as much is about their work as it is mine,” says Professor Tao.

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