The Advanced Remanufacturing and Technology Centre (ARTC)								
No.	**Department**	**A*STAR Supervisor's Name**	**Email**	**Designation**	**Project Title**	**Project Description**	**Degree Awarded By Upon Graduation**	**Website Link (if any)**
1	Additive Manufacturing Industrialisaiton	Samudrala Saritha Kowmudy	Saritha_Samudrala@artc.a-star.edu.sg	Developent Scientist	Tailoring of microstructures for improvement of fatigue and creep performance		NUS/NTU/SUTD	
2	Additive Manufacturing Industrialisaiton	Wong Kin Keong	Wong_Kin_Keong@artc.a-star.edu.sg	Development Scientist	Machine learning for alloy development	Develop machine learning methodology to achieve robust characterization and development of metal alloy in AM laser powder-bed fusion techniques.	NUS/NTU/SUTD	
3	Advanced Robotic Applications	Nikhil Somani	nikhil_somani@artc.a-star.edu.sg	Advanced Development Scientist	1. Learning complex robotic manipulation tasks for industrial applications 2. Motion planning and control for mobile manipulators	1. Robotic technology for manufacturing is rapidly changing. Robots are becoming safer and more flexible, which will drive innovation for developing more complex, collaborative processes for the industry. ARTC robotics group is developing innovative capabilities in robotic processes such as vision-guided robotic pick-and-place, mobile manipulation, collaborative assembly, component handling & logistics. Grasping and manipulating objects is a key enabling technology for these processes. This project will focus on developing algorithms for learning complex, fine-grained robotic manipulation tasks using AI technologies such as reinforcement learning. 2. Optimal motion planning is a classical problem in robotics and remains an active research topic. Following recent trends of flexible manufacturing, robot trajectories can no longer be fine-tuned offline, and must be computed on-the-fly based inputs from various sensors, e.g. 2D and 3D cameras. In case of mobile manipulators, there is an additional challenge due to the combination of different kinematic structures. In a collaborative environment, the robotic system must also be able to react to dynamic changes in the environment. In this project, we aim to develop algorithms for computing optimal, collision-free trajectories for the robot based on sensor inputs.	NUS/NTU/SUTD	
4	Advanced Robotic Applications	Bai Fengjun	bai_fengjun@artc.a-star.edu.sg	Advanced Development Scientist	1. 3D object detection and tracking 2. Distributed mobile robot navigation based on deep reinforcement learning 3. visual slam for indoor mobile robot	Robotic technology for logistics and warehouse is rapidly changing. Robots are becoming safer and more flexible for variety of applications, such as bin-picking, self-picking, etc. ARTC robotics group is developing innovative capabilities in robotic processes such as vision-guided robotic pick-and-place, mobile manipulation, mobile robots, component handling & logistics. This project will focus on developing algorithms for 3D object detection and tracking for robotic picking applications. Also we are interested in looking into vision based SLAM and distributed mobile robot navigation based on deep reinforcement learning if there are multiple robots working together in the warehouse or factory shopfloor.	NUS/NTU/SUTD	
5	Advanced Robotic Applications	Xie Zhen	xie_zhen@artc.a-star.edu.sg	Advanced Development Scientist	AI based robot manipulation		NUS/NTU/SUTD	

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6	Data-Driven Surface Enhancement	Niroj Maharjan	maharjan_niroj@artc.a-star.edu.sg	Development Scientist	Laser-assisted processing for improved surface integrity of machine components	Surface integrity is crucial for any machine components as failure typically initial from surface defects. In addition, special surface properties like increased load bearing capacity, improved wear resistance, and surface functionality are required depending on specific applications. Lasers are able to generate unique surface properties in metal components to meet these growing needs. However, the mechanism of such transformation is still not fully understood. Interaction between laser beam and material is a very complex process with lots of factors (laser type, processing environment, material properties, etc.) affecting the final outcome. Therefore, this project aims to investigate the material changes when using high power lasers. Particularly, thermomechanical effects of laser beam on metal parts is the main topic of interest. The developed understanding will be useful for development of laser-assisted processing for manufacturing and remanufacturing applications.	NUS/NTU/SUTD	
