

## In the spotlight



### Direct Angular Rate Estimation Without Event Motion-Compensation At High Angular Rates

*IEEE International Conference on Robotics and Automation*  
SUTD Authors: Matthew Ng, Xinyu Cai, Shaohui Foong  
*Engineering Product Development (EPD)*

Event cameras, designed to mimic the neural architecture of the eye, capture pixel-wise intensity changes asynchronously, unlike traditional frame-based cameras. As events are spatiotemporal, motion compensation is needed to generate a sharp image for feature-based image registration. In camera state estimation, this creates a causality dilemma where prior motion knowledge is required to estimate motion. Feature-based image registration is commonly used for state estimation, but often suffers from edge smoothing due to inadequate motion compensation. The paper introduces a Fourier-based angular rate estimator that estimates angular rates directly from non-motion compensated event images. This approach eliminates the need for external motion priors and bypasses the smoothing issues associated with motion blur by working in the frequency domain. It is real-time performant using an NVIDIA Jetson Xavier NX (a 15W credit card-sized computer) and capable of estimating angular rates, up to  $3960^\circ/\text{s}$ .



*"Feature-based image registration is commonly used for state estimation, but often suffers from edge smoothing due to inadequate motion compensation. The paper introduces a Fourier-based angular rate estimator that estimates angular rates directly from non-motion compensated event images."*

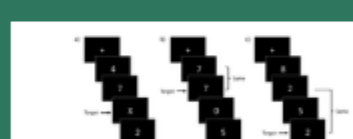
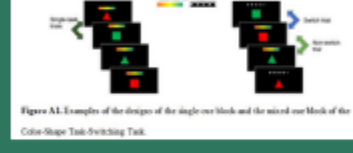
- Matthew Ng

## Congratulations! Dr Yow Wei Quin, HASS

for her paper 'A Novel Dual-Language Touch-Screen Intervention to Slow Down Cognitive Decline in Older Adults: A Randomized Controlled Trial' being published in the journal *Innovation in Aging*\* by Oxford University Press.

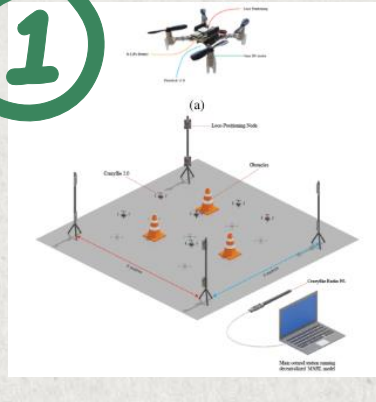
\*Top 10% Journal ranked by Clarivate on Gerontology

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## TRAILBLAZERS

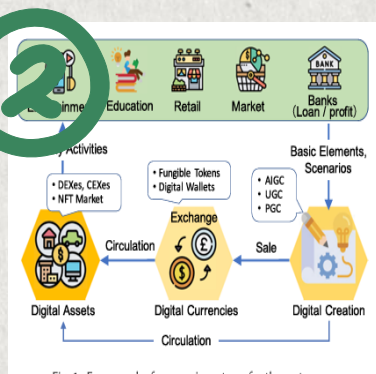
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### Multi-Target Pursuit by a Decentralized Heterogeneous UAV Swarm using Deep Multi-Agent Reinforcement Learning

*2023 IEEE International Conference On Robotics And Automation, ICRA*  
SUTD Authors: Maryam Kouzeghar, Song Youngbin, Malika Meghjani  
*Engineering Product Development (EPD), Information Systems Technology and Design (ISTD)*

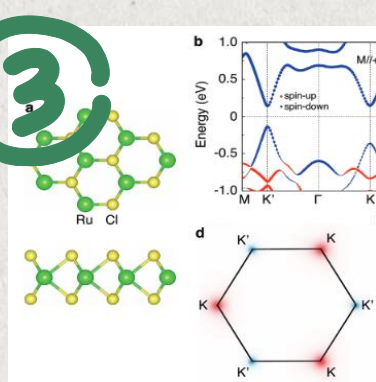
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### Economic Systems in the Metaverse: Basics, State of the Art, and Challenges

