

**NewRIIS**

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Devan Nair Institute for  
Employment and Employability  
Singapore 609607

## Newcastle Research and Innovation Institute

Postgraduate Research Projects for:

Doctor of Philosophy (PhD)

Master of Philosophy (MPhil)

If you are interested in the following projects, please be in direct contact with  
supervisor for further information

Marine Technology	
Project Title	Supervisor
<ul style="list-style-type: none"> <li>• Ship and Offshore Hydrodynamics</li> <li>• Climate Change, Sea-Level Rise and Floating Solutions</li> <li>• Decarbonization and Alternate Fuel</li> <li>• Renewable Energy, Energy Efficiency and Management</li> <li>• Green Ship &amp; Offshore Technology</li> <li>• Shipyard Technology Management and Practice</li> <li>• Digitalisation and Digital Twin</li> <li>• Sustainability Development Goals in Maritime and Offshore</li> <li>• Sustainable Ship Recycling and Offshore Decommissioning</li> </ul>	<a href="#"><u>Dr Arun Dev</u></a>
<ul style="list-style-type: none"> <li>• Intelligent Systems Design</li> <li>• Data Mining</li> <li>• Predictive Modelling</li> <li>• Machine Learning</li> <li>• Energy Storage System (Battery)</li> <li>• PV system</li> <li>• Acoustics</li> </ul>	<a href="#"><u>Dr Cheong Siong Chin</u></a>
<ul style="list-style-type: none"> <li>• Engineering design</li> <li>• Efficiency Improvement</li> <li>• LNG Transportation &amp; Storage</li> <li>• Modeling and Simulation</li> <li>• ORC and Trigenation Cycles</li> <li>• Combustion and Emissions Control</li> </ul>	<a href="#"><u>Dr Ivan CK Tam</u></a>
<ul style="list-style-type: none"> <li>• Fluid-structure interaction (FSI) analysis for very flexible marine structures with important applications in offshore energy and aquaculture devices.</li> <li>• Analysis of wave overtopping and its impacts on coastal structures and human bodies</li> <li>• Nonlinear wave-wave interaction in coastal region</li> <li>• Stochastic analysis on random wave load and extreme value prediction</li> <li>• Design and analysis of wave energy converter (WEC) under extreme wave conditions</li> <li>• Global dynamic load and response analysis for offshore wind turbines</li> </ul>	<a href="#"><u>Dr Hao Chen</u></a>
<ul style="list-style-type: none"> <li>• Fluid-structure interaction (FSI) and fluid-thermal-structure interaction (FTSI)</li> <li>• Flow control, hydro energy harvesting and hydrodynamics stability</li> <li>• Heat and mass transfer and renewable energy (wind turbine and hydrogen gas turbine)</li> <li>• Reduced order model (ROM) and machine learning (ML) for fluid dynamics</li> <li>• Finite element method (FEM) and turbulence modeling</li> </ul>	<a href="#"><u>Dr Bin Liu</u></a>
Chemical Engineering	
Project Title	Supervisor

<ul style="list-style-type: none"> <li>• Bioinspired materials for biomedical and environmental/maritime applications</li> <li>• Nanomaterials-based bio/chemical sensors</li> <li>• Antimicrobial materials and applications</li> <li>• Clean technology and sustainable materials</li> <li>• Nano-Photosensitizers for biomedical and antibacterial applications</li> <li>• Theranostic materials (diagnostic+therapy)</li> <li>• Fluorescent materials for bioimaging and photodynamic therapy</li> <li>• Food safety and analysis</li> <li>• Water quality monitoring and on-site nanosensors (heavy metals, toxins, bacteria, etc.)</li> <li>• Metal nanoparticles synthesis and optical applications</li> </ul>	<a href="#">Dr Yen Nee Tan</a>
<ul style="list-style-type: none"> <li>• Food waste processing to functional materials</li> <li>• Drying /dehydration techniques on biomaterials</li> </ul>	<a href="#">Dr Kent Chin</a>  <a href="#">Dr Yen Nee Tan</a>
<ul style="list-style-type: none"> <li>• Analysis of system of systems – neural networks based coordinated control systems</li> <li>• Design of sustainable industrial cities – integrating 'waste to resource' with the chemical process industry</li> </ul>	<a href="#">Dr Pavan Kumar Naraharisetti</a>
<ul style="list-style-type: none"> <li>• Healthy aging, cell therapy, stem cells and tissue engineering</li> <li>• Study of occupational health issues using in-vitro cell and tissue models</li> <li>• Sustainable bioreactor and bioprocess development for producing products</li> <li>• Environmental Engineering – pollution monitoring and abatement technologies</li> </ul>	<a href="#">Dr Ng Yuen Ling</a>
<b>Electrical Power Engineering</b>	
<b>Project Title</b>	<b>Supervisor</b>
<ul style="list-style-type: none"> <li>• Siting and Sizing of Battery Energy Storage Systems</li> <li>• Smart Electric Charging Strategy for Urban Distribution Systems</li> <li>• Uncertainty management in Urban Distribution Systems</li> <li>• Data analytics for Fault Detection, Isolation and Restoration</li> <li>• A Multi-Agent System Approach to Ensure a Resilient Cyber-Physical System</li> </ul>	<a href="#">Dr Anurag Sharma</a>
<ul style="list-style-type: none"> <li>• Compensation of time delay in smart grid system</li> <li>• Force Reflecting Control for Bilateral Teleoperation System Under Time-Varying Delay</li> <li>• Developing a Wearable Rehabilitation Robotic Device</li> <li>• Underwater autonomous vehicles</li> </ul>	<a href="#">Dr Khalid Abidi</a>
<ul style="list-style-type: none"> <li>• Solid state transformers for smart microgrid systems</li> <li>• Advanced Power Electronics for Resilient Active Distribution Networks</li> <li>• PE technologies for applying Energy Storage in Resilience Applications</li> <li>• Fault tolerant DC-DC converters for mission-critical applications</li> </ul>	<a href="#">Dr Naayagi Ramasamy</a>

