

# Part 4 Projects - 2023 Display Day

## Drone Technology

ID	PROJECT TITLE	STUDENTS
2	On the Development of Tethered, Modular, Reconfigurable, Aerial Robotic Vehicles	Geoffrey Huang, Masahiro Kobayashi
29	Variable Pitch Propellers for Highly-Agile Drones	Lex Hostler, Raymond Hu
36	Improving Control Allocation for Over-actuated Multirotor UAVs	Sam Gilbert, Jos Spaans
37	Drone Flight Control for Contact Testing of Power Lines	Katrina Chan, Jonty Kirk
46	Drone Airframe Optimisation	Cameron Dallas, Benjamin Holt

Lunch Time	Judging Time
11:40-12:20	11:00
11:00-11:40	14:15
11:00-11:40	13:00
11:00-11:40	13:45
12:20-13:00	11:30

## Design/Systems Engineering

ID	PROJECT TITLE	STUDENTS
14	Investigating effective CAD teaching: fun and foundations	Angelito Castro, Megan Noronha
78	An integrated energy harvester for powering wireless vibration sensors	Lachlan Pearce, Rory Reade
82	299 Motor Optimization and Development	Nason Hameed, Akitha Medagoda
116	Developing design labs for Part II students	Camelle Maree Cal
117	Automatically generating solution proposals for the Warman Design Project	Alex Lasenby, Stefan Zdravkovic
118	Design guidance system for machine design projects	Hayden Banks, Leroux Van Zyl
119	Assessment and improvement of a method to create new designs by combining existing variants	Kevin Isidro, Jerome Wijesurendere

12:20-13:00	11:30
11:40-12:20	11:00
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11:00-11:40	14:15

## Smart Materials and Microtechnologies

ID	PROJECT TITLE	STUDENTS
32	Manufacture of laser induced graphene electronic sensors from seaweed	Elizabeth Chan, Aaron Lew
34	Extrusion 3D Printing with Aqueous Two Phase Systems	Evan Hoflich, Josh Leake
35	Adapting a desktop Inkjet printer for Braille printing	Dom Alexander, Jacob Church
44	Electrical power generation using triboelectric generator	Bhumik Mahesh Patel, William Pickett

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## Dynamics and Control

ID	PROJECT TITLE	STUDENTS
48	Tidal energy for powering marine farms	Salustiano Rodriguez-Ferrere, Jean-Daniel Rosset
49	Underwater energy harvesting from ocean waves	Samuel Grant, Jamie O'Dochartaigh
79	Vibration-based rail structure condition monitoring	Luis Viel Corrales, Peter Thompson
81	Wearable energy harvesting	Amrit Singh, Sanjeev kumar Somnath

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## Mechatronics

ID	PROJECT TITLE	STUDENTS
15	Sequentialization of Nodal designs for 3D printing to increase assembly efficiency	Akhil George, Gareth Spencer
24	IOT based optimal variable control for maximisation of hydroponic plant harvest	Ruby Osborne, Tristan Pilditch
25	Remote Anomaly Detection for IoT-based Health Condition Monitoring of Industrial Robots	Joshua Lin, Samuel North
43	Design and Development of a Smart Sensor for Detecting Sewer Flow Conditions	Sabina Aquino, Brianna Breeze

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## Auckland Space Institute

ID	PROJECT TITLE	STUDENTS
38	Enhancing classical control laws with reinforcement learning	K'vaan Valabh, Sumukha Viswakarma
55	Multi debris removal tour design	Alastair Crasto, Filip Kus
65	Gravity off-loading system for a multi-element deployable spacecraft structures	Hazen Mahon, Matthew Oates
68	Damping mechanism for passive deployable spacecraft structures	Toby Ryder, Daniel Shi
98	Ultra-Low profile Reaction Wheel Assembly	Taylan Boyle, Vivek Panchal

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## Mechanics of Materials and Manufacturing Processes

ID	PROJECT TITLE	STUDENTS
11	3D Printing for wearable technology	Yerin A Liam Tompkins
12	Food 3D printing for customized nutrition	Reylet Clarisse Esguerra, Jessica Fang
10	Recycling Thermoset Composite Waste through Binder Jet 3D Printing	Cindy Chang, Emma Sim-Smith