7	Data-Driven Surface Enhancement	Ampara Aramcharoen	amparaa@artc.a-star.edu.sg	Group Manager	Process monitoring for surface enhancement processes		NUS/NTU/SUTD	
8	Advanced Remanufacturing	Dr. Aravind Raghavendra	aravindr@artc.a-star.edu.sg	Advanced Development Scientist	1. Development of sensorized tooling technologies 2. Application of actuated tooling in machining processes	1. Develop rotary tools with sensing capabilities to monitor the machining process 2. Develop and implement actuated tools for hard to machine/brittle materials to the required surface integrity	NUS/NTU/SUTD	
9	Advanced Remanufacturing	Dr. Du Siwei	du_siwei@artc.a-star.eud.sg	Advanced Development Scientist	1. Microstructure and properties in Additive Manufacturing alloys	1. To evaluate different aspect of microstructure of LMD alloys using different etching methods, so that to develop a low cost method to understand the microstructure of LMD alloys. The microstructure of the LMD alloys may correlate to the Charpy impact mechanical properties of the alloy. 2. The study will generate image and data for computer vision and machine learning for automated welding process monitoring. So that the results may support to build automatous welding system with in process vision.	NUS/NTU/SUTD	

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10	Advanced Remanufacturing	Dr. Davide Verdi	davide_verdi@artc.a-star.edu.sg	Technical Lead	1. Effect of corrosive environment on the wear behaviour of Metal Matrix Composites coatings applied by laser Direct Energy Depositon 2. Effect of Singapore weather on the properties of funcionally graded materials obtained by laser Direct Energy Deposition	1. Metal Matrix Composites (MMCs) are commonly used in industrial sectors such as energy production and transport for their superior wear resistance properties. However, the high temperatures and corrosive environments to which they are commonly exposed may deteriorate the materials properties leading to premature and/or chatastrofic failures. This project aims to characterise the resistance to wear and corrosive-wear behaviour of MMCs coatings applied by laser Direct Energy Deposition under different environmental conditions. 2. Singapore is characterised by a warm and humid weather during the entire year, with temperature that oscillate between 27 and 32°C but may reach lower peaks of 22-23°C during rainy seasons. In addition, it is characterised by a corrosive sea atmosphere. This adverse conditions may alter the properties (e.g. electrical coductivity) of metallic components. In this project, funcionally graded materials will be generated by laser Direct Energy Deposition for various applications in aerospace, automotive, optoelectronic, and energy production sectors. The exposure to Singapore weather on their funcional properties (e.g. electrical, thermal conductivity) will be studied over different conditions.	NUS/NTU/SUTD	
11	Virtual manufacturing	Yang Shanshan	yangs@artc.a-star.edu.sg	Team Lead	1. energy efficiency /management 2. Sustainability index for supply chain management 3. close loop product design	IIoT enabled sustainability evaluation, based on real time data feed from supply chain operation; Improve product life cycle design and management	NUS/NTU/SUTD/SIT	
12	Condition Monitoring	Du Chunling	Du_Chunling@artc.a-star.edu.sg	Advanced Deveoplemnt Scientist	Advanced Data Analytics with Machine Learning for condition monitoing	Machine learning (ML) along with signal processing for feature extraction is a critical necessity in condition monitoring systems. This project involves the methodology development based on ML algorithms for advanced analytics using data from the deployed sensors on manufacturing CNC machines. ML models for the manufacturing machines are to be developed to detect anomalies or quantitatively predict product quality during production. Further, transfer learning model for failure detection is to be developed for machines deployed with limited amount of data.	NUS/NTU/SUTD	
13	Condition Monitoring	Amir Bahador	bahadora@artc.a-star.edu.sg	Advanced Development Scientist	1. sensor integration, design and development of sensorised tools 2. mechanical engineering design and simulation 3. Dynamics and vibration, vibration based NDT		NUS/NTU/SUTD	

