

August 2019

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.




Professor Chua Chee Kai
Head of Pillar
Engineering Product
Development, Cheng Tsang Man
Chair Professor

CONGRATULATIONS

Professor Chua for publishing the paper
“Print Me An Organ! Why We Are Not
There Yet” in Progress in Polymer Science*.

*Progress in Polymer Science publishes state-of-the-art overview articles by internationally recognized authorities in polymer science and engineering, one of the fastest growing disciplines. In 2018 the impact factor of this journal was 24.5, ranking it the highest in the subject category Polymer Science.






**Associate Professor
Zhao Rong**
Engineering Product Development

CONGRATULATIONS

Associate Professor Zhao Rong for publishing the paper
“Towards artificial general intelligence with hybrid Tianjic
chip architecture”* in Nature.*

*This research presented the world's first cross-paradigm chip that fuses the computer-science-oriented and neuroscience-oriented computing paradigms, and demonstrated a self-driving bicycle using this chip. Its prowess in supporting multiple coding schemes and adaptive capabilities in a complicated environment could move the world a step closer to achieving artificial general intelligence.




**Boron Vacancies
Causing
Breakdown in 2D
Layered Hexagonal
Boron Nitride
Dielectrics**
*IEEE Electron Device
Letters*

SUTD Author: Alok Ranjan, Nagarajan Raghavan, Sen Mei, K. Shubhakar, and Kin Leong Pey

“Hexagonal boron nitride (h-BN) is a promising 2D layered insulator which can seamlessly integrate with graphene and other 2D materials. In this study, we investigate stochastic nature of breakdown in h-BN. We present evidence that points to a non-Weibull distribution for h-BN breakdown and show that boron vacancy defects are the precursors to breakdown”.

--- Alok Ranjan




**Detachable
Acoustophoretic
System for
Fluorescence-
Activated Sorting at
the Single-Droplet
Level**
Analytical Chemistry

SUTD Author: Peixian Li, Zhichao Ma, Yinning Zhou and Ye Ai

“We have developed an acoustic fluorescence activated droplet sorting (FADS) system that can achieve accurate isolation of single cell droplets for high-yield single cell sequencing. This acoustic FADS also enables effective sorting of small particles down to submicron size, which is challenging for existing cell sorting technologies.”

--- Ye Ai

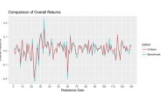


**Gesture and
speech elicitation
for 3D CAD
modeling in
conceptual
design**
*Automation in
Construction*

SUTD Author: Sumbul Khan and Bige Tuncer

“Multimodal interaction techniques offer designers a natural way to create CAD models for conceptual design. We present a compilation of expert-evaluated gestures evaluated suitable for the articulation of CAD modeling referents. We provide recommendations for the design of a gesture and speech based CAD modeling system for conceptual design.”

--- Sumbul Khan




**An inexact l(2)-
norm penalty
method for
cardinality
constrained
portfolio
optimization**
*The Engineering
Economist*

SUTD Author: Tao Jiang, Shuo Wang, Ruo Chen Zhang, Lang Qin, Jinglian Wu, Delin Wang and Selin D. Ahipasaoglu



**Circumventing the no-
go theorem: A single
Weyl point without
surface Fermi arcs**
Physical Review B

SUTD Author: Zhi-Ming Yu, Weikang Wu and Shengyuan A. Yang



**Comprehensive
vibrational dynamics
of half-open fluid-
filled shells**
*Proceedings of the Royal
Society a-Mathematical
Physical and Engineering
Sciences*

SUTD Author: Markus Lendermann, Jin Ming Koh and Kang Hao Cheong



**Forecasting
Hospital Emergency
Department Patient
Volume Using
Internet Search
Data**
IEEE Access

SUTD Author: Jin Ming Koh and Kang Hao Cheong



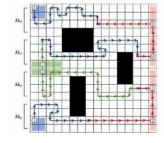
**Generalized High-
Energy Thermionic
Electron Injection at
Graphene Interface**
Physical Review Applied

SUTD Author: Yee Sin Ang, Yueyi Chen, Chuan Tan, and L. K. Ang



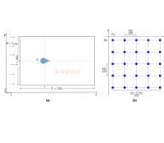
**Generative API
usage code
recommendation
with parameter
concretization**
*Science China-
Information Sciences*

SUTD Author: Jun Sun



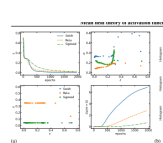
**Graph Theory-
Based Approach to
Accomplish
Complete
Coverage Path
Planning Tasks for
Reconfigurable
Robots**
IEEE Access

SUTD Author: Ku Ping Cheng, Rajesh Elara Mohan and Anh Vu Le



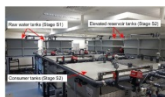
**Hydrodynamic object
identification with
artificial neural models**
Scientific Reports

SUTD Author: Sreetej Lakkam, B. T. Balamurali and Roland Bouffanais



**Mean Field Theory of
Activation Functions
in Deep Neural
Networks**
*International Conference
on Machine Learning
(ICML 2019)*

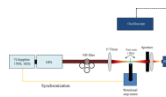
SUTD Author: Thiparat Chotitub



Measuring imperfections of water quality sensors in water distribution networks

Measurement Science and Technology

SUTD Author: Casper de Winter and Venkata Reddy Palleti



Optical nonlinearities in ultra-silicon-rich nitride characterized using z-scan measurements

Scientific Reports

SUTD Author: Byoung-Uk Sohn, Ju Won Choi and Dawn T. H. Tan



Polypyrrole coated niobium disulfide nanowires as high performance electrocatalysts for hydrogen evolution reaction

Nanotechnology

SUTD Author: Xue Gong, Dezhi Kong, Mei Er Pam, Lu Guo, Shuang Fan, Shaozhan Huang, Ye Wang and Hui Ying Yang



Revealing the switching mechanisms of an off-on-off fluorescent logic gate system

Physical Chemistry Chemical Physics

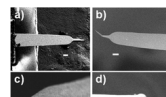
SUTD Author: Weijie Chi, Ying Gao and Xiaogang Liu



Solution of the Crow-Kimura model with a periodically changing (two-season) fitness function

Physical Review E

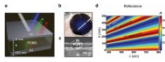
SUTD Author: Kang Hao Cheong



The interplay between drift and electrical measurement in conduction atomic force microscopy

Review of Scientific Instruments

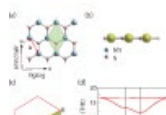
SUTD Author: Alok Ranjan and Kin Leong Pey



Tunable, Cost-Effective, and Scalable Structural Colors for Sensing and Consumer Products

Advanced Optical Materials

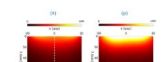
SUTD Author: Joel K. W. Yang



Two-dimensional nodal-loop half-metal in monolayer MnN

Physical Review Materials

SUTD Author: Shan-Shan Wang, Zhi-Ming Yu, Ying Liu, Yalong Jiao, Xian-Lei Sheng and Shengyuan A. Yang



Water-Tunable Highly Sub-Wavelength Spiral Resonator for Magnetic Field Enhancement of MRI Coils at 1.5 T

IEEE Access

SUTD Author: Elizaveta Motovilova, Srikumar Sandeep, Michinao Hashimoto and Shao Ying Huang

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