

Singapore Science and Engineering Fair 2023

Main Category Awards

GOLD AWARDS		
S/N	Project ID	Project Title
1	AS004	Ecological footprint of industrial vs smallholder oil palm plantations
2	BE015	Development of an automated virtual reality eye testing system for clinical applications
3	BE021	Evaluating the compatibility of modified ribonucleotides with automated RNA biosensor generation
4	BE023	Analysing Gait Patterns of Parkinson's Disease patients to predict Freezing of Gait (FoG) using Machine Learning Algorithms
5	BH003	EEG Hyperscanning for Objective Assessment of Group Collaboration and Creativity
6	ES005	The bird in the swarm: how to detect and resolve closely-spaced targets in radar
7	ES015	Wifimu: Navigating Indoor Small-Scaled Worlds and Exploring the Intersection of RSSI and IMU for Indoor Localisation
8	ET010	Applications of a Modified 3D Printer in Automating Laboratory Procedures
9	EY010	Solid State Materials for Energy Harvesting and Cooling: from Materials Synthesis, Characterization, and Analysis to Applications
10	MA021	Chromatic Number of Graph Powers
11	MI016	Characterisation of novel phage cocktails against multi-drug resistant Mycobacterium abscessus
12	MS012	Computational Discovery of Highly Sustainable and Efficient Metal Organic Frameworks for SO ₂ Capture
13	MS022	Laser Tuned Micro-fluorescence in Fish Scales for Steganography and Chemical Sensing
14	PH005	Dynamics and Steady Precession of Ring on a Vertical Smooth Rod
15	PH006	Micro-viscosity of Gels studied with Magneto-Impedance Spectroscopy
16	PH015	Reflectarray design based on rectangular phoenix cell
17	PH021	Marangoni Bursting of Volatile Binary Mixture on Viscous Liquid
18	PS021	Varying Voltages Of Electro-Culture On The Growth And Germination Of Amaranthus Dubius And Its Applications In Singapore's Market
19	RO031	Sign2Speak! Synthesising Emotional Speech from Singapore Sign Language through Deep Learning
20	SS021	Real-Time Privacy Preserving Human Activity Recognition Mobile Application based on Pose Classification

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SILVER AWARDS		
S/N	Project ID	Project Title
1	BE012	Evaluation of novel ex vivo protein engineering method for therapeutic purposes: Modulation of cellular surfaces with anti-CD30 receptor
2	BE018	Shielding-Free Signal Noise Suppression in Portable Low-Field MRI
3	BE022	Low Dose, High Accuracy: Using Deep Learning to Enhance 3D Tomography
4	BH008	Cognitive Workload Assessment Using Scalp Brain Signals (EEG)
5	BH017	Neurocognitive Functioning and School Performance in Students With Special Education Needs
6	BI001	Enhancing in-house Biocellulose Production and Application
7	BM004	Molecular Dissection of Inflammatory Signals in Acute Lung Injury
8	BM012	Elucidating the function of MAMDC2 in Head and Neck Squamous Cell Carcinoma
9	BM035	Innovative Anti-Cancer Vaccine Design: A Novel Prioritisation Framework For Neoantigen Shortlisting
10	CB004	Characterising the Role of VHZ Phosphatase in Cancer Development
11	CB006	Study of Single Polymer Dynamics in an Elongational Flow and its Potential Implications on Viral DNA Ejection in T4 Bacteriophage
12	CB016	Characterization of Klebsiella Pneumonia phages for Phage Therapy
13	CH021	Universal Approach for Protein Crystallisation
14	CO013	Evaluation of protein–RNA docking methods
15	EE002	Application of water hyacinth as a low-cost biosorbent for dyes in textile wastewater
16	EE026	Pharmaceutical wastewater treatment by continuous adsorption and electrochemical regeneration of a three dimensional activated carbon electrode
17	EE037	Rapid Detection of Faecal Indicator Bacteria Using Smartphone-Based Platform
18	ET004	A Novel Design of Self-adaptive Morphing Wing System
19	ET019	Use of solid mechanics simulation to evaluate and model the stress distribution within an elastomer for making force sensors and soft robots.
20	MA002	The Steiner Tree Problem
21	MA011	Mountains and Valleys
22	MA028	An optimized prediction model of RON loss in gasoline refining process

