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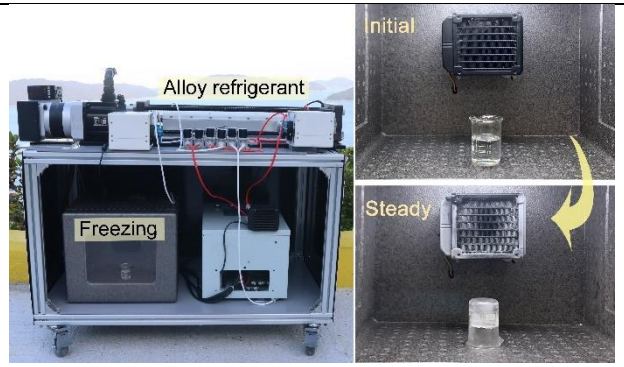
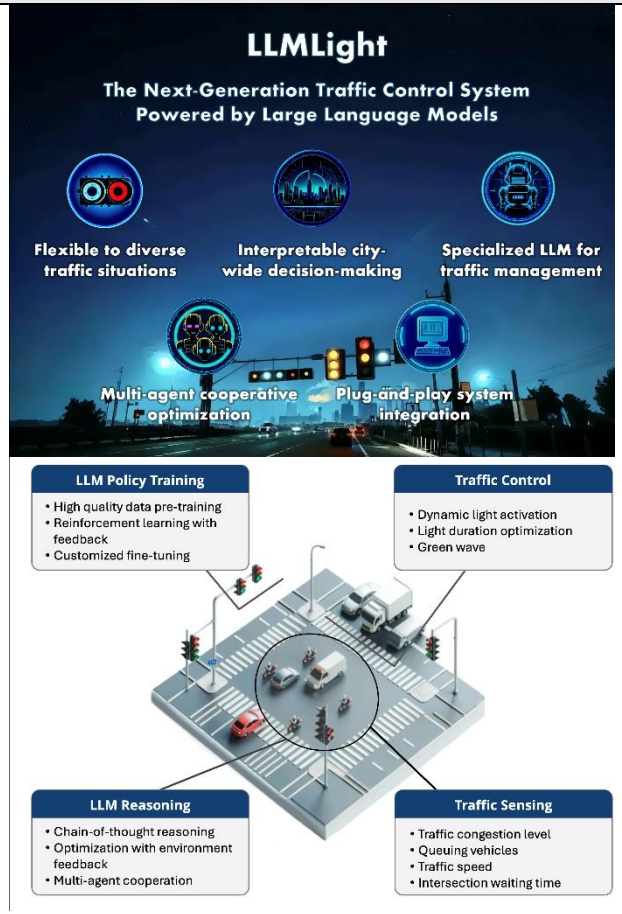
Invention / Project	Description	Key technology edges	Images
Special Prizes			
Greenhouse-gas-free Elastocaloric Freezing	Using recyclable and greenhouse-gas-free shape memory alloys, the team built a solid-state sub-zero Celsius freezer to replace vapor-compression-based commercial refrigerators.	• Green freezing device without HFC/CHFC gas refrigerants. • From room temperature down to -12 (261 K) • About 650 million tonnes CO2 equivalence can be reduced globally per year if the technology was adopted worldwide	

Invention / Project	Description	Key technology edges	Images
LLMLight: An LLM-Empowered Autonomous Agent for Traffic Signal Control	An AI-based traffic signal control system using Large Language Models (LLMs) for human-like decision-making, integrating real-time traffic data and knowledge-rich prompts to optimize urban traffic flow.	• Specialized LLM for traffic management: Fine-tuned for traffic patterns and domain knowledge, LLMLight delivers context-aware, interpretable signal control strategies. • Multi-agent cooperative optimization: LLMLight coordinates LLM agents managing multiple intersections for synchronized, city-wide traffic management, minimizing congestion and optimizing flow. • Plug-and-play system integration: LLMLight integrates seamlessly with existing infrastructure, enabling rapid deployment in diverse urban contexts.	

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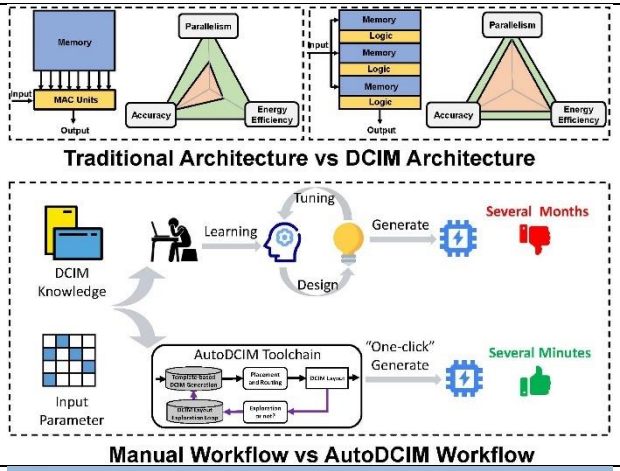
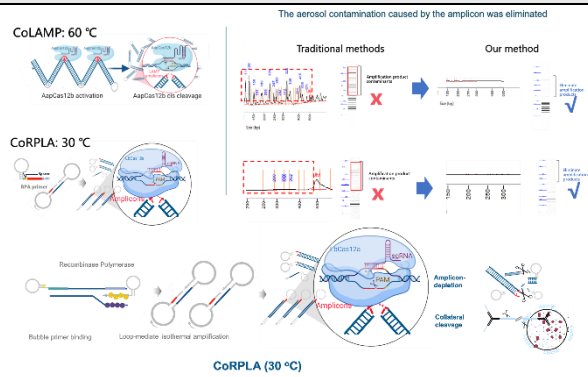
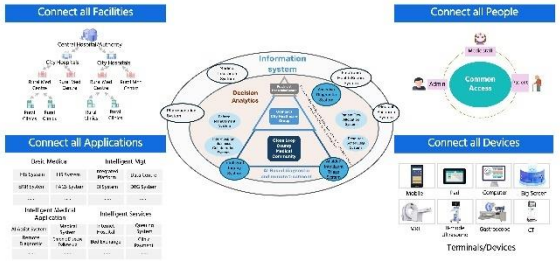
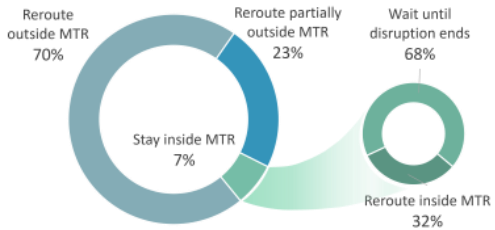
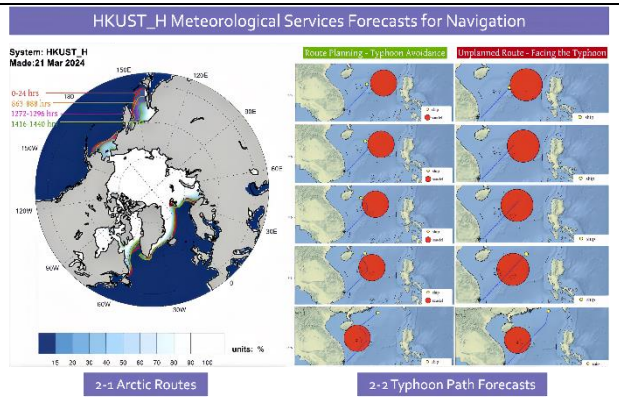
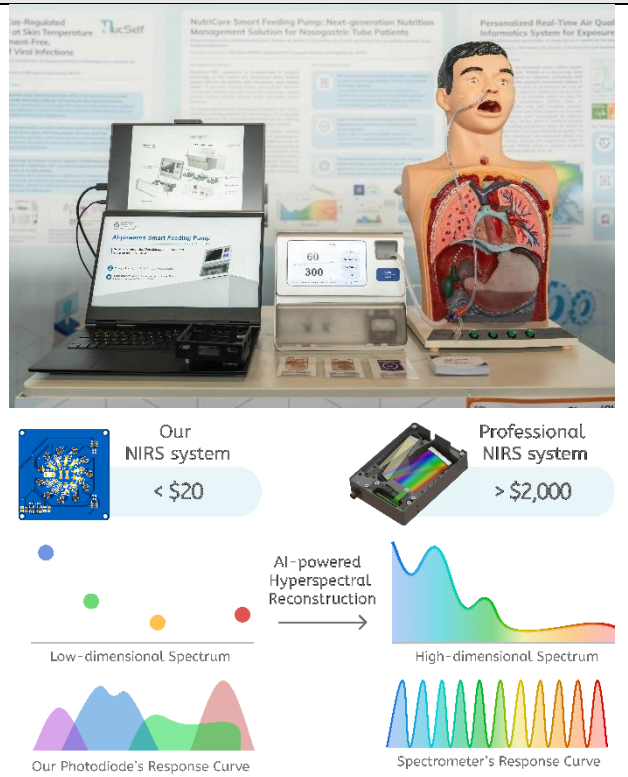
Invention / Project	Description	Key technology edges	Images
Gold Medals with Congratulations of the Jury			
Digital Compute-In-Memory (DCIM) Enabled Portable Genome Analysis Prototype	Digital Compute-In-Memory (DCIM) merges memory and computing logic, revolutionizing AI chips with remarkable efficiency. AutoDCIM, the first EDA tool for DCIM design, enables DCIM-based solution demonstrated with a portable genome analysis prototype.	• The first automated DCIM chip generation tool for specific applications, AutoDCIM. • The first Transformer-based finding consensus DNA software architecture. • The first DCIM-based finding consensus DNA prototype, which provides 5.61x and 301.6x throughput speedup and energy saving than NVIDIA Jetson.	
Methods of Preparing Inorganic Matrices for Dosing Dissolvable Sodium Chlorite for Controlling Algal Growth in Water	A groundbreaking approach to managing microalgae and pathogens in water involves the use of a multi-functional algicidal and bactericidal delivery system with controlled and sustained release features.	• Multi-functional delivery system for long-acting water treatment. • Enhance water quality by eliminating harmful microbes and algae. • No heavy metal and no antibiotics	

