

In the spotlight



Fair Concurrent Training of Multiple Models in Federated Learning

IEEE Transactions on Networking

SUTD Author: Marie Siew

Federated Learning (FL) enables decentralized model training across devices/clients without sharing raw data. While most FL systems focus on a single learning task, emerging applications increasingly require Multiple-Model Federated Learning (MMFL)—training multiple tasks concurrently. Existing MMFL approaches typically assign clients to tasks uniformly or randomly, which can lead to unfair performance, especially when task difficulties vary or clients are selective about which tasks they are willing to train.

To address this, we propose FedFairMMFL, a dynamic, difficulty-aware client-task allocation algorithm that adjusts assignments based on current task performance, ensuring underperforming or harder tasks receive more attention. We also design auction-based incentive mechanisms that incentivize clients to participate in multiple tasks. The proposed approach is theoretically grounded, with fairness and convergence guarantees, and empirically shown to improve the performance and convergence of low-performing tasks while maintaining average accuracy.



"The proposed approach is theoretically grounded, with fairness and convergence guarantees, and empirically shown to improve the performance and convergence of low-performing tasks while maintaining average accuracy"

- Marie Siew

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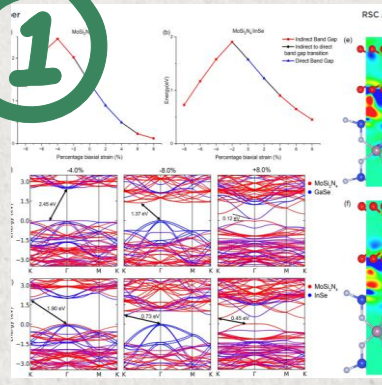
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RSC Applied Interfaces

SUTD Authors: Ng Jin Quan, Wu Qingyun, Ang Yee Sin, Ang, L. K.

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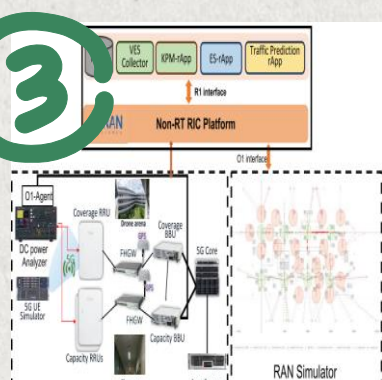
Adaptive Outdoor Cleaning Robot with Real-Time Terrain Perception and Fuzzy Control

Mathematics

SUTD Authors: Raul Fernando Garcia Azcarate Akhil, Aung Kyaw Jayadeep Zin, James Lee Wei Shung, M. A. Viraj J. Muthugala, Mohan Rajesh Elara

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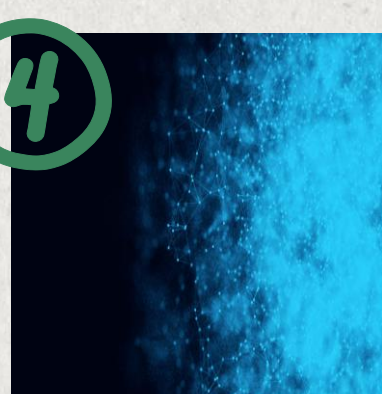
Digital Twins Meet Open RAN: Case Studies, Implementation, and Opportunities

IEEE Communications Magazine

SUTD Author: Zhou Longyu, Chen Binbin, Ngo Mao V., Tony Quek Q. S.

ISTD, Future Communications Research & Development Programme

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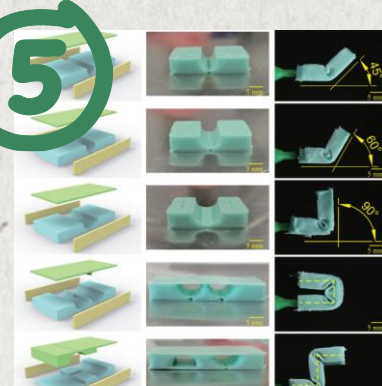
Deep Complex-valued Convolutional Learning for Waveform OFDM Receiver Design

2025 IEEE Wireless Communications And Networking Conference,

SUTD Author: Ji Jiequ, Nam Phuong Tran, Xiong Zehui, Tony Quek Q. S.

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Architected Vacuum Driven Origami Structures via Direct Ink Writing of RTV Silicone

IEEE Robotics And Automation Letters

SUTD Author: Wang Qiyao, Stalin Thillepan, Pablo Valdivia

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Performing Ephemerality and the Daily Production of the Fleeting City

Journal Of International Migration And Integration

SUTD Authors: Rafael Martinez

LKYCIC

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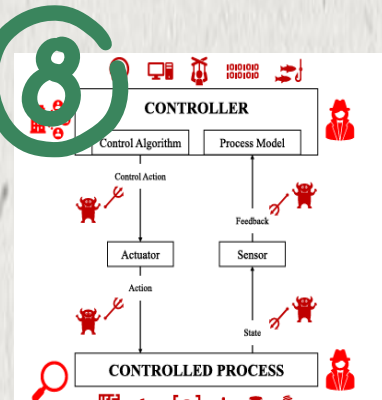
Forecasting Bitcoin Volatility Spikes From Whale Transactions and CryptoQuant Data Using Synthesizer Transformer Models

IEEE Access

SUTD Authors: Dorien Herremans, Low Kah Wee

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STPA-Cyber: A semi-automated cyber risk assessment framework for maritime cybersecurity

Computers & Security

SUTD Authors: Awais Yousaf, Sean Gunawan, Zhou Jianying

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