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30	Manufacture of Small Structural Components using Waste Stream CFRP as a Sheet Moulding Compound	Joshua Cates, Matthew Yang	11:00-11:40	13:00
33	Design and build of powder characterisation apparatus for powder bed 3D printing	Ashna Prasad, Kanako Tanaka	11:00-11:40	13:15
57	Development of a Secondary Vacuum-Bag Curing Process for 3D Printed Continuous Fibre Epoxy Components	Justin Reiter, Jerry Sun	11:00-11:40	13:30
58	Lightweight protection for vehicle-side inductive charging pads	Ahimsha Saravanapavan, Erika Joy Yson	12:20-13:00	11:30
62	Are conventional heat exchanger design heuristics applicable to ultra-high surface area (gyroid) heat exchangers?	Matthew Inglis, Felicia Nasrun	11:00-11:40	14:15
69	Thermal Performance of a Small-scale Fast-charging IPT System for Electric Vehicles	Reagan Kelly, Keaton Mackenzie	11:40-12:20	11:15
72	Designing polymer blends for high impact strength	Jinda Dong, Vidushan Jayaratnam	12:20-13:00	11:30
73	Producing high performance polyester tapes	Matthew Hall, Liam Maguire	11:00-11:40	14:30
76	Enhancing Bond Strength using Additive Manufacturing; Design Optimisation of Selective Laser Melting 3D Printed Surface Topologies	Benjamin France, Toby Smeets	11:00-11:40	14:30
77	Manufacture of Carbon Fibre Thermoplastic Composites, Utilising Waste Plastic Blends	Zehuan Gao, Janusha Gunasekara	11:00-11:40	14:15
97	Using high voltage DC plasmas to modify polymer blends suitable for high impact strength	Elias Fritzen, Nick Goodall	11:40-12:20	11:00
106	Wet spinning of highly conductive carbon fibres	Ollie Lennox, Callum Richards	11:00-11:40	13:15
107	Stretchable and flexible biocarbon-based strain sensor for human motion monitoring or robotic applications	Fraser Eade, Allen Liu	11:00-11:40	14:30
108	3D printing of waste plastic-based polymer composites	Bradley Hall, Neil Mario	11:00-11:40	13:00
109	3D printing of a polymer blend for robotic applications	Zachary Fletcher, Rafael Yang	11:40-12:20	14:15

## Robotics

ID	PROJECT TITLE	STUDENTS		
1	A Humanoid Platform and Human Robot Interaction Framework for Deaf and Deaf- Blind Communication with the American Sign Language	Sennah Lee, Matthew Shepherd	11:40-12:20	13:00
3	[CDP-ECSE] Reinforcement Learning Based Control for Dexterous Robotic Manipulation	Ben Hart, Koen Van Rijnsoever	11:40-12:20	11:15
4	On Ultra-Flexible Robotic Manipulation Systems for Industrial Assembly	Harry Bond, Rhys Holland	12:20-13:00	11:30
9	ABB Robotic Arm 3D printing for Repair	Jean van Zyl, Joe Wickens	11:40-12:20	13:45
26	Development of a treadmill based test rig for analysis and validation of legged robots	Willem Scott, Stephen Xie	11:40-12:20	13:00

27	Remote Gantry Controller for Tele-Medicine Applications	Toby Osborne, Yijie Ren
47	Robotic Motorway Barriers - An Autonomous, Reconfigurable and Self-docking Solution	Dylan Meleisea, Christopher Simonds
99	Localisation and Position Control for a Mobile Robot Remote Lab	Jee Soo Kim, George Reddish
103	Intuitive and Dexterous Teleoperation of Mobile Robotic Manipulation Platform	Caleb Parker-Lee, Jesse Weston
105	Safe human-robot collaboration via active collision avoidance	Jarrold Chan, Matthew Horning