*ACM Computing Surveys*  
SUTD Author: Xiong Zehui  
*Information Systems Technology and Design (ISTD)*

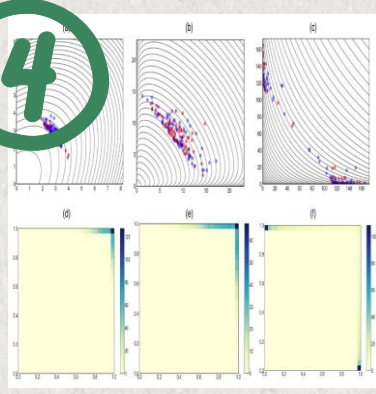
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### Half-Valley Ohmic Contact: Contact-Limited Valley-Contrasting Current Injection

*Advanced Functional Materials*  
SUTD Authors: Feng Xukun, Yang Shengyuan A., Ang Yee Sin  
*Science, Mathematics and Technology (SMT)*

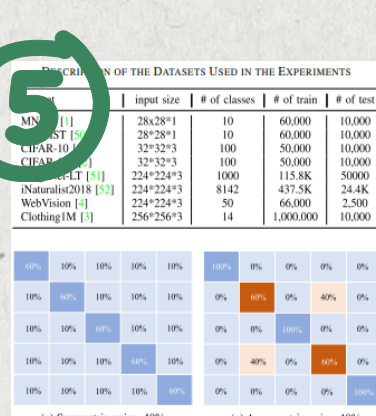
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### Achieving Efficiency in Black-Box Simulation of Distribution Tails with Self-Structuring Importance Samplers

*Operations Research*  
SUTD Author: Murthy Karthyek  
*Engineering Systems and Design (ESD)*

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### OHD: An Online Category-Aware Framework for Learning With Noisy Labels Under Long-Tailed Distribution

*IEEE Transactions On Circuits And Systems For Video Technology*  
SUTD Author: Zhang Qihao  
*Information Systems Technology and Design (ISTD)*

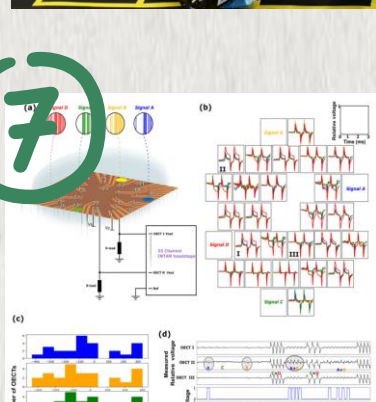
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### Applications of a vacuum-actuated multi-material hybrid soft gripper: lessons learnt from RoboSoft manipulation challenge

*Journal Of Parallel And Distributed Computing*  
SUTD Authors: Saikrishna Dontu, Elgar Kanhere, Pablo Valdivia Y. Alvarado, Thileepan Stalin, Soh Gim Song, Audelia Gumarus Dharmawan  
*DManD Centre, Engineering Product Development (EPD), Robot Innovation Lab*

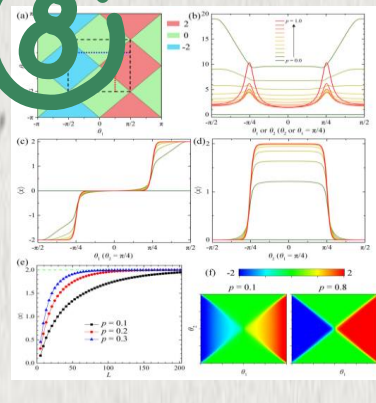
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### Neuromorphic Signal Classification Using Organic Electrochemical Transistor Array and Spiking Neural Simulations

*IEEE Sensors Journal*  
SUTD Author: Ankush Kumar  
*Engineering Product Development (EPD)*

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### Long-term evolution of non-Hermitian systems in quantum-walk dynamics

*Physical Review B*  
SUTD Author: Fu Pei-Hao  
*Science, Mathematics and Technology (SMT)*