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SILVER AWARDS		
S/N	Project ID	Project Title
23	MI009	Nonlesional skin microbiome differs between children with atopic dermatitis (AD) and those with history of AD
24	MS009	Investigation of antibacterial and wound healing propertines of chitosan xerogel extracted from Hermetia Illucens, Black Soldier Fly Larvae(BSFL) for application as a wound healing inductor
25	MS026	Tunable Laser-patterned Dynamic Ag☆O Nano-twinklers: A Comparative Study of Nano-fireworks on ZnO Nanowires and Graphene Oxide Film
26	MS039	Phase Change Material based Thin Film Coating for Tunable Optical Devices
27	PH023	On the Coupled Vibroacoustic Modelling of Tensioned Elastic Membranes in a Pressurised Air Cavity
28	PH027	Inclined Sedimentation of Suspensions: Theoretical and Experimental Investigation into the Boycott Effect
29	PS028	Analysis of Chemical Composition of Artemisia for medicinal and culinary purposes
30	RO008	Intelligent System To Prevent Contamination Of Recyclable
31	RO030	Explainable Video Analytics - A wide area multi-camera tracking perspective.
32	RO037	A Deep Learning Model for Epicardial Adipose Tissue (EAT) Volume Quantification
33	SS024	Interpreting and Evading Visualization-Based Deep Learning Malware Classifiers

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BRONZE AWARDS		
S/N	Project ID	Project Title
1	AS010	Anti-Inflammatory Effects of Mushroom Extracts on Gut Health in the Zebrafish Model
2	BE001	Ex vivo and real time mapping of gastric cancer using an image-guided Raman spectroscopy probe system
3	BE017	Nanoparticles Are At-track-tive: A Novel Approach to Labelling Cells of Interest with Magnetic Nanoparticles for High Clarity Tracking and Imaging
4	BE019	Protein-based Biodegradable Drug Carrier for Controlled Release of Hydrophobic Compounds
5	BE027	Formulation of Antimicrobial Protein-based Hydrogel for Wound Healing
6	BE029	An Intelligent System For Surgical Tools Checking, using Vision and Deep Learning
7	BI004	The Synthesis and Use of Animal Hair (AH) and Activated Carbon (AC) as Effective and Reusable Biosorbents for Oil Spills
8	BM021	Tuning T-lymphocytes to improve wound healing
9	BM033	Development of Small Molecules to Improve Anti-Tumour Immunity in Colorectal Cancer
10	CB019	How the Spike Protein of SARS-CoV-2 Reprograms Cellular Metabolism and the DNA Damage Response
11	CH007	Deep Molecular Dreaming of Next-Generation COVID-19 Drugs
12	CH010	Investigating the Binding of Rhenium Complexes to Heptapeptides
13	CH035	Enantioselective Synthesis of Biaryl Atropisomers using Distal Ionic Interactions
14	CH036	Spatial-Aware Deep Learning for Reaction Property Prediction
15	CO003	Investigation of Different Fragmentation Methods for Fragment Database Preparation
16	CO015	functional structural modelling of a bok choy plant
17	EA004	Analysis of water using precision ellipsometry
18	EE004	Biochar Derived from Chopsticks as an Effective Biosorbent for Pollutant Removal from Wastewater
19	EE006	Image-based vehicle traffic modelling for greenhouse gas emissions
20	EE031	Screening of Food Waste as Alternative Growth Media for Brazzein Protein Expression in Lactococcus Lactis
21	ES007	Wideband Monopole Antenna and Methods to Enhance its Performance
22	ES011	Machine Learning Enabled Edge Intelligence for Monitoring Singapore's Aedes Mosquito Population