<ul style="list-style-type: none"> <li>• Advanced PE solutions for the future grid applications</li> </ul>	
<ul style="list-style-type: none"> <li>• Single-stage DC-AC power conversion for renewable energy system</li> <li>• Multilevel inverters with improved reliability and fault-tolerant operation</li> <li>• Model predictive control for power converter system</li> <li>• Multi-terminal HVDC power transmission system using MMC</li> </ul>	<a href="#">Dr Sze Sing Lee</a>
<ul style="list-style-type: none"> <li>• Hybridization of Physical and Virtual Energy Storage System</li> <li>• Microgrid/Nanogrid for Future Energy Solution</li> <li>• Microgrid Inter-operability for Resilient Power Network</li> <li>• Investigation on Cyber-Physical Security Vulnerabilities in Smart Grids</li> </ul>	<a href="#">Dr Jianfang Xiao</a>
<ul style="list-style-type: none"> <li>• Investigation on Cyber-Physical Security Vulnerabilities in Smart Grids</li> <li>• IT/OT Convergence Intrusion Detection System for Microgrid</li> <li>• Digital Twinning and Co-Simulation for Cyber-Physical Power System</li> <li>• Adaptation of Reinforcement Learning in DERMS for Optimal Energy Trading and Management</li> <li>• Cyber Kill Chain Framework for Cyber-Physical Power Systems</li> <li>• Advanced Persistent Cyberthreats on Microgrid Dispatch Functions: Threat-Defense Modelling</li> <li>• Security-Reliability Trade-off for DER-driven Ancillary Services in Transactive Grid</li> <li>• Securing Virtual Inertia-based Inverter from Cyberthreats</li> </ul>	<a href="#">Dr Muhammad Ramadan</a>
<b>Mechanical Engineering</b>	
<b>Project Title</b>	<b>Supervisor</b>
<ul style="list-style-type: none"> <li>• Object Recognition on Mobile Devices using Machine Vision and Lean AI Analytics</li> <li>• Smart Robo Advisors for Manufacturing Task Management using AI and Automaton</li> </ul>	<a href="#">Dr Zi Jie Choong</a>
<ul style="list-style-type: none"> <li>• Intelligent monitoring of structures in bridges</li> <li>• Smart prosthesis for rehabilitation</li> </ul>	<a href="#">Dr Jun Jie Chong</a>
<ul style="list-style-type: none"> <li>• Design and prototyping of service robotics in the areas of: Waiter robot Toilet cleaning robot</li> </ul>	<a href="#">Dr Michael Lau</a>
<ul style="list-style-type: none"> <li>• Additive manufacturing</li> <li>• Microwave heating of materials</li> <li>• Lightweight metal alloys and composites</li> <li>• Computational materials</li> </ul>	<a href="#">Dr Eugene Wong</a>
<ul style="list-style-type: none"> <li>• Sustainability issues: Reuse, Reduce, Recycle</li> <li>• Repair of damaged composite materials</li> <li>• 3D printing of composite materials</li> <li>• Design, characterisation, modelling of novel composite materials</li> </ul>	<a href="#">Dr Kheng Lim Goh</a>