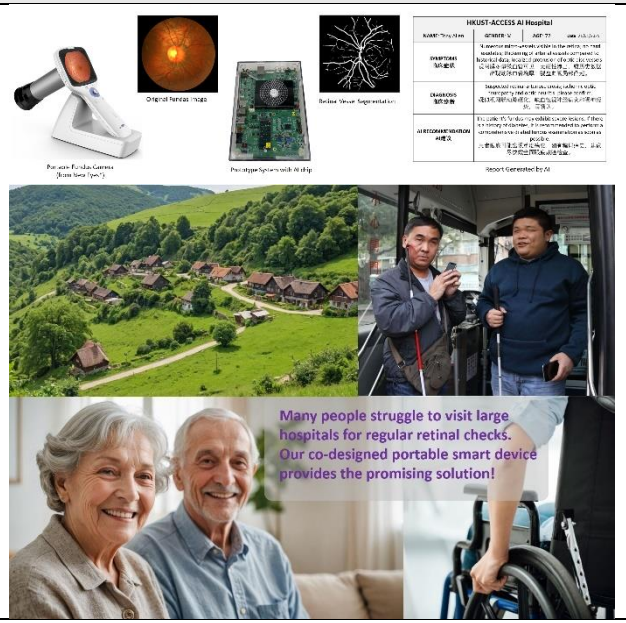
Invention / Project	Description	Key technology edges	Images
			
BioTherm+: Biochar Thermal-Insulating Plaster for Comfortable and Eco-Friendly Living	BioTherm+ is an eco-friendly biochar-based thermal-insulating plaster to provide comfortable, energy-saving, and sustainable living environment for green buildings.	• BioTherm+ enhances insulation efficiency by 30-50%, reducing heat transfer and maintaining stable indoor temperatures, leading to lower energy consumption and improved thermal comfort in buildings. • By reducing heating and cooling demands, BioTherm+ lowers energy costs, making buildings more sustainable and cost-effective over their lifespan. • BioTherm+ reduces the carbon footprint of buildings while promoting environmentally responsible construction practices using biochar technology.	

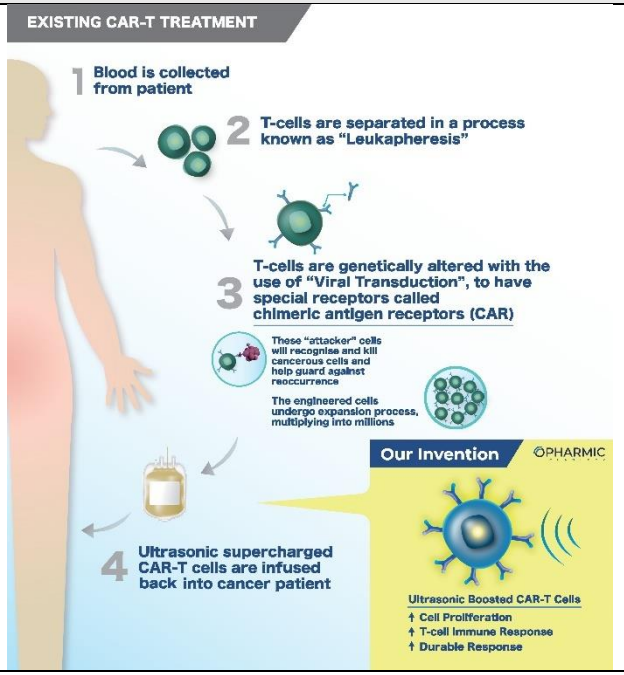
Invention / Project	Description	Key technology edges	Images
Amplicon-Depleted Crispr/Cas-Regulated Isothermal Molecular Assay At Skin Temperature Enabling Multi-Level, Equipment-Free, Home-Based Self-Testing Of Viral Infections	Break DNA home-testing barrier of contamination. Our patent is paper-based self-cleaning high-accuracy viral load detection. 2-min at-home operation, no power supply.	• Business value: Skin-temp prototype offers a low-cost solution to enable reliable daily home molecular self-testing for daily infectious diseases. • Technical novelty: our patent eliminates amplicon aerosol contamination that blocks home nucleic acid testing despite accuracy within lab. • Technology description: Amplicon-depleted CRISPR-based loop-mediated isothermal amplification with recombinase polymerase removes contamination barriers in non-lab settings.	
Regional Integrated Healthcare Operation System (RIHOS)	RIHOS is an AI-powered medical solution that modernizes healthcare from hospitals to rural clinics, ensuring equitable access to services. It addresses data fragmentation and resource allocation challenges, fostering integrated healthcare.	• Medical Information Technology: leveraging technologies like big data, cloud computing to strengthen medical informatization, improve data management. • Decision support tools: integrating AI-based decision analytics, including machine learning and optimization, to address the resource allocation challenges. • Collaborative Healthcare Communities: using the IOT and AI to construct a new patient service that combines online and offline to form an integrated ecosystem.	