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BRONZE AWARDS		
S/N	Project ID	Project Title
23	ET013	Designing And Building A Semi-Autonomous Trolley For Use In School Science Laboratories
24	ET022	Design And Analysis Of An Autonomous Electric Wing In Ground-Effect Drone For Ship Chandling
25	MA019	Dungeons and Dragons Inspired Cantrip Knockout Prediction: Error-minimising numerical investigative system
26	MI001	Optimising in vitro production of late stage Plasmodium falciparum gametocytes for Anopheles sinensis infection
27	MI005	Using Next Generation Sequencing to evaluate the genetic mutation responsible for increased antimicrobial resistance in E.Coli
28	MS020	Power Supply System for Smart Contact Lens
29	MS023	To Investigate the Stretching Dynamics of Knotted DNA Molecules Under an Elongational Field
30	MS034	Silver based coordination complexes enabling fiber for e-textiles
31	PS022	Understanding the Genetic Basis of Resistance to Combined Heat and Drought stress in Arabidopsis thaliana accessions
32	PS039	Novel Growth Method of Microalgae to Increase Protein Content Under Mixotrophic Conditions
33	RO028	Deep Equilibrium BERT
34	RO042	Experiment on Offline Handwritten Mathematical Expressions Recognition Using Deep Learning Models

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MERIT AWARDS		
S/N	Project ID	Project Title
1	AS001	Investigating the effect of food processing on the digestibility of protein in the different types of tofu
2	AS003	Analysis of forebrain cellular activity in experimental neuropathic pain
3	AS006	Investigating the effect of fermented food on the nutrient content of Black Soldier Fly Larvae
4	BE008	Plasmonic Nanostructures Based Surface Enhanced Optical Sensors
5	BE014	Investigating the encapsulation of N-acetylcysteine in PLGA nanoparticles and its effectiveness as an antibacterial agent
6	BH021	Young people's preferences in movies: Evaluating the effectiveness of movie ratings
7	BI002	DNA-binding properties of ruthenium arene oxalato complexes with monocarbonyl analogues of curcumin
8	BI006	Delaying the degradation of Eruca vesicaria and tofu using Mangifera indica seeds
9	BM007	Informatic Molecular Study and Evaluation Method Development of Herbal Tea
10	CB018	Optimization of logic gates for one-step detection of microRNAs via Split loop-mediated isothermal amplification (Split-LAMP)
11	CB022	Developing an Optogenetic O-GlcNAc Transferase for Single Protein O-GlcNAcylation in Cells
12	CH004	Converting Cl ⁻ to Bactericidal HOCl by Zn/Cu Core/Shell Particles and their applications
13	CH018	Obtaining chitin-melanin complexes from Hermetia Illucens and investigating its photoprotective and antimicrobial applications for use in sunscreens
14	CH041	Competing mechanisms in the assembly of tannic acid-gelatin multilayers
15	CO008	A phylogenetic analysis of the 2012-15 dengue outbreak in Sri Lanka
16	CO011	Detailed analysis of swimming behaviour in larval zebrafish treated with Selective Serotonin Reuptake Inhibitors in the light/dark choice anxiety assay
17	EA007	Potential Factors influencing Local Butterfly Biodiversity in Park Connectors
18	EE013	Feasibility of Construction of a PM2.5 Air Filter using Sugarcane Bagasse
19	EE014	Comparing biosorption effectiveness of Copper and Zinc ions using Ganoderma lucidum, Volvariella volvacea and Pleurotus ostreatus
20	EE020	Performance Evaluation of Recycled Acyl-Modified Chitosan Filtration Membranes on Polluted Water Using Spectroscopic Techniques
21	EE033	Plastic-eating worms: what can we learn from the worms to deal with plastic waste?
22	EY005	Sustainable Hydrogen Generation by Degradation of Biomass

