

Recruitment Fields

Research Domains	Research Areas
① Device & System	<input type="checkbox"/> Multimedia Processing <ul style="list-style-type: none"> - Photorealistic Graphics <ul style="list-style-type: none"> · 3D Object Surface/Volume Segmentation & Modeling, Geometry/Mesh Processing, 3D Animation Processing, Physics (Continuum, Fluid Dynamics)-Based Modeling, Advanced Global Illumination Real-time Ray Tracing, Radiosity, Photon Mapping, etc, Graphic/Real Object Registration, Modeling and Rendering for Mixed Reality - Visual Processing <ul style="list-style-type: none"> · Depth Estimation, Stereo/Multiview Synthesis, Light Field Rendering, Feature Extraction, Motion Estimation, Super Resolution, Video Signal Processing, Computer Generated Hologram, Display Optics, 3D Display Architecture Design, Human Visual Perception - Pattern Recognition <ul style="list-style-type: none"> · Object Segmentation & Tracking, Object Recognition, Face Recognition, Eye/Gaze Tracking, (Big Data-driven) Machine Learning, (Full-body/Hand) Pose Estimation, 3D Feature Descriptor, 3D Vision Processing, 3D Modeling and Motion Graphics, Strong coding skills in C/C++ required
	<input type="checkbox"/> Wearable device <ul style="list-style-type: none"> - Ultra low power system design <ul style="list-style-type: none"> · Analog/RF architecture for communication and bio-signal sensing · Digital logic / processor design · Real time system / OS / Application - Signal processing and modeling <ul style="list-style-type: none"> · Algorithm optimization for low power operation · Mathematical channel modeling
	<input type="checkbox"/> Bio-medical Engineering <ul style="list-style-type: none"> - Bio-signal sensing/acquisition <ul style="list-style-type: none"> · Analog Front End & Digital Logic Design · Non-invasive/Implatable bio-signal Sensing - Bio-signal processing/analysis <ul style="list-style-type: none"> · Feature extraction using Signal Enhancement & Pattern classification · ADF design for noise reduction - Sensor/system architecture <ul style="list-style-type: none"> · Sensor Hardware Design & Implementation · Embedded system and Firmware development - Physiological Analysis <ul style="list-style-type: none"> · Healthcare management tech. based on physiology · Sports science & physiological modeling

Research Domains	Research Areas
① Device & System	<div data-bbox="331 257 999 297"> <input type="checkbox"/> Many-core Computing Architecture </div> <ul style="list-style-type: none"> - Processor Core Architecture and HW Implementation <ul style="list-style-type: none"> · Reconfigurable processor for multimedia/radio processing · 3D graphics core architecture supporting multi-threading · Highly parallel processor architecture - Many-core Processor Architecture and Implementation <ul style="list-style-type: none"> · Many-core processor supporting efficient synchronization mechanism · Interconnect architecture including Network-on-Chip · Memory architecture including hierarchy and coherency protocol · Data streaming architecture and HW task/thread scheduling · Many-core architecture supporting heterogeneous cores such as CPU+GPU · Heterogeneous memory architecture supporting efficient data transfer - Many-core Programming Model <ul style="list-style-type: none"> · Industry standard many-core programming model such as OpenCL · Core architecture specific programming model extension · 3D Graphics supporting programming model such as OpenGL - Software Development Tools <ul style="list-style-type: none"> · Compilers for single/many-core architecture supporting various parallelism · Simulators for architecture modeling and design space exploration · Profiler for analysis of application/architecture performance · Debuggers for increasing SW productivity - Processor Verification Framework <ul style="list-style-type: none"> · Single/Many-core processor verification tools such as random vector generator · Integrated verification framework from application to HW implementation · Automation and parallelization of verification process
	<div data-bbox="331 1332 759 1373"> <input type="checkbox"/> Intelligent Computing </div> <ul style="list-style-type: none"> - Machine Learning & Artificial Intelligence <ul style="list-style-type: none"> · Statistical Machine Learning, Hierarchical Learning, Deep Learning, Large-scale Machine Learning, On-line Learning, Brain Simulation, Graphical Models, Pattern Recognition, Inference, Reasoning, Natural Language Processing, Object Recognition, Scene Understanding - Data Mining <ul style="list-style-type: none"> · Data Mining Theory, High-dimensional Data Mining, Temporal Data Mining - Information Retrieval <ul style="list-style-type: none"> · Data Indexing, Web Search, Multimedia Search, Text Mining, Semantic Search - Large-scale Mathematical Analysis and Algorithms - Big Data Analytics <ul style="list-style-type: none"> · High-performance Distributed Computing and Data Analysis - Computer-Aided Diagnosis <ul style="list-style-type: none"> · Image Segmentation, Image Registration, Neuro Image Analysis 2D/3D Image Feature Extraction