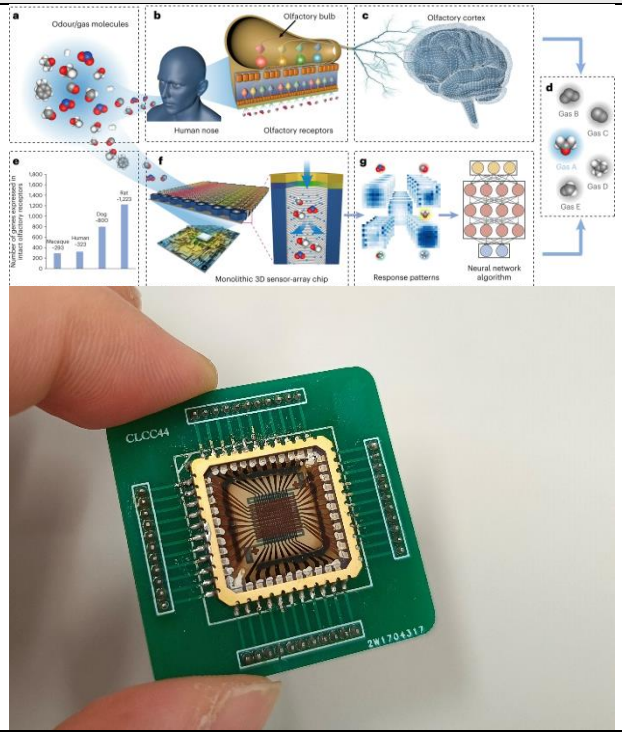
Invention / Project	Description	Key technology edges	Images
Metro Maestro - A configurable route map that dynamically forecast ridership for metro operator, transport planners and commuters	A near real-time prediction and simulation model of passenger flow patterns under urban metro rail service disruptions. Easily configurable to the disruption scenario at hand, assist metro railway operators to allocate management resources as service disruptions emerge. Machine learned passenger behaviour using anonymized MTR ticketing data from past disruptions. The prediction of passenger flow patterns is disassembled to a passenger route choice model, origin-destination diversion estimation and a microscopic metro system simulation.	• Machine learned passenger disruption behaviours from past disruption events. Anonymized passenger ticketing gate entry-exit time from HK MTR were used to capture exact diverted routes in the MTR system. • Four categories of passenger behaviour during a disruption: leave the metro entirely, return to metro at another station, reroute within the metro system, wait in place until the disruption resolves. • Dynamically predicts the disruption route choices in new episodes of metro disruption, metro travel is compared against historical travel time of alternative travel modes outside the metro network.	 

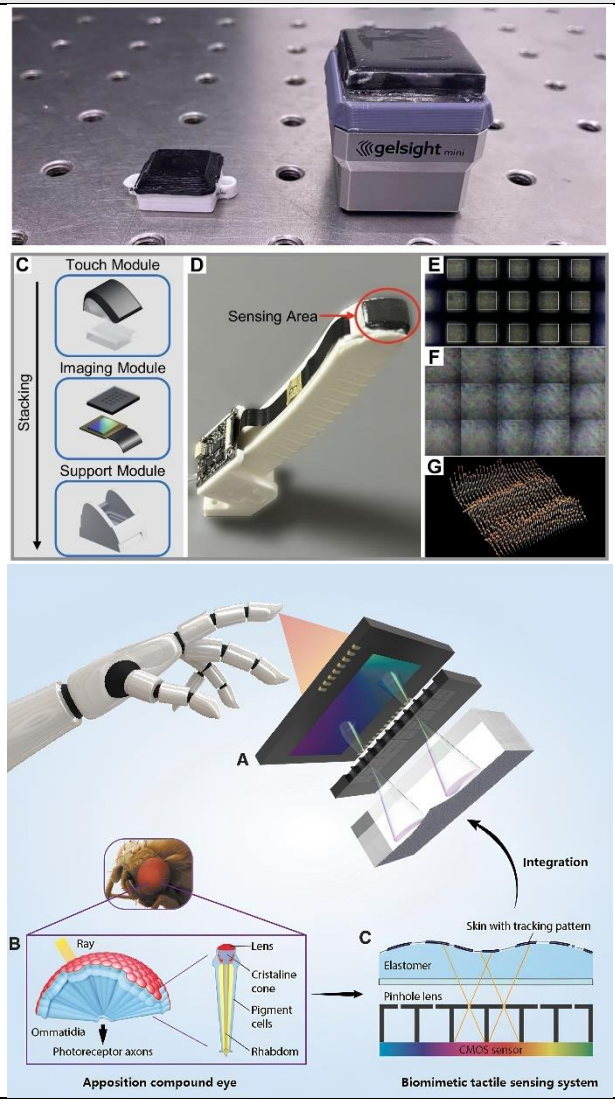
Invention / Project	Description	Key technology edges	Images
Other Winning Inventions and Entries			
meteoNEX Seamless Weather-to-Climate Prediction Services	meteoNEX leverages AI and world-class HKUST_H/L model to revolutionize weather and sub-seasonal prediction services. Catering to critical sectors, our core technology delivers unparalleled information for optimal decision-making.	• Proprietary HKUST-H/L model integrates AI for precise, high-fidelity, seamless climate predictions. • Continuous updates and online platform ensure real-time accuracy and accessibility. • Tailored services: meteoNEX delivers sector-specific predictions to streamline decision-making processes.	