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MERIT AWARDS		
S/N	Project ID	Project Title
23	EY014	Investigating the Effect of Biochar on the Performance of a Microbial Fuel Cell
24	MA001	On the Application of Inequalities Containing Sums of Minimum/Maximum of Numbers
25	MA004	A.I. Training and Data Labelling with Data from the Real Environment
26	MA018	On the Modification of Recursive Sequences of the form $a_n = a_{n-1} + a_{n-j}$
27	MA022	The study of the views of Singapore youths on the possibility of HPV vaccine made available to young male Singaporeans
28	MA034	Utilising the SEIR Model to Simulate the Implementation of a Lockdown During the COVID-19 Pandemic
29	MS035	ImpEMITrable: Testing Materials and Gasket Shielding Abilities in Building a Faraday's Box
30	MS043	Sound Reduction Capabilities of Biocomposites Synthesised from Food Wastes
31	PS041	Phytoremediation properties of common fresh water plants
32	RO029	Building of Natural Language Processing Application to aid in Politeness Transfer
33	RO045	Investigation of Gear and Push-Pull Tilting Mechanisms of Drones for Tree Inspection
34	RO046	School Surveillance System with an Autonomous Land Vehicle
35	SS008	Real-World Implementation and Security Analysis of Structured Encryption on Amazon Web Services
36	SS013	Alternative Inertial Tracking Protocol for Whiteboard AirPen
37	SS028	Detecting Malware Samples using a Novel Feature Vector and Deep Learning Methods
38	TM008	Mounting a combat against the terminator, Glioblastoma: Using combinatorial chemotherapeutics
39	TM010	Investigating the synergistic effects of combining Wnt pathway inhibitors GB1874 or AB4 together with an innate natural killer immune cell line, NK-92MI on two different commercial colorectal cancer cell lines, SW480 and HCT116

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SSEF SPECIAL AWARDS		
Special Award	Project ID	Project Title
Electrochemical Society, Singapore Chapter (ECS) Special Award	EY006	Extracting Biofuel from Corn Cobs
	EY007	Optically and Wirelessly Re-chargeable Buffer Batteries
	EY014	Investigating the Effect of Biochar on the Performance of a Microbial Fuel Cell
Institution of Chemical Engineers (IChemE) Singapore Award	EY002	Comparison of Energy Output of Active and Passive Solar Trackers
	EY010	Solid State Materials for Energy Harvesting and Cooling: from Materials Synthesis, Characterization, and Analysis to Applications
James Dyson Foundation (JDF) Design Engineering Award	ET010	Applications of a Modified 3D Printer in Automating Laboratory Procedures
	ET022	Design And Analysis Of An Autonomous Electric Wing In Ground-Effect Drone For Ship Chandling
	EY002	Comparison of Energy Output of Active and Passive Solar Trackers
	EY010	Solid State Materials for Energy Harvesting and Cooling: from Materials Synthesis, Characterization, and Analysis to Applications
L'Oréal Special Award for Innovation in Sustainability	BE027	Formulation of Antimicrobial Protein-based Hydrogel for Wound Healing
L'Oréal Special Award for Innovation in Dermatology and Cosmetology	MI008	Metagenomic and metatranscriptomic profiling of human gut Bifidobacteria in relation to infantile atopic eczema
	MI009	Nonlesional skin microbiome differs between children with atopic dermatitis (AD) and those with history of AD
The Institution of Engineers, Singapore (IES) Special Award	EE019	HYBRID ECOBIKE
	EY007	Optically and Wirelessly Re-chargeable Buffer Batteries