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14	Condition Monitoring	Deepesh Upadrashta	Upadrashta_Deepesh@artc.a-star.edu.sg	Scientist I	1) next-generation smart sensing technologies for structural health monitoring 2) Data-driven approach for damage detection	The goal is to monitor large scale infrastructure like pipeline systems, bridges, railway tracks and buildings using distributed sensor network such as fiber optic sensor technology. Furthermore, developing algorithms to detect, locate and classify defects in real-time	NUS/NTU/SUTD	
15	Intelligent Product Verification	Cheng Fang	chengf@artc.a-star.edu.sg	Group Manager	Intelligent Instrumentation for in-line measurement and inspection	Development of in-line dimensional measurement / metrology and intelligent defect detection	NUS/NTU/SUTD	
16	Intelligent Product Verification	Cheng Fang	chengf@artc.a-star.edu.sg	Group Manager	Machine vision inspection assised by Deep learning	2D/3D machine vision system development for defect detection using deep learning; deep learning algorithm development based on minimum training sample size	NUS/NTU/SUTD	
17	Intelligent Product Verification	Andrew Malcolm	andrew_malcolm@artc.a-star.edu.sg	Deputy Group Manager	X-ray Computed Tomography (XCT); (a) Dimensional metrology (b) AI for automated analysis of XCT images (c) Alternative reconstruction (or data extraction) processes	(a) Investigation of factors that influence the uncertainty of measurements. (b) To develop methods for extraction of features and information from X-ray images with minimal user intervention (c) Work towards removing CT reconstruction as a bottleneck to the overall inspection process	NUS/NTU/SUTD	
18	Intelligent Product Verification	Joseph Lifton	Lifton_Joseph_John@artc.a-star.edu.sg	Development Scientist	3D measurement and characterisation of metal additively manufactured structures	Presently, it is impossible to non-destructively measure the inaccessible internal dimensions of additively manufactured (AM) components using tactile and optical instruments. Dimensional measurements are required to verify that components have been fabricated correctly. X-ray computed tomography (XCT) is a non-destructive instrument that can solve this measurement problem.	NUS/NTU/SUTD	https://www.a-star.edu.sg/artc/technology-themes/intelligent-product-verification

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19	Intelligent Product Verification	Zhang Zhen	zhang_zhen@artc.a-star.edu.sg	Development Scientist	(a) UT Inspection of 3D Anisotropic Metals in Additive Manufacturing using TFM (b) UT Inspection of Composites (c) Guided wave inspection of composite structures	Develop non-destructive inspection solution to anisotropic material using ultrasound and guided wave through numerical simulation and experiment.	NUS/NTU	https://scholar.google.com/citations?hl=en&user=4IBPqb4AAAAJ
20	Intelligent Product Verification	Wong Zheng Zheng	wong_zheng_zheng@artc.a-star.edu.sg	Development Scientist	(a) Evaluation of hybrid nondestructive testing (NDT) techniques for engineering applications (b) Optical Coherence Tomography (OCT) for nondestructive testing (NDT) applications	(a) It is not straightforward to inspect many modern engineering materials (such as composites) and components (e.g. complex shapes), and one possible approach is to combine and hybridize different NDT techniques into a suitable inspection solution. Efficiency can also be further enhanced by automating the inspection solution. (b) OCT is commonly used in medical applications but room exists for OCT to be applied to non-medical uses such as FMCG products or engineering components. Efficiency of the inspection can be improved if OCT is integrated into an automation or robotic setup.	NUS/NTU/SUTD	
21	Intelligent Product Verification	Pavlovic Mato	pavlovic_mato@artc.a-star.edu.sg	Senior Scientist	Automation of the NDT process: Planning, Inspection, Evaluation.		NUS/NTU/SUTD	
22	Virtual Manafacturing Group	Bao Huy Huynh	huynh_bao_huy@artc.a-star.edu.sg Humza-akhtar@artc.a-star.edu.sg	Deputy Group Manager Humza Akhtar Group Manager	Machine Learning-based Supply Chain Planning and Risk Management	To develop machine learning models, methodologies, and frameworks to perform supply and demand planning, and risk management from various sources of data in order to improve resilience and responsiveness of supply chain upon disruptions	NTU	