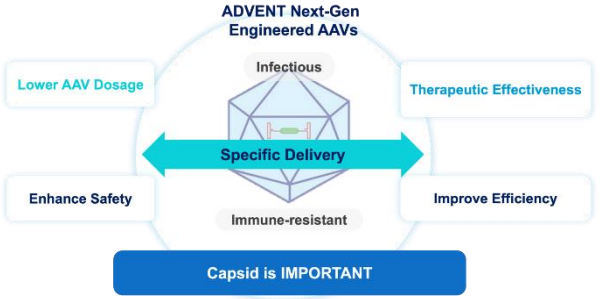
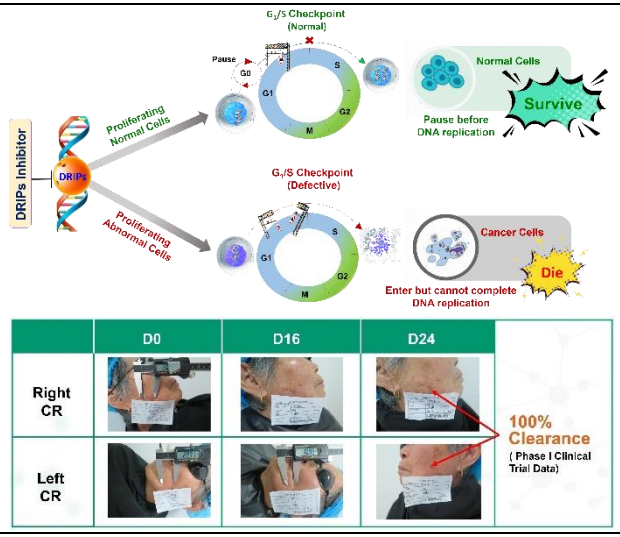
Invention / Project	Description	Key technology edges	Images
NutriCare Smart Feeding Pump Next-generation Nutrition Management Solution for Nasogastric Tube Patients	NutriCare-YS01 Feeding Pump is tailored for patients with nasogastric feeding needs, providing gastric residue analysis, nutritional intake monitoring, recipe recommendation, and auto-feeding control, enhancing care efficiency and patient outcomes.	• The world's first smart feeding pump with a closed-loop of gastric suction, auto-feeding, nutrition data analysis, and recipe adjusting. • Liquid component analysis based on multi-band hyperspectral reconstruction using deep learning neural networks. • Personalized AI dietitian powered by large language model technology and multiple AI agents.	

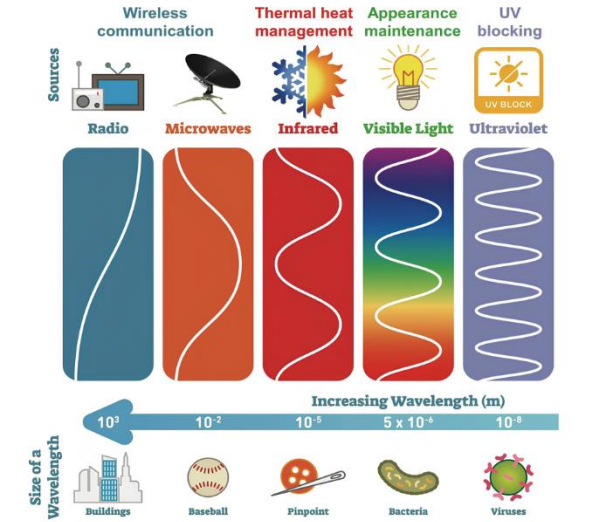
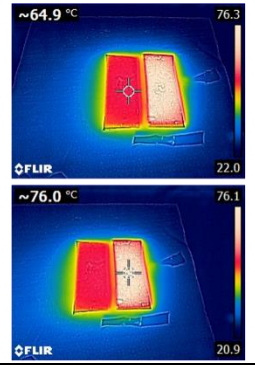
Invention / Project	Description	Key technology edges	Images
Ultra-high Energy Efficiency AI Accelerator for Portable Healthcare Devices	A prototype for real-time, accurate clinical image segmentation, specifically tailored for a portable healthcare device. It harnesses our CNN-Transformer AI accelerator, delivering a 10x energy efficiency enhancement over conventional digital chips.	• Co-designing application algorithms with AI chip architecture boosts energy efficiency by 7x over edge-side GPUs, reducing development cycles by 50%. • Innovative AI chip architecture cuts off-chip memory access by over 80%, offering nearly 10x energy efficiency compared to similar chips. • Enhanced hardware prototype system, coupled with a mature proprietary software toolchain, reduces system integration and application deployment costs by 70%.	

Invention / Project	Description	Key technology edges	Images
Non-contact Ultrasound Cell Priming Technology for CAR-T Therapy Optimisation	Patented novel ultrasound cell priming technology with working prototype targeted to enhance treatment efficiency and efficacy of CAR-T therapy by physical T cells stimulation, offering better clinical and survival outcomes for blood cancer patients.	• Enhance CAR-T treatment outcomes ó (1) Deliver better treatment response rate & survival outcomes, & (2) Prolong treatment effects & reduce relapse rate. • Extend CAR-T treatment accessibility ó (1) Shift CAR-T to early lines of treatment & (2) Maximize CAR-T production yields & reduce treatment cost. • Expand CAR-T treatment applications ó (1) Escalate CAR-T application to solid tumors, & (2) Broaden CAR-T application to other disease areas (e.g. diabetes).	

Invention / Project	Description	Key technology edges	Images
Biomimetic Olfactory Chips (e-nose)	A Sensor Array features high-density vertical MOX nanotubes with 3D nanostructures and diverse pixels, with signal circuits and neural networks. It mimics biological olfactory receptors with 100ó10,000 sensors for advanced sensing capabilities.	• High sensitivity toward ppb-level gas molecular concentration varying sensor numbers from 100 to 10,000. • High recognition capability and fast response time to numerous types of gas/odors. • Exquisite Manufacturing Processes - Atomic Layer Deposition (ALD) and Subsequent Suspension Mask Assisted Sputtering (SMAS)	

Invention / Project	Description	Key technology edges	Images
Haptic Sensors for Future Human-Robot Interaction	Our invention revolutionizes human-robot interaction by seamlessly integrating ultrathin tactile sensor for dexterous manipulation and high-performance, cost-effective haptic sensor skin for humanoid robots. Embedded AI for more intelligence.	• A full body, flexible haptic sensor skin for humanoid robots with low cost and high performance. • Fusion of vision, barometer, and haptic sensors for full-scale effective human-robot interaction and cooperation. • Robust tactile sensors for manipulation enhance dexterous to achieve "flip paper like human".	

Invention / Project	Description	Key technology edges	Images
AI-Driven Vector Engineering for Gene Therapy	The team use an AI foundational model to design novel AAV capsids, enhancing gene therapy by improving tissue and cell specificity, increasing delivery efficiency, and reducing off-target effects, making targeted treatments more effective and accessible.	• Foundational model (100B) built from evolutionary databases in human proteins & virome. • Experimental screenings in multiple animal species. • Positively and negatively enriched capsids of desired characteristics. • Novel capsids designed with shorter production time, higher specificity, and lower costs.	
Establishment of DNA Replication-initiation Proteins (DRIPs) as Novel Anticancer Targets and Development of First-in-class Broad-spectrum and Highly Efficacious Anticancer Drug Candidates Targeting DRIPs	Established DNA replication-initiation proteins (DRIPs) as novel anticancer targets and identified DRIP inhibitors as potent broad-spectrum anticancer drug candidates without harm to normal cells; one is safe and effective in phases I-II clinical trial.	• Broad-spectrum, highly efficacious anticancer drug candidates targeting DNA replication-initiation proteins (DRIPs), with low toxicity towards normal cells. • Our EN002 leads to significant tumor remission (over 90%) in mouse xenograft models. This efficacy surpasses that of most current anticancer drugs. • EN002-gel is safe and effective, as demonstrated in phase I clinical trial (CN & AU) in skin cancer and precancerous lesions; phase II clinical trial is ongoing.	

