

## Themes of Individual Research Training (2015–2016)

Followings are the themes performed in 2015–2016. The theme will be decided at the start of Individual Research Training.

Graduate School	Department	Research Theme
Faculty of Science	Mathematics	Riemannian metrics
	Physics	Circular Dichroism in Bilayer Graphene
		Fabrication and characterisation of two types of solid-state batteries
		Statistical Analysis of the Creation of the Higgs Boson in High Energy Particle Collisions
	Geophysics	Optimization Program and Massly Construction of Galaxy
	Chemistry	Investigation of the Solution Structure of Serum Amyloid A3 using Fluorescence Correlation Spectroscopy
	Earth and Planetary Materials Science	Petrography of scoria from the 2015 eruption of Aso volcano, Japan
	Biology	Mitochondrial Transport in <i>C. elegans</i>
		PHYLOGENETIC ANALYSIS OF EXOTIC MOLLUSCAN SPECIES AND ESTIMATION OF ITS IMMIGRATION
	Mechanical and Aerospace Engineering	
Velocity Measurement of a Funnel-shaped Vortex by PIV Technique		
High Possibility of Double Network Gel to Achieve Ultra-Low Friction		
Research on Dynamic Collision Avoidance for PaDY Robot		
Study on microstructure and properties of silica and silicon carbide		
Phenotypic and Genotypic Investigation of <i>Pteris multifida</i> under High Arsenic Stress		
Application of efficient second-order minimization algorithm in microscope observation system		
Real-time Control of Manipulator		
AUTOMATION OF MANUAL RESUSITATOR		
Pin Display Mechanism using SMA Wire		
Impact Force Identification of Isogrid Stiffened Panels		
A Numerical Simulation of Peristaltic Fluid Flow in the Small Intestine		
Difference in the distribution of traction force in the contact area at the shoe–floor interface between young males and females		
Rotation Matrix Based 9-DOF IMU Sensor Fusion		
Minimizing Energy Use of Vibrating Mirrors in Pocket Projectors		
Vibration Energy Harvesting with Switching Circuit		
Developing a Palpation Sensor System for Breast cancer Research		
Impedance measurement for predicting joint resistance of a mechanical lab joint in a High-Temperature Superconductor		
Autonomous Indoor Navigation for Mobile Robots Using Hough Transform		
Hand tracking with build-in webcam		
Influence of breaking edges on whisker growth on passivated Al film through stress migration		

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School of Engineering		Study of CFD-based Aeroelastic Reduced Order Model Program
		Determine the Correlation between Parameters of Cavitation Bubbles Induced by a Pulse Laser
		Development of UV Light Intensity Checker using Silicon Photodiode
		Testing TACC's Interactive Parallelization Tool
		Chemical Bonding and Mechanical Properties of Diamond-Like Carbon Films Grown by Photoemission-Assisted Plasma-Enhanced CVD
	Information and Intelligent Systems	The Voice-Interactive Toy for Visually Impaired Children
		Exploring Cross-device Interface via Stack Actions
		A Test of PI Control on Foot Movements with Functional Electrical Stimulation
		Surveillant Crawler Manipulated by a Raspberry Pi
		Frequency Control of Thermal Power System Using Ramp Rate Dispatching Control of Multi-Agent System
		Mobility Management with Software Defined Network
		Implementation of Synchronized SS-CDMA on Software Defined Radio Devices
		Mobile Computer Vision
		Implementation of Various Cryptographic Algorithms in OCaml
		Applying Modern Pathfinding to Regular Hexagonal Grids
		Demonstration of Software-Defined AM Radio
		50.76 Tbit/s, 235 ch-WDM pol-mux 18 Gbaud 64 QAM coherent optical transmission over 160 km in full C-band with injection locking
		An Energy Efficient Method for Minimizing Energy Consumption in User Equipment in Storage-Embedded Heterogeneous Networks
		Branchcast: Employing Multicast onto a CDN
		Smartphone Based Medical Monitoring Technology
		Flash Card Application for Second Language Acquisition with Automated Card Production and Enhanced Memorization Exercises
		Overlapping Information on Real World
		Pre-Processing and Layout Analysis for Offline Handwriting recognition
		Framework for manipulating XML in SML#
		Child-rearing Advising Support System based on Multiagent System
		Development of a virtual auditory display based on binaural sound reproduction
		Design of Yagi-Uda antenna Composed of Loop Antenna Elements
		Detecting Visual Attention
		OpenMP Parallelization of a Classic String Detection Algorithm
		Design of Low-pass Digital Filter

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		Integration of Document Oriented Databases within a Type Safe Language	
		Increase of the Overlap of the Electron and Hole Wavefunctions of AlGa <sub>N</sub> MQW Devices via Alloy Modulation	
	Applied Chemistry, Chemical Engineering and Biomolecular Engineering	The adsorption of Pb (II) ion on delaminated layered double hydroxides	
		Investigation of Cerium Oxide Catalysts for DMC Synthesis from CO <sub>2</sub> and Methanol	
		Effect of Molecular Weight of Polystyrene on Migration of Nanoparticles in Polymer Thin Films	
		Synthesis and Luminescent Properties of Tb(III) Complexes with a Dipodal Schiff Base	
	Materials Science and Engineering	N Doping Effect in Cr <sub>2</sub> Ge <sub>2</sub> Te <sub>6</sub> Phase Change Material	
		Analysis of the interface structure of Friction Spot Stir Welded medium carbon steel	
		Al-Si alloy with AlN surface as phase change material	
		Resistance-dependent behavior of piezoelectric energy harvesters under temperature change	
	Civil Engineering and Architecture	Effect of fluid viscous damper on the response of bridge column	
		Assessment of Landslide Hazard Map using the Probability of Landslide Model in Southern part of Thailand	
		Comparison Study of Heavy metal Removal Using Reed Biosorbent	
		ANALYSIS OF SHORELINE VARIABILITY VIA EVEN AND ODD METHOD AT DARANG RIVER MOUTH, VIETNAM	
		Town Park of Cattle - Regional Sustainability for New Livestock Market	
		A 2015 Analysis of the Reconstruction Progress of Kamaishi City	
		Damage Detection in Concrete through Changes in Resonant Frequency	
	Faculty of Agriculture	Applied Bio-Sciences	Suppressive effect of trehalose supplementation on broiler chickens exposed to chronic heat stress
			Identification and Immune Characterization of Anti-Inflammatory Lactic Acid Bacteria Isolated from Post-Weaning Porcine Intestines
			Development of High Sensitivity Detection Technique in Products that Enzymatically Synthesize Lactase and Treatment of Allergic Expression to 4-PX sugar.
Isolation of oxalate-degrading bacteria from the gut of green dock beetles			
Applied Biological Chemistry		Inactivation behavior of Escherichia coli by heat and freezing treatments	
		Analysis of Squalene Hydroperoxide Using Tandem Mass Spectrometry	