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<div>①</div> <div>Device & System</div>	<div> <input type="checkbox"/> Medical </div> <ul style="list-style-type: none"> - X-ray / CT <ul style="list-style-type: none"> · Detector: Photoconductor material, readout circuit, calibration, detector physics modeling & simulation, validation · X-ray Imaging System: Imaging architecture, system integration, image processing - Ultrasound Imaging and System <ul style="list-style-type: none"> · 3D Imaging, Beamforming(High Resolution, GPU, etc.), US Image Pre-Post Processing,(3D) Thermometry and elastography Imaging/monitoring, Thermal Strain, Analog ASIC design
	<div> <input type="checkbox"/> Brain IT </div> <ul style="list-style-type: none"> - Neuromorphic System research <ul style="list-style-type: none"> · Spike code based information processing - theory, modeling, and simulation (sensory processing, pattern recognition, inference, learning, memory) · VLSI chip design (neuromorphic digital/analog circuit design) · Spiking neural network simulation/parallel computation · Neuro-informatics, and cognitive modeling and simulation/Connectome/Brain map - Brain and cognitive engineering <ul style="list-style-type: none"> · Non-invasive brain-computer interface/Mind reading · Non-contact bio sensor · Transcranial electromagnetic stimulation
	<div> <input type="checkbox"/> Mobile Healthcare </div> <ul style="list-style-type: none"> - Mobile health sensor / noninvasive detection / Optical System Design <ul style="list-style-type: none"> · Excitation/detection Optical Package System · Integrated optics Chip Design · Bio-photonics System Design or Analysis - Mobile health sensor / Bio-medical engineering <ul style="list-style-type: none"> · Physiological signal processing · Detection algorithm
	<div> <input type="checkbox"/> Holographic Display </div> <ul style="list-style-type: none"> - Optical devices (Spatial Light Modulator) for 3D - Optical Device/Element/Component - Optical System (Holographic System, Optical Device) - Display Panel & Module (Backplane Design)
	<div> <input type="checkbox"/> Optoelectronics </div> <ul style="list-style-type: none"> - Optical Device Design & Fabrication, MQW(Multi Quantum Well) design and growth, LD, LED, Modulator - Imaging component Design, Extended Field of View (EDOF) - Optoelectronic Device Physics - Light Modulation Technology - Waveguide optics - Optoelectronic System Integration - Photon Generation & detection - Semiconductor Laser (Laser Physics, Silicon Photonics, Hetero Epitaxy)

