LENS UTD

A look into SUTD's learning, exploration, notable achievements and success

June 2025

In the spotlight

A foundation model-based framework for unsupervised gaze anomaly detection

Knowledge-Based Systems

SUTD Authors: Kritika Johari, Yow Wei Quin, Tan U-Xuan

"We use AI to detect when students mentally drift during online classes, no labels or wearables needed."

- Kritika Johari

Online learning platforms often struggle to tell whether students are truly paying attention, especially when they're distracted by emails, phone notifications, or background noise. In our study, we developed an AI-based system called Gaze-READ that can detect signs of distraction by analyzing where students look on the screen during a lecture. Using eye-tracking data, we trained a foundation model to learn what "normal" attentive gaze behavior looks like.

The system then compares new gaze data to this baseline and flags unusual patterns, like frequent glances away from the lecture content, as potential distractions. Importantly, this method works without needing any labeled training data or manual setup. It can run in real time and adapt to different types of students and lecture formats. Our findings show that this approach can help educators identify attention drops early, making online learning more engaging and responsive.

TRAILBLAZERS

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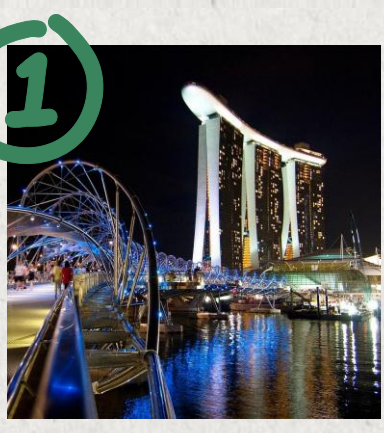

Urban Data Analytics for Urban Heat Island Mitigation: A Case Study of Urban Design Exploration for Singapore's Tropical Climate

Case Studies In The Environment

SUTD Authors: Elif Esra Aydin, Peter Ortner, Praveen Govindarajan, Tay Jingzhi, Chen Zebin

ASD

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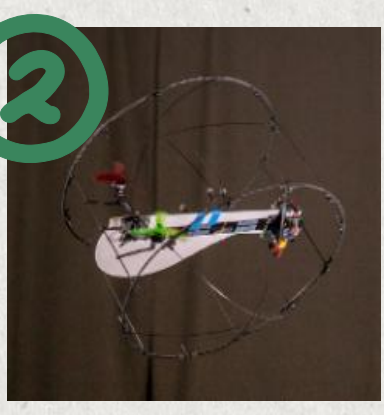

ATOM: Design and development of a novel two-actuator hybrid land-air robot

International Journal Of Robotics Research

SUTD Authors: Hitesh Bhardwaj, Luke Soe Thura Win, Shane Kyi Hla Win, Cai Xinyu, Foong Shaohui

EPD, Temasek Lab

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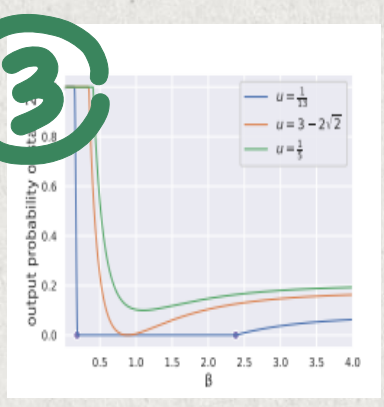

Detecting Signatures of Criticality Using Divergence Rate

Entropy

SUTD Authors: Chan Tenzin, Soh De Wen

ISTD

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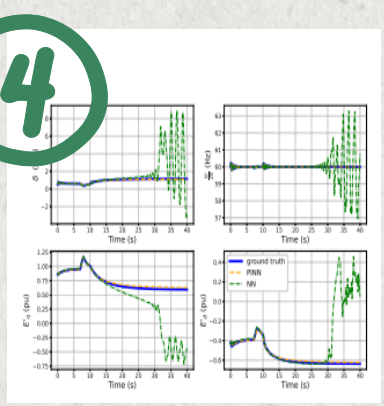

Physics-Informed Neural Networks for Privacy-Preserving Model Sharing in Power Systems

2024 IEEE PES Innovative Smart Grid Technologies Europe

SUTD Authors: Ilayda Canyakmaz, Antonios Varvitsiotis

ESD

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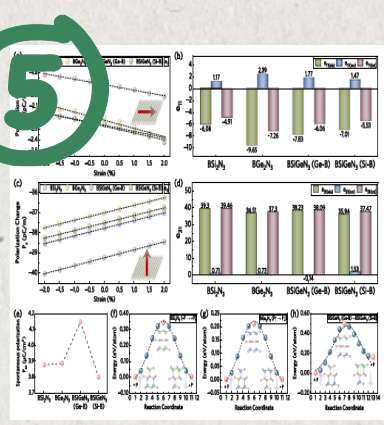

BA2N3 (A=Si, Ge) monolayers: Multifunctional 2D polar semiconductors with intercalation-induced centrosymmetry breaking

Physical Review Materials

SUTD Authors: Rui Peng, Ang Yee Sin

SMT

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Building 'soil-darity': Identifying personal priorities to facilitate greater participation in community composting initiatives to enhance urban resilience in Singapore

City And Environment Interactions

SUTD Author: Sarah Chan Hian May

LKYCIC

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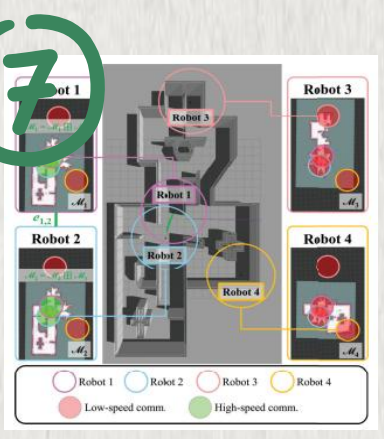

MEF-Explore: Communication-Constrained Multi-Robot Entropy-Field-Based Exploration

IEEE Transactions On Automation Science And Engineering

SUTD Authors: Khattiya Pongsirijinda, Cao Zhiqiang, Billy Lau Pik Lik, Tan U-Xuan

EPD

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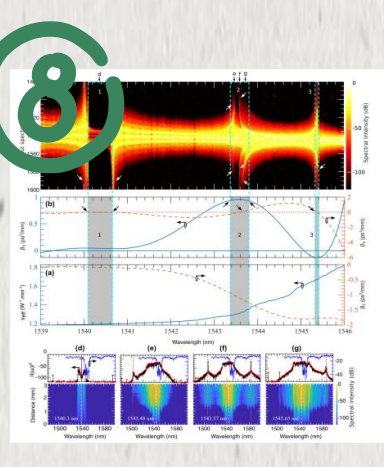

Theoretical studies of modulation instability, Fermi-Pasta-Ulam recurrence and pattern formation in an ultra-silicon-rich-nitride Bragg grating

Nanophotonics

SUTD Authors: Amdad Chowdury, Dawn Tan T. H.

Photon Devices and System Group