Invention / Project	Description	Key technology edges	Images
Optimizing Vehicle Cooling Systems: Energy-Saving Strategies for Efficiency enhancements via ultra-band spectrum manipulation	Our invention addresses EV thermal comfort, reducing A/C energy usage. It employs low-emissivity film for heat blockage and RF transparency, with a color-adaptive skin to reflect solar energy, enhancing radiative cooling and energy efficiency in EVs.	• Low-Emissivity Window Films: Minimize solar heat gain while maintaining RF transparency, reducing air conditioning loads. • Color-Adaptive Car Skin: Reflects solar radiation to enhance surface cooling and improve passenger comfort. • Spectral Control Technology: Available in transparent and opaque formats for versatile thermal regulation in the automotive industry.	  

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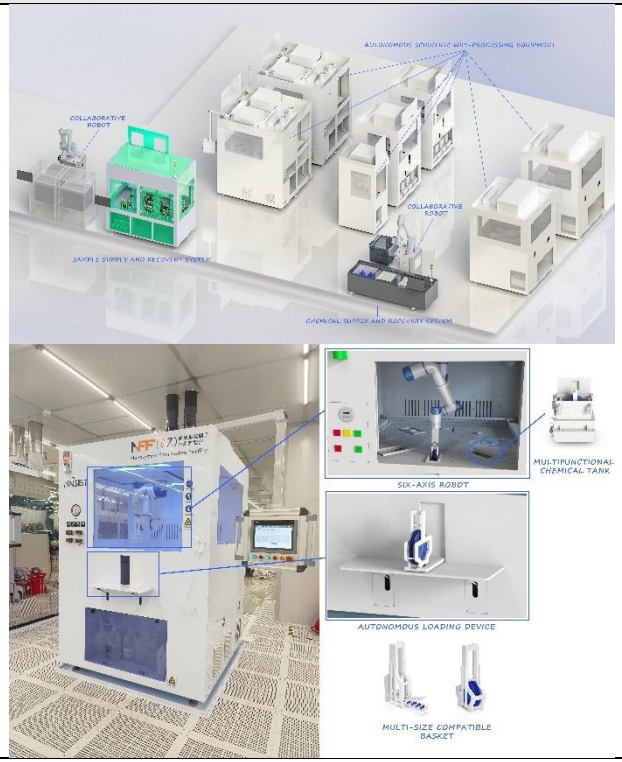
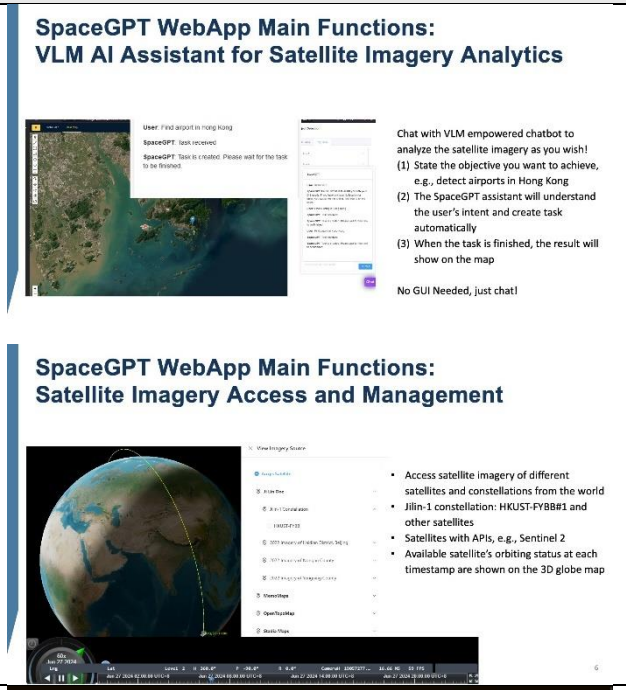
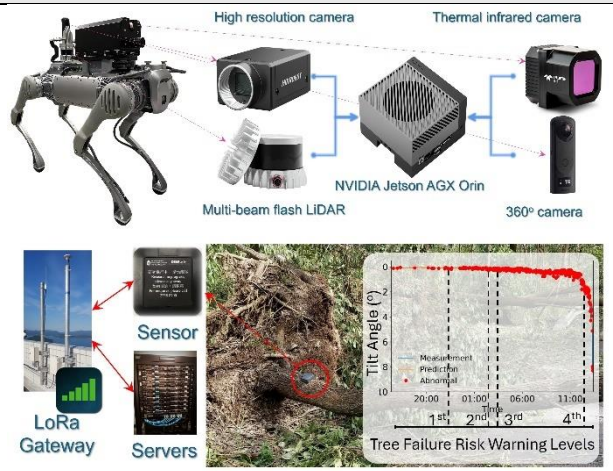
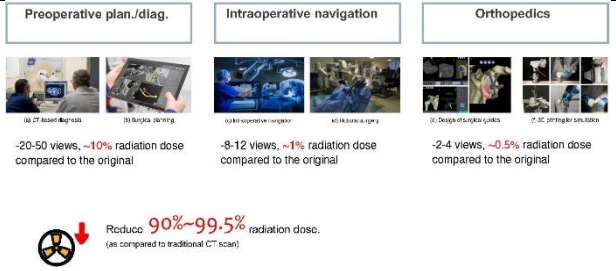
Invention / Project	Description	Key technology edges	Images
Autonomous Nanofabrication Wet-Processing îDARK LAB of the FUTUREï System	It provides a fully automated wet etching platform for micro-nano devices, reducing chemical use and enhancing compatibility. With a transfer robot and intelligent scheduling, it enables 24/7 unattended operation, improving efficiency and safety.	• Robotic automated wet-processing equipment designed for precise scientific experimental tasks, reducing manual labor and hazards. • Collaborative robots facilitate sample transfer and chemical supply changes, enhancing efficiency and safety in laboratory operations. • Central data management system enables continuous, unattended experimentation, transforming traditional labs into automated discovery factories.	

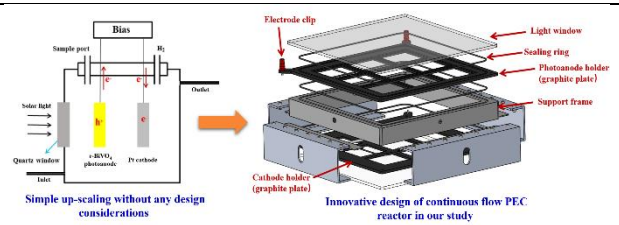
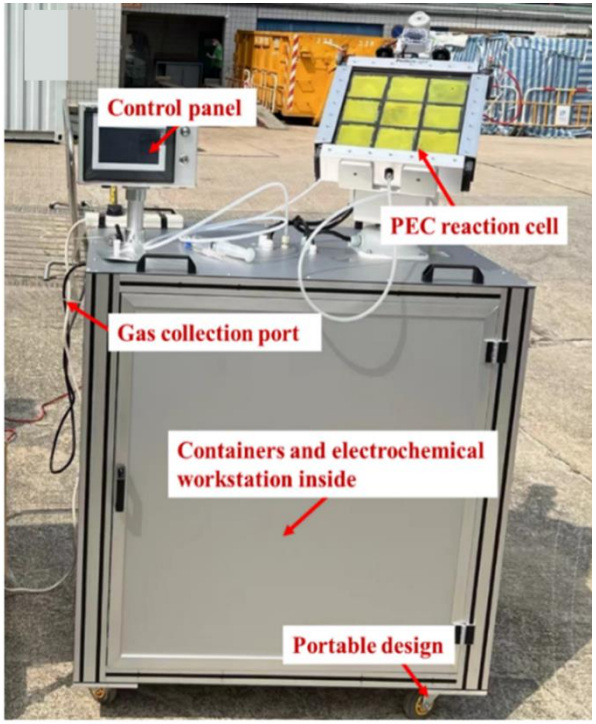
Invention / Project	Description	Key technology edges	Images
Jacobi.ai JSR-1 Service Robot	JSR service robots integrate our multimodal AI and cross-embodiment motion control technologies for zero-shot spatial and instance cognition, and generalist open skills and manipulation, applied in scenarios like retail, restaurant and home services.	• Zero-shot open-world scenes understanding, reasoning and generalist skills adaptation facilitating out-of-the-box deployment. • LVLM-driven zero-shot recognition of all merchandises without need for specific data collection, labeling or training. • Hybrid 3D object structure and material physical property reconstruction for material-sensitive manipulation and real2sim deformable dynamics simulation.	

