April 2023

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.



Identifying threats, cybercrime and digital forensic opportunities in Smart City Infrastructure via threat modelling Forensic Science International: Digital Investigation

SUTD Author: Yee Ching Tok, Sudipta Chattopadhyay

"Modern infrastructure like smart cities entice adversaries to commit criminal acts. Varied understanding of smart city infrastructure (SCI) and heavy workloads complicate cybercrime investigation. We propose a common definition of SCI, map offences, evidence and identified threats to assist investigators, and make publicly available a threat model template for adoption."

--- Yee Ching Tok



The fluorescence quenching mechanism of tetrazine-functionalized fluorogenic labels with integrated π-conjugations: internal conversion to a dark state

Materials Chemistry

SUTD Author: Shen Tianruo, Yadav Priya, Liu Xiaogang

"Through quantum chemical calculations, we formalized a fluorescence quenching mechanism - internal conversion to a dark state (ICDS) to rationalize the fluorogenicity of tetrazine-functionalized labels with integrated π-conjugations. Based on the understanding of structure-property relationship, we further proposed several design strategies for developing high-performance tetrazine-fused fluorogenic labels with redshifted emission wavelengths and enhanced fluorescence turn-on ratios."

--- Liu Xiaogang



Gap solitons on an integrated CMOS chip Nanophotonics

SUTD Author: Choi, Ju Won; Sohn, Byoung-Uk; Sahin, Ezgi; Chen, George F. R.; Xing, Peng; Tan, Dawn T. H.

"We explore the gap solitons in a highquality on-chip CMOS-compatible Bragg grating, enabling the observation of tunable slow light and temporal soliton compression. Our work showcases a new on-chip slow light configuration for optical delay lines and true optical storage, providing a new pathway for the tailored storage for light sources."

--- Choi Juwon



A Computational Approach to Identifying Engineering Design Problems

Journal of Mechanical Design

SUTD Author: Silva, Arlindo



A metaheuristic approach to optimal morphology in reconfigurable tiling robots

Complex & Intelligent Systems

SUTD Author: Kalimuthu, Manivannan; Pathmakumar, Thejus; Hayat, Abdullah Aamir; Elara, Mohan Rajesh



Alzheimer's
Dementia Speech
(Audio vs. Text):
Multi-Modal
Machine Learning at
High vs. Low
Resolution

Applied Sciences-Basel

SUTD Author: Liu, Huiying; Yang, Shengyuan



Effect of swarm density on collective tracking performance

Swarm Intelligence

SUTD Author: Kwa, Hian Lee



Efficacy of noisy dynamical decoupling

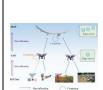
Physical Review A

SUTD Author: Xu, Xiansong; Poletti, Dario



Efficient Synthesis of 2D Mica Nanosheets by Solvothermal and Microwave-Assisted Techniques for CO2 Capture Applications Materials

SUTD Author: Weerasinghe, P. Vishakha T.; Wu, Shunnian; Lee, W. P. Cathie; Anariba, Franklin; Wu, Ping



Hierarchical Aerial Computing for Internet of Things via Cooperation of HAPs and UAVs

IEEE Internet of Things

Journal

SUTD Author: Yuen, Chau



Human Action Recognition From Various Data Modalities: A Review

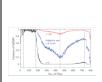
IEEE Transactions on Pattern Analysis and Machine Intelligence

SUTD Author: Sun, Zehua; Liu, Jun



Inverse design in quantum nanophotonics: combining localdensity-of-states and deep learning Nanophotonics

SUTD Author: Zhou, Wen-Jie; Wu, Lin



Multiscale Sparsity
Measure Fusion for
Bearing
Performance
Degradation
Assessment
IEEE TRANSACTIONS ON
PARALLEL AND

DISTRIBUTED SYSTEMS

SUTD Author: Xiong, Zehui



Plasmons in a twodimensional nonsymmorphic nodal-line semimetal Physical Review B

SUTD Author: Cao, Jin; Feng, Xiaolong; Yang, Shengyuan A.

Thysical Neview B

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Intercept times
Majors areneg as entirely but significant human-volot interactions in the sign

Robots among us: ordinary but significant humanrobot interactions in the city

Al & Society

SUTD Author: Chan, Jeffrey Kok Hui; Wang, Yixiao