In the spotlight

Reading Users' Minds With Large Language Models: Mental Inference for Artificial Empathy in Design

Journal of Mechanical Design

SUTD Author: Zhu Qihao

Understanding users' underlying motivations and needs is crucial for design innovation, but existing methods face a trade-off between depth and scale. Traditional natural language processing (NLP) approaches struggle to "read between the lines" and infer meaningful insights, while conventional user research is difficult to scale beyond small focus groups. This study investigates whether large language models (LLMs) can "read minds" by inferring users' goals and psychological needs (e.g., comfort, security) from their comments. We conducted a human-subject study to benchmark AI models against human designers on user mind-reading tasks.

The results show that advanced models (GPT-4) match human designers in accuracy — even approaching expert performance — in uncovering what users truly want. These findings suggest that AI can augment designers in efficiently empathizing with large user bases, enabling scalable, yet deeply human-centered, design processes.

"AI can augment designers in efficiently empathizing with large user bases, enabling scalable, yet deeply human-centered, design processes.."
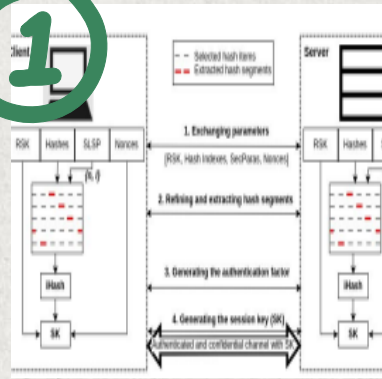
- Zhu Qihao

Deep Dives : made digestible by experts

Annual Reviews offers peer-reviewed, expert-written summaries across 40+ disciplines in science and social science. Ideal for literature reviews, thesis prep, or exploring new topics—get trusted insights without sifting through hundreds of research articles.
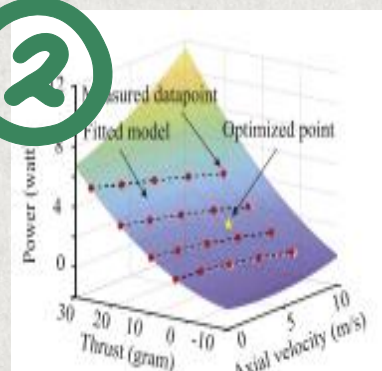
TRAILBLAZERS

①

MFAA: Historical Hash Based Multi-Factor Authentication and Authorization in IIoT
2024 Annual Computer Security Applications Conference Workshops
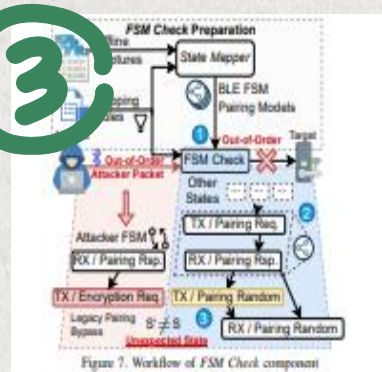SUTD Authors: Eyasu Getahun Chekole, Zhou Jianying
ISTD

②

Design and Optimization of a Samara-Inspired Lightweight Monocopter for Extended Endurance
IEEE Robotics And Automation Letters
SUTD Authors: Cai Xinyu, Tan Tee Meng, Ang Wei Jun, Foong Shaohui
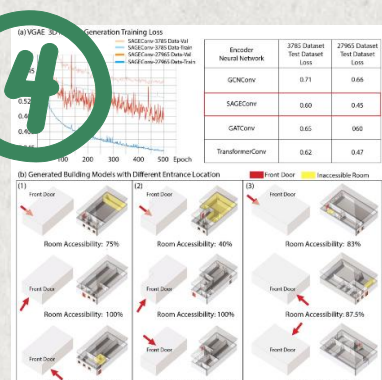*EPD*

③

VaktBLE: A Benevolent Man-in-the-Middle Bridge to Guard against Malevolent BLE Connections
2024 Annual Computer Security Applications Conference
SUTD Authors: Geovani Benita, Leonardo Sestrem, Matheus E. Garbelini, Sudipta Chattopadhyay
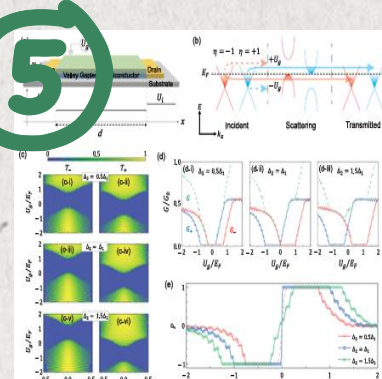*ISTD*

④

Building-graph-AI: Graph neural networks learning and generating 3D detailed and layered building models
International Journal Of Architectural Computing
SUTD Author: Immanuel Koh
ASD

⑤

Valley gapless semiconductor: Models and applications
Physical Review B
SUTD Authors: Lee Kok Wai, Fu Pei-Hao, Ang Yee Sin
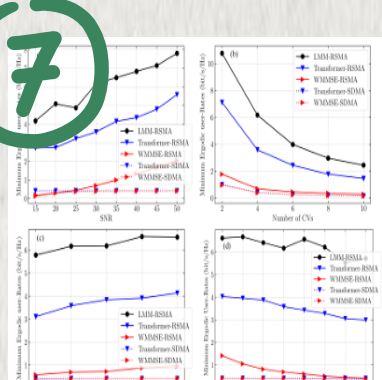*SMT*

⑥

An Optical Flow- and Machine Learning-Based Fall Recognition Model for Stair Accessing Service Robots
Mathematics
SUTD Authors: Ong Jun Hua, Elara Mohan Rajesh
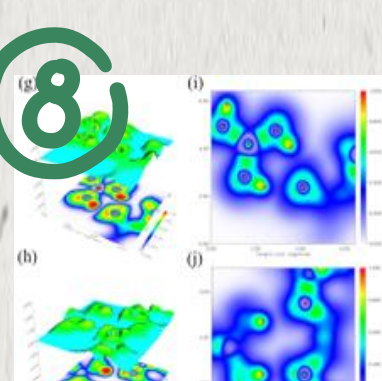*ROAR Lab, EPD*

⑦

Personalizing rate-splitting in vehicular communication via large multi-modal model
Science China-Information Sciences
SUTD Authors: Zhang Shengyu, Tony Q. S Quek
ISTD

⑧

Efficient boron removal from activated carbon-nitrogen-doped graphene oxide
Desalination
SUTD Authors: Yao Jingjing, Yang Hui Ying
EPD