Invention / Project	Description	Key technology edges	Images
Home Opera House	Experience opera house acoustics at home with Home Opera House. Our revolutionary metamaterial technology creates a boundless soundscape in limited space. Tailor the acoustics to your tastes. Crafted from recycled plastics, embrace sustainability.	• Precision Acoustic Control: Acoustic metamaterial enables precisely controllable acoustic properties. • Environmental Sustainability: Crafted from recycled plastic, our technology prioritizes sustainability for a greener future. • Boundless soundscape in any limited space, our technology transforms listening environments and Hi-Fi devices.	

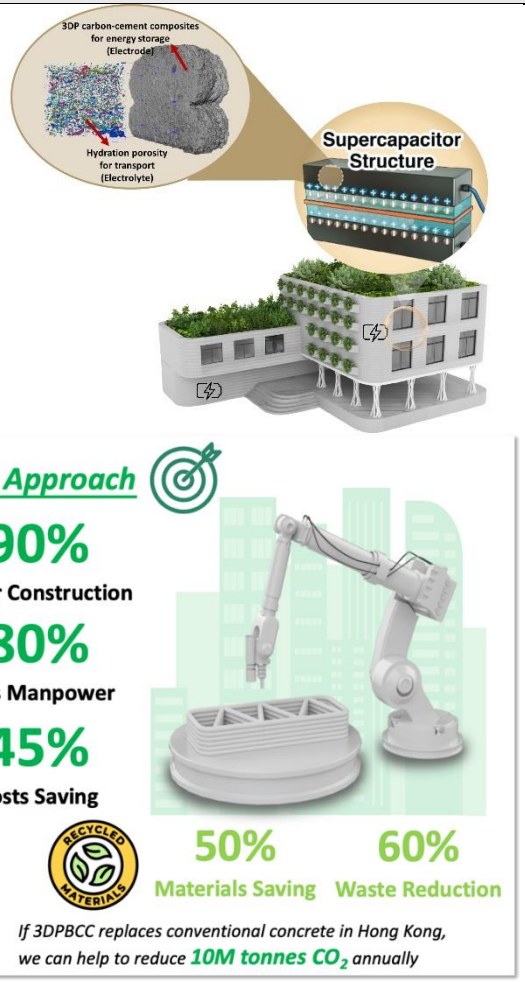
Invention / Project	Description	Key technology edges	Images
SpaceGPT: Vision Language Model (VLM) Empowered Remote Sensing Satellite Data Service Platform	This invention presents a spatial intelligence platform that utilizes vision language model fine-tuned on remote sensing imagery dataset to enable users to extract useful insights in remote sensing satellite data by natural language query.	• Vision Language AI Model fine-tuned for remote sensing satellite imagery enables multi-modal query by text • Zero-shot Inference generalization on remote sensing satellite imagery ensures varsatility on multiple tasks. • Integration of multiple satellite data sources in WebApp increases spatial and temporal coverage	
Biosphere3: Open-Ended Agent Sandbox for Autonomous AI Evolution and Evaluation	Open-ended lifelong learning virtual embodied agents using multi-agent economic simulations. These agents enhance game decision systems, improve economy design, and simulate realistic interactions, bridging virtual and real-world applications.	• Real-Time Autonomous Agent Evolution: Supports dynamic multi-agent interaction and self-improvement in a scalable, sandbox environment. • Versatile Agent Framework: Modular design for deploying agents across virtual and real-world applications with minimal setup. • Cost-Effective AI Evaluation: Reduces traditional AI testing costs through scalable virtual simulations and long-term agent performance monitoring.	

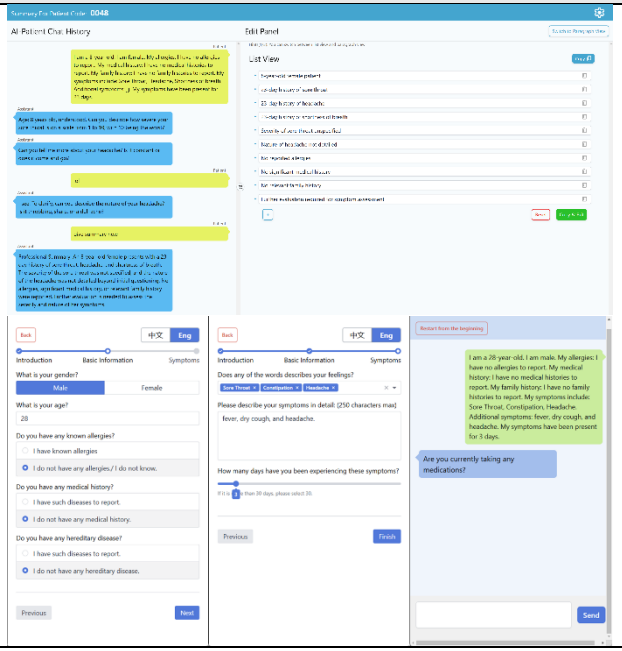
Invention / Project	Description	Key technology edges	Images
TreeBotX **A Human-Robot-AI Symbiotic Solution for Intelligent Urban Forestry**	TreeBotX revolutionizes urban tree management by integrating three cutting-edge frameworks of AI, robotics, and human expertise enhances accuracy, reduces subjectivity in risk assessments, and lowers labor demands, paving the way for safer, smarter, and greener urban landscapes.	• Automate urban tree inventory and assessment using a quadruped robot with advanced mobile mapping and AI-driven data processing. • Enable continuous and long-term tree tilt monitoring through an energy-efficient LoRaWAN-based IoT system, leveraging AI for anomaly detection and pre-emptive tree failure warnings. • Incorporate domain expertise with Multimodal LLMs to deliver holistic, automated, and data-driven assessments of tree health and stability.	