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SSEF SPECIAL AWARDS		
Special Award	Project ID	Project Title
Singapore Association for the Advancement of Science (SAAS) Special Award – Poster Award for Science Communication	AS010	Anti-Inflammatory Effects of Mushroom Extracts on Gut Health in the Zebrafish Model
	BE022	Low Dose, High Accuracy: Using Deep Learning to Enhance 3D Tomography
	BH003	EEG Hyperscanning for Objective Assessment of Group Collaboration and Creativity
	BI006	Delaying the Degradation of Eruca vesicaria and tofu using Mangifera indica seeds
	BM021	Tuning T-lymphocytes to improve wound healing
	CB022	Developing an Optogenetic O-GlcNAc Transferase for Single Protein O-GlcNAcylation in Cells
	CH025	Developing a Novel Detection Method for Butyrates, a Medicinal Food to Improve Gut Health
	EA007	Potential Factors influencing Local Butterfly Biodiversity in Park Connectors
	EE023	Food Waste to Green Fabric
	ET013	Designing And Building A Semi-Autonomous Trolley For Use In School Science Laboratories
	MS022	Laser Tuned Micro-fluorescence in Fish Scales for Steganography and Chemical Sensing
	PH021	Marangoni Bursting of Volatile Binary Mixture on Viscous Liquid
	PS021	Varying Voltages Of Electro-Culture On The Growth And Germination Of Amaranthus Dubius And Its Applications In Singapore's Market
RO031	Sign2Speak! Synthesising Emotional Speech from Singapore Sign Language through Deep Learning	
SS014	Designing a User Interface of a Speech Therapy Application for Aphasia Patients	

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SSEF SPECIAL AWARDS		
Organisation	Project ID	Project Title
Singapore Mathematics Society Award for Ingenuity	MA001	On the Application of Inequalities Containing Sums of Minimum/Maximum of Numbers
	MA002	The Steiner Tree Problem
	MA033	SSP: An Alternative Perspective to NTRU
Singapore Society for Microbiology and Biotechnology (SSMB) Special Award	MI005	Using Next Generation Sequencing to evaluate the genetic mutation responsible for increased antimicrobial resistance in E.Coli
SUTD R&I Award: Artificial Intelligence	RO014	Designing an Autonomous Platform using Hobbyist Robotics Embedded Computing for Performing Geospatial 3D Mapping
	RO037	A Deep Learning Model for Epicardial Adipose Tissue (EAT) Volume Quantification
SUTD R&I Award: Aviation	ET004	A Novel Design of Self-adaptive Morphing Wing System
	ET022	Design And Analysis Of An Autonomous Electric Wing In Ground-Effect Drone For Ship Chandling
SUTD R&I Award: Cities	EE031	Screening of Food Waste as Alternative Growth Media for Brazzein Protein Expression in Lactococcus Lactis
	EE033	Plastic-eating worms: what can we learn from the worms to deal with plastic waste?
SUTD R&I Award: Healthcare	BE015	Development of an automated virtual reality eye testing system for clinical applications
	BE023	Analysing Gait Patterns of Parkinson's Disease patients to predict Freezing of Gait (FoG) using Machine Learning Algorithms
SUTD R&I Award: Multi-Disciplinary	ET010	Applications of a Modified 3D Printer in Automating Laboratory Procedures
	RO046	School Surveillance System with an Autonomous Land Vehicle
SUTD R&I Award: Sustainability	EA004	Analysis of water using precision ellipsometry
	EE013	Feasibility of Construction of a PM2.5 Air Filter using Sugarcane Bagasse

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SSEF SPECIAL AWARDS		
Organisation	Project ID	Project Title
Yale-NUS College Special Award	AS005	An investigation of the effectiveness of administering aspartame mixture to <i>Hermetia illucens</i> to create a viable model for Obsessive Compulsive Disorder
	AS006	Investigating the effect of fermented food on the nutrient content of Black Soldier Fly Larvae
	MA007	Project Wordle
	MS006	Development of aerogel fat blockers from sugarcane bagasse and corn leaves
	PH005	Dynamics and Steady Precession of Ring on a Vertical Smooth Rod
	PS011	Effects of water availability for plants growing in zero gravity