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## Biomechatronics

ID	PROJECT TITLE	STUDENTS
6	A convolutional neural network for detecting visual texture	Imogen Chang, Leo Mooney
7	A convolutional neural network that extracts depth from images	Samuel Reedy, Nic Zwager
13	Investigating mechanical design of medical devices to be used in developing countries	Lily Cheetham, Isabella Vesty
45	Automatic Saliva Injection and Temperature System for a Mastication Robot	Joshua Kennard, Jun Park
52	Development of a low-cost tabletop system for hearing aid users	Nikitta Jam, Alice Oh
74	The visibility of cyclists	Sherry Cheng, Bhakti Patel
75	Are two fingers better than one? Using 3D printing to understand the neural mechanisms of touch	Vu Bach, Yuzhang Tan
110	Detecting sleep apnea in clinical EEG recordings	Haochen Zhang, Jeffrey Zhou

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## Aero-Fluid-Hydrodynamics, Thermal Dynamics and Heat Transfer

ID	PROJECT TITLE	STUDENTS
16	Aerodynamic effects of masts upon yacht sails	Sami Naseem, George Pinker
17	Development of a VPP for an AC90 Yacht	Alex Barbarich-Bacher, Arshia Mathur
18	Natural Convection Heat Transfer Through Enclosed Cavities	Dexter Brick, Toby Main
19	A re-evaluation of methods used to predict the performance of transpired solar collectors	Jedidiah Kueh, Campbell Lin
28	Free Flight Testing of a Fixed-Wing UAV in a Wind Tunnel	Isabelle Burr, Jannik Wittgen
31	Flying Met Station	Hannah Brighouse, Kathy Hastie
66	Design and Build of a Hydrodynamic Test Rig	Sam Howarth, James Walmsley
67	Reliable artificial rain generation	Josh Posadas, Penisuiti Tata
84	Thermal measurements for reusable space launch systems	Michael Gatland, Jamie Spencer
85	Space and Sustainable Development	Cameron Edwards, Sarthak Tripathi
89	[CDP-CEE] Decoding attributes of a successful engineer	Tina McIntosh, Canaan Setefano

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91	Yacht aerodynamics using CFD modelling and wind-tunnel experiments	Sam Creevey, Balin Mitchell
93	The fluid mechanics of bottle emptying	Taylan Onan, Christos Sanft
94	Turbulent fluid flow over flexible vegetation	Ryan Buist, Joe Chan
102	Wind Flow Modelling for Urban Air Mobility	Ronan Lee, David Tribhuvan
113	Roll behavior of Small Fixed Wing UAVs in Gust Conditions	Lewis Brown, Peter Vodanovich
115	Wake steering of a small wind turbine under turbulent flow conditions	Cy Mills, Madhav Pandalai
120	Smart CO2 Reduction through Heat Recovery in the Cooling System	Robert Duncan, Leo Lu

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## Industry 4.0 Smart Manufacturing Systems

ID	PROJECT TITLE	STUDENTS
8	Stem assembly (O-ring fitting) automation system	Travis Augenstein, Andreas Hamschmidt
39	IoT device for automatic farm gate detection	Matthew Welcome, Youjia Xu
40	Flexible, low-cost real-time monitoring system	Krysan D'Souza
41	Smart control and data analytics for a quality inspection system at ABB	Botao Dong, Hang Sun
42	Low Cost Automated Quality Inspection of Welded Pipes	Thomas An, Bobby Sun
59	Development of a portable, cost-effective and automated quality inspection system at ABB	Kenji Komori, Wei Ting Teo
104	Fully-automated hydraulic hose-making solution	Indu Narahenpitige, Brian Yu
111	Smart Tension Indicator	Michelle Mahoney

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## Acoustics Research

ID	PROJECT TITLE	STUDENTS
20	Measuring the acoustic properties of wall absorbers after they have been installed in a room	Jack Budge, Oscar Lin
23	Real-time acoustic environment simulation to improve vocalist performance	Jessica Robinson
53	Language learning tool based on speech acoustics	Jenice Kuzhikombil, Anahera Roestenburg
56	Acoustic resonance based metasurfaces for low frequency sound attenuation	Joel Griffin, Tim Peck

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71	Making an impact: next-generation metamaterials for robots and intelligent structures.	Luna Luo, Joel Riddell
86	Investigation of Trees as sound scatterers - is there potential to design tree planting patterns as meta-material, band-gap noise barriers?	Oliver Marchl, Haydn Nicholson

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