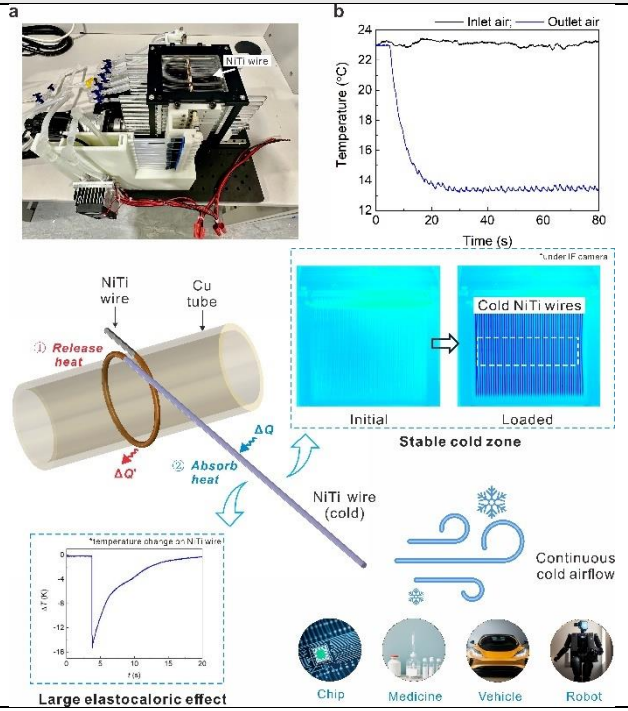
Invention / Project	Description	Key technology edges	Images
Smart Fish for Rapid Detection of Multiple Types of Microplastics in the Ocean	A smart prototype designed for real-time sampling and detection of microplastics and tire wear particles in coastal waters. Using specific dyes, it autonomously identifies contaminants accurately and mitigates microplastic pollution effectively.	• Offers rapid and accurate on-site detection and characterization of microplastics and vehicle tire wear particles in environment. • Differentiates different plastic types and vehicle tire wear particles using composite dyes	
C2RV: Cross-Regional and Cross-View Learning for Sparse-View CBCT Reconstruction	C2RV (Cross-Regional and Cross-View Learning) is a framework for sparse-view cone-beam computed tomography. It reconstructs 3D images from fewer projections, reducing radiation exposure by over 90% and improving accuracy in medical applications.	• Radiation Reduction: Achieves over 90% reduction in radiation exposure by reconstructing 3D images from fewer projections. • Advanced Feature Aggregation: Leverages multi-scale 3D volumetric representations and cross-attention for precise imaging across views and regions.	

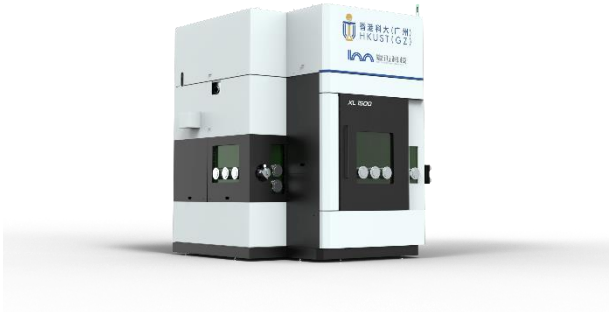
Invention / Project	Description	Key technology edges	Images
		• Broad Medical Applications: Enhances imaging for preoperative planning, interventional radiology, and orthopedics with safer, high-quality diagnostics.	
Low-carbon-emission Photoelectrochemical (PEC) System for Saline Sewage Treatment Coupled with Green H2 Production	A multifunctional photoelectrochemical (PEC) system is developed, using BiVO4-based photoanodes, to perform saline sewage treatment and green H2 generation simultaneously, reducing carbon emission and energy consumption in sewage treatment.	• Utilizing reduced BiVO4 photoanodes by chloride activation for efficient and effective sewage treatment, while achieving cost-effectiveness by avoiding chemical usage. • Offering a low carbon solution in wastewater treatment and green hydrogen generation, marking the steps towards net zero emissions. • Demonstrating high up-scalability and practicality of the designed PEC continuous flow reactor for potential integration in conventional sewage treatment facilities.	 

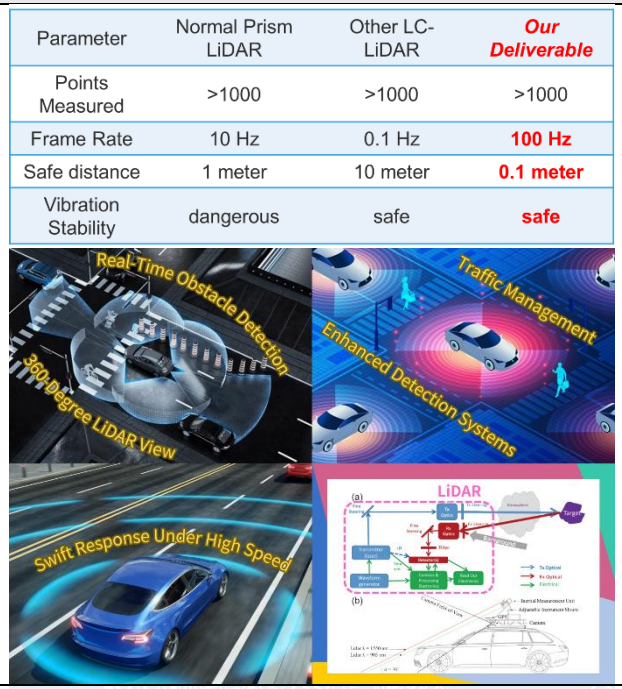
Invention / Project	Description	Key technology edges	Images
Electrochemically-Cycled Oxidation (ECO) an advanced treatment system for resistant wastewater	ECOØ is a patented electrochemical system for landfill leachate treatment. Using coated electrodes and UV energy, pollutants are destroyed (20-30 kWh/m¥) without chemical dosage or sludge production in 15-20 minutes through cyclic oxidant generation.	• Low energy consumption (30 kWh/m3) electrochemical reactor for landfill leachate treatment. • Scaled to 50 m3/day, removing 100% of ammonia and 90% of color in 15ó30 minutes. • Exceeds previous capacity by a factor of 23, with planned scaling to 2000 m3/day	 

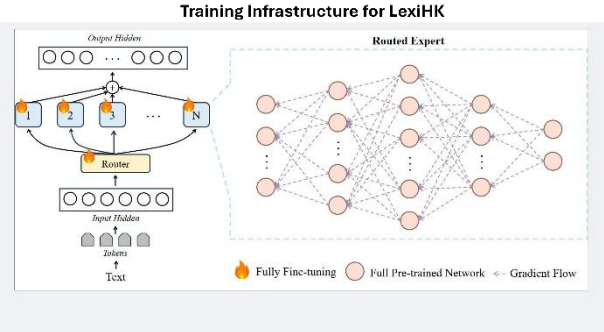
Invention / Project	Description	Key technology edges	Images
BioEnergyCrete+: Carbon-Neutral 3D Biochar-Concrete Printing with Energy Storage	BioEnergyCrete+ innovates biochar-concrete printing with energy storage, enabling carbon-neutral, automated construction and offering smart energy solutions for next-generation infrastructures.	• Carbon-Neutral Construction: Integrates biochar-enhanced concrete printing with energy storage for sustainable, low-carbon, and automated building solutions. • Smart Energy Solutions: Enables self-regulating energy storage in structures, enhancing grid resilience and energy efficiency for next-generation infrastructures. • Advanced Material Innovation: Optimizes biochar-concrete synergy for enhanced durability, thermal regulation, and multifunctional performance in intelligent construction.	

