

January 2022

IMPact@SUTD is a regular update featuring works by SUTD Faculty, Researchers, Students and Research Centres/Labs. We hope to create awareness of the Research by SUTD within the SUTD community and beyond. Share with us your SUTD works today so that we can include it in our next update.



**Aakanksha Pant**  
Research Associate,  
SGP Healthcare  
Program

## CONGRATULATIONS!

**Aakanksha Pant for winning 3<sup>rd</sup> Prize for her work in fresh vegetable 3D Printing in the "Shiyin Cup 3D Food Printing and Precision Nutrition" Award.**

\*The prize which is sponsored by the company Shiyin (时印), a food printer manufacturer in China, was awarded for the paper titled "3D food printing of fresh vegetables using food hydrocolloids for dysphagic patients" published in food hydrocolloids.



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Cited and  
Hot Paper



**A Reinforcement Learning Based Dirt-Exploration for Cleaning-Auditing Robot**  
Sensors

SUTD Author: Thejus Pathmakumar, Mohan Rajesh Elara, Braulio Félix Gómez, and Balakrishnan Ramalingam

"This research focuses on a novel reinforcement learning-based experience-driven dirt exploration strategy for a cleaning-auditing robot. The robot uses a deep reinforcement learning technique to explore the dirt accumulations by training in simulated environments with different dirt patterns. The trained policy is validated in a real-world environment using an in-house developed cleaning audit robot called BELUGA."

--- Thejus Pathmakumar



**Conceptual design and performance optimization of a nighttime electrochemical system for electric power generation via radiative cooling**  
Energy

SUTD Author: Yee Sin Ang

"The conceptual design of a nighttime electrochemical system (NECS) based on radiative cooling for generating electrical power from dark night sky is proposed. Such a low temperature and passive device is capable of generating electricity during nighttime without active input of heat."

--- Yee Sin Ang



**Extreme-user conditions to enhance design creativity and empathy-application using visual impairment**  
International Journal of Design Creativity and Innovation

SUTD Author: Sujithra Raviselvam and Kristin L Wood

"Our work demonstrated that being more immersed in user research through simulated experiences could improve both design creativity and inclusiveness when compared to just being briefed about the end users. This is one of the foundational works that guided my PhD research."

--- Sujithra Raviselvam



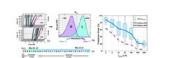
**A 4 GHz Single-to-Differential Cross-Coupled Variable-Gain Transimpedance Amplifier for Optical Communication**  
Electronics

SUTD Author: Samuel B. S. Lee and Kiat Seng Yeo



**AttendAffectNet-Emotion Prediction of Movie Viewers Using Multimodal Fusion with Self-Attention**  
Sensors

SUTD Author: Ha Thi Phuong Thao, B T Balamurali, and Dorien Herremans



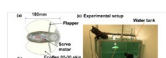
**Computational Failure Analysis of In-Memory RRAM Architecture for Pattern Classification CNN Circuits**  
IEEE Access

SUTD Author: Nagaraj Lakshmana Prabhu and Nagarajan Raghavan



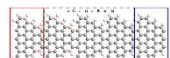
**Deep learning based solder joint defect detection on industrial printed circuit board X-ray images**  
Complex & Intelligent Systems

SUTD Author: Chinthaka Gamanayake, Chau Yuen, and Hirunima Jayasekara



**DNN-Based Predictive Model for a Batoid-Inspired Soft Robot**  
IEEE Robotics and Automation Letters

SUTD Author: Guangtong Li, Thileepan Stalin, Van Tien Truong, and Pablo Valdivia y Alvarado



**Edge Doping Engineering of High-Performance Graphene Nanoribbon Molecular Spintronic Devices**  
Nanomaterials

SUTD Author: Haiqing Wan and Yee Sin Ang



**Ladder Mechanisms of Ion Transport in Prussian Blue Analogues**  
ACS Applied Materials & Interfaces

SUTD Author: Sareh Vafakhah, Lu Guo, and Hui Ying Yang



**Multimodal Mutual Information Maximization: A Novel Approach for Unsupervised Deep Cross-Modal Hashing**  
IEEE Transactions on Neural Networks and Learning Systems

SUTD Author: Tuan Hoang and Ngai-Man Cheung



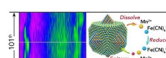
**Payment behavior prediction on shared parking lots with TR-GCN**  
Vldb Journal

SUTD Author: Shuhao Zhang



**Robot-Inclusive False Ceiling Design Guidelines**  
Building

SUTD Author: Matthew S. K. Yeo, S. M. Bhagya P. Samarakoon, Qi Boon Ng, Yi Jin Ng, M. A. Viraj J. Muthugala, Mohan Rajesh Elara



**Topotactic Epitaxy Self-Assembly of Potassium Manganese Hexacyanoferrate Superstructures for Highly Reversible Sodium-Ion Batteries**  
ACS Nano

SUTD Author: Xiaoxia Li, Yang Shang, Dong Yan, Lu Guo, and Hui Ying Yang

"Men love to wonder, and that is the seed of science."

-- Ralph Waldo Emerson