23	Digital Manufacturing Group	Yuan Miaolong	yuan_miaolong@artc.a-star.edu.sg	Scientist III Team Lead	1. Human-robot collaborative AI for advanced manufacturing and engineering 2. Predictive analysis in supply and demand planning 3. Deep learning for real-time workflow tracking	Focusing on building and deploying AI/ML capabilities in manufacturing activities	NUS/NTU/SUTD	
24	Digital Manufacturing Group	Myo Kyaw Sett	lee_nanzhou@artc.a-star.edu.sg	Deputy Group Manager	Machine learning and computer vision methods for visualization controls and interactions in the manufacturing virtual environment using pattern recognition algorithms.	In the age of Industry 4.0, the operators in a manufacturing control room require to work with digital content such as factory KPI dashboards, live dashboards and controls on multiple displays. Manipulating and arranging the displays and their layout with a user's face, posture and gesture could be more natural, automatic, secured and interactive for the control room operators.	NUS/NTU/SUTD	

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25	Smart Manufacturing Group	Alejandro Seif	alejandro_seif@artc.a-star.edu.sg	Development Scientist	IoT and Edge computing for seamless manufacturing assets cnnectivity in the factory of the Future		NUS/NTU/SUTD	
26	Digital Manufacturing Group	Alireza Alghassi	alireza_alghassi@artc.a-star.edu.sg	Technical Lead	Analytic automation for monitoring and root cause analysis of system process and product quality, I4.0, AI, Computer Vision, Control System.	Focusing on building and deploying AI/ML capabilities in defining the I4.0 industries for the future, including: 1) Data analytics and AI in Oil and Gas structural health monitoring. 2) Data analytics and AI Micro-Particle Detection & Tracking in Pharmaceutical/Biotech and Manufacturing. 3) Data analytics and AI Machine health management where one prognosis abnormal status of a machine based on 4) Extracted features from a group of implemented sensors (i.e., Vibration, Acoustic Emission, Pressure, Force, Temperature, Microphone, and Hydrophone, etc.) Alternatively, controller parameters (KPIs). 5) Data analytics and AI for supply chain, forecasting within the inventory, demand, and supply. 6) Data analytics and AI in Robotics help robots detect items they had never seen before and recognized objects with far detail.	NUS/NTU/SUTD	
27	Intelligent Product Verification	Salila Vijayalal Mohan Hari Krishna	hari_krishna@artc.a-star.edu.sg	Development Scientist	Capacitive Imaging: Development of low-cost sensors for FMCG and other applications (mechanical design & integration, electrical circuit design/simulation, programming, etc.)	In a high-volume food and beverage production environment, non-destructive and real-time inspection of various stages of food production from raw material processing to product assembly in real-time at high speed is a challenge. Specifically, contamination, powder caking, seal integrity, package integrity and product quality assessment are some issues, which are currently addressed using human inspection and/or destructive, expensive and offline screening methodologies. This is addressed utilizing a capacitive approach.	NUS/NTU/SUTD	
28	Virtual Manafacturing Group	Tan Wei Chit	tan_wei_chit@artc.a-star.edu.sg	Development Scientist	Machine Learning and Blockchain for Data-driven Sustainability	To propose, implement and optimize the data-driven approaches, either machine learning or blockchain, to be used to resolve the data management and data analytics of sustainablity index towards Industry 4.0	SUTD	
29	Virtual Manafacturing Group	Le Nam Tuan	le_nam_tuan@artc.a-star.edu.sg	Advanced Development Scientist	(a) Indoor Localization using Optical communications and Machine Vision (b) Resource management and QoS control for Microservices architecture	(a) Development visible light communication, optical camera communication, localization techniques based on computer vision. Integrate to scheme to mobile robot for indoor localization. (b) Performance and evaluate QoS model for microservices architectures. Propose new QoS and resource management for microservice architectures	NUS/NTU/SUTD	
30	Virtual Manafacturing Group	Le Van Dang	le_van_dang@artc.a-star.edu.sg	Research & Development Scientist	Automation task sequencing optimization and simulation.	The project focus on developing algorithms for optimizing task sequencing under a set of contraints using control theory, data analytics, and AI models. The algorithms will be verified via simulation methods and applied for automation control systems, task scheduling problems in industry and dynamic systems.	NUS/NTU/SUTD	