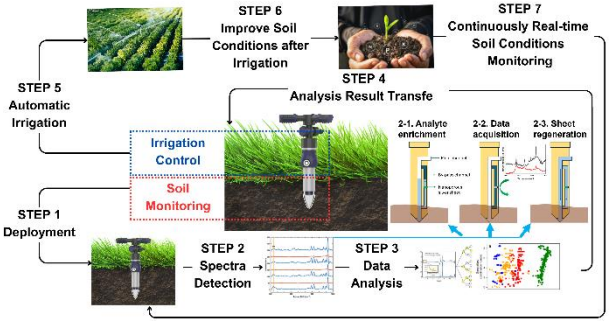
Invention / Project	Description	Key technology edges	Images
GSCo: A Medical Copilot System via Generalist-Specialist Collaboration	GSCo is a medical copilot system via multimodal large language model. It enhances doctors' diagnostic accuracy and efficiency greatly by integrating generalist and specialist AI models, applicable in various fields such as pathology and radiology.	• A Medical Copolit System via Multimodal Large Language Model. • Generalist-Specialist Collaboration Framework for Precise Diagnosis Reference. • A High-Quality Multimodal Medical Knowledge Database for Search and Retrieval.	

Invention / Project	Description	Key technology edges	Images
Elastocaloric Shuttle-coiling Air Cooler	Our desktop elastocaloric air cooler using NiTi shape memory alloys represents green cooling tech. With shuttle-coiling actuation, it delivers compact size and sustained cold airflow, meeting personal cooling needs sustainably and efficiently.	• Green cooling technology. • Efficient elastocaloric cooling. • Personal air cooler. • 100% recyclable solid refrigerant.	

Invention / Project	Description	Key technology edges	Images
A Workpiece Morphology Control Method and System Using a Side-Axis Camera	This invention measures cladding distance errors during additive manufacturing with a side-axis camera with closed-loop control over workpiece accuracy. It allows for an angled camera, avoiding collisions and gouging in multi-axis systems.	• Real-time cladding distance monitoring. • Adaptive feed rate control. • Collision-free compatibility.	 

Invention / Project	Description	Key technology edges	Images
A Vibration-Resilient Fast-Scanning LiDAR for Safer Self-Driving Cars	LiDAR uses lasers to measure distances, which is important for mapping and self-driving cars. Newer systems with ferroelectric liquid crystals can scan 1,000 times faster, making them safer and more reliable than older, slower systems.	• High Precision Measurement: LiDAR provides millimeter-level accuracy in distance measurement, delivering detailed environmental data. • Real-Time 3D Mapping: Its fast-scanning capability enables LiDAR to generate accurate 3D maps in real time, aiding autonomous navigation. • Robust Reliability: The non-mechanical LiDAR with a large field of view ensures reliable performance and driving safety, accelerating the autonomous driving era 5.0 and supporting smart cities, positioning society at the forefront of progress.	
Personalised Real-Time Air Quality Informatics System for Exposure (PRAISE)	A groundbreaking early warning mobile app that provides high-resolution, personalised air quality exposure and health information, empowering individuals to make informed decisions to manage and reduce their daily exposure to air pollution.	• Ultra-High Resolution Air Quality Map: Provides real-time and forecasted air quality visualizations at the street level to identify pollution hotspots. • Activities and Commute Route Suggestions: Offers tailored recommendations for commute times and routes, helping to minimize exposure. • Personalized Exposure Reviews and Health Advice: Analyzes daily air pollution exposure and sends alerts, providing insights to reduce health risks.	

Invention / Project	Description	Key technology edges	Images
Innovative Intranasal Delivery of Peptide for Enhanced Disease Management	The invention involves intranasal semaglutide compositions to treat diabetes, obesity, and neurodegenerative diseases. It improves absorption by bypassing gastrointestinal degradation, avoids repeated injections, and enhances patient compliance	• Non-Invasive Delivery: Provides a painless and highly effective alternative to traditional painful injections and low-bioavailability pills. • Enhanced Absorption: Utilizes bioadhesive gel and tight junction modulators to ensure prolonged contact with the nasal lining and effective transmucosal delivery of large molecules. • Broad Therapeutic Potential: Shows significant promise for treating not only diabetes and obesity but also for Alzheimer's and other severe conditions.	
LexiHK: Legal AI Assistance	LexiHK leverages a proprietary model and legal database to transform Hong Kong's legaltech sector by integrating advanced techniques such as Large Language Models, Natural Language Processing, and Knowledge Graphs. Key modules include Legal Knowledge Retrieval, Contract Evaluation, and Judgment Prediction, all tailored to Hong Kong's unique common law framework and local legislation. Aiming to support Hong Kongìs role as a global	• Proprietary Legal Model: A custom-built model optimized for Hong Kong's unique common law framework and legislation. • Large Language Models: Advanced AI for natural language understanding, enabling precise legal text analysis and contextual insights. • Natural Language Processing: Sophisticated techniques for extracting, processing, and analyzing legal data from diverse sources. • Knowledge Graphs: Structured representation of legal relationships,	

Invention / Project	Description	Key technology edges	Images
	financial center, the project promotes innovation in legal practice, education, research, and access to justice, driving the evolution of the legal ecosystem.	enhancing information retrieval and decision-making processes. • Modular Design: Key components, including Legal Knowledge Retrieval, Contract Evaluation, and Judgment Prediction, address critical legal workflows. • Scalability and Adaptability: The system is designed to evolve with emerging legaltech trends and accommodate future expansions.	
Advanced Intelligent Irrigation System with Spectral Technology on Soil Condition Monitoring	Our invention is an intelligent irrigation device which combines advanced spectral monitoring technology with smart irrigation water-saving systems. It integrates soil monitoring, irrigation control, and irrigation effect feedback monitoring	• Real-time analysis of soil moisture and nutrients, delivering precise soil status monitoring and irrigation demand assessment. • Intelligent adjustments of water supply based on real-time monitoring data, optimizing water resource usage and significantly reducing water wastage. • Highly integrated design, enabling easy deployment by consumers, reducing the complexity of operation.	

Invention / Project	Description	Key technology edges	Images
An Edge Computing-enabled Multi-modal Large Language Model for Real-time Flood Monitoring	Urban areas are increasingly more vulnerable to flooding under the pressing global concern of climate change and extreme weather, challenging the resilience of cities worldwide. This project has established an AI-driven analytical system for predictive flood monitoring and risk management. Urban surveillance videos are processed in low-latency edge computers, embedded with a large language model that possesses multi-modal capabilities of visual question answering, natural language processing and human-alike reasoning. The whole system has been deployed by the Hong Kong government.	• Vision-language model with retrieval-augmented generation framework for flood depth estimation based on actual dimensions of reference objects in urban areas. • Flooding knowledge-enhanced time-series algorithm for flood trending analysis and forecasting for more proactive risk management and emergency preparedness. • Hong Kong territory-wide flood monitoring and alerting dashboard integrated with cost-effective edge computing system for low-latency real-time data analytics