Research Domains	Research Areas
<p>① Device & System</p>	<p><input type="checkbox"/> Materials & Devices in common</p> <ul style="list-style-type: none"> - Nano Fabrication technology (Nanoimprinting) - Inorganic Device (Process, Sensor, Detector etc.) - Soft Electronics (Material/Device for Bendable & Stretchable Electronics) - Sensor (Si, Plasmonics, Metaphotonics, Array sensor, 3D-based Sensor) - Nano Device (Carbon-based Nano Device, Bandgap Engineering, Phononics, Nanowire device)
<p>② Materials</p>	<p><input type="checkbox"/> Organic Electronics Materials and Devices for OLED</p> <ul style="list-style-type: none"> - Organic emitting and charge transporting materials design and synthesis - Device fabrication process and evaluation - Device physics (interface analysis, optical analysis, thin film analysis) - Physical Chemistry (material and device degradation mechanism) - Material Science on failure analysis in material and device - Molecular simulation, device simulation <p><input type="checkbox"/> Organic Materials</p> <ul style="list-style-type: none"> - Polymer chemistry and physics - Reaction kinetics, monomer design & synthesis - Electronic optical property control, thermo-mechanical property control <p><input type="checkbox"/> Optical Films for Display</p> <ul style="list-style-type: none"> - Polymeric Materials for optical applications - Film fabrication and coating technology - Polarization and retardation materials - Optical Design and Simulation <p><input type="checkbox"/> Inorganic Materials</p> <ul style="list-style-type: none"> - Solid state physics, intermetallic compound, inorganic material, DOS engineering, nano-structure - Development & fabrication of inorganic powder. - Nano structured materials and applications - Quantum dot, Metal, inorganic nano structure synthesis/characterization <p><input type="checkbox"/> Optical device design and characterization</p> <ul style="list-style-type: none"> - Optical simulation <ul style="list-style-type: none"> · Ray optics, Wave optics, FDTD and Thin film optics - Fabrication, evaluation & characterization of optical device <ul style="list-style-type: none"> · Micro/Nano structure fabrication : Photolithography or Imprinting · Optical property evaluation and characterization for display components <p><input type="checkbox"/> Battery Materials</p> <ul style="list-style-type: none"> - Advanced Li-ion, Post Li-ion and novel energy storage/conversion - Inorganic, nanocomposite and metal alloy for ion storage - Organic/polymer design, synthesis and ionic liquid for ion transport - Electrochemical analysis and modeling

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② Materials	<input type="checkbox"/> Battery System <ul style="list-style-type: none"> - Electrochemical reaction mechanism and thermal/fluidic behavior analysis - Multiscale modeling and simulation of electrochemical cell - Design of electrochemical cell and battery management system
	<input type="checkbox"/> Biomaterials and Bio_based Products <ul style="list-style-type: none"> - Metabolic Engineering (Molecular Biology/Microbiology/Biochemical Engineering) - Microbial Strain Development - Bio-Process Engineering (Biochemical Engineering) <ul style="list-style-type: none"> - Fermentation Process Design, Scale-up, Optimization - Purification Process Design, Scale-up, Optimization
③ Computational Science & Analytical Science	<input type="checkbox"/> Computational approaches for materials/devices <ul style="list-style-type: none"> - Atomistic modeling/simulation - First-principles, Molecular dynamics, Monte Carlo approaches - Meso-scale/Multi-scale modeling/simulation - Electronic/thermal transport modeling - Methods for simulation/analysis of device properties
	<input type="checkbox"/> Applications of computational approaches <ul style="list-style-type: none"> - Computational materials and biology modeling/design <ul style="list-style-type: none"> - Inorganic / Organic / Film / Energy materials and System-biology etc. - Theoretical research on solid, optical, statistical physical/chemical science
	<input type="checkbox"/> High Performance Computing & IT Planning <ul style="list-style-type: none"> - Computational/data-driven systems research via algorithms, optimization, and related High Performance Computing methods <ul style="list-style-type: none"> - Grid & Cloud simulation Env. and Services along management. - Big Data Analysis (Splunk, Hadoop, R) - Plan & Direct the development and management of enterprise IT systems related in R&D process, and supports business units. <ul style="list-style-type: none"> - General Business Systems and R&D Management Systems (LIMS, MES)
	<input type="checkbox"/> Structural analysis of organic/inorganic materials and devices <ul style="list-style-type: none"> - Characterization of organic/inorganic materials & devices using electron microscopes based techniques : Microstrucral/compositional/chemical analysis - SEM/EBSD, EPMA, TEM etc.
	<input type="checkbox"/> Nuclear Magnetic Resonance (NMR) spectroscopy <ul style="list-style-type: none"> - Determination of chemical structures of complex molecules - Characterization of organic/inorganic materials in solution and solid-state. - Application of HR-MAS and 2-Dimension technique

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③ Computational Science & Analytical Science	<input type="checkbox"/> Raman spectroscopy <ul style="list-style-type: none"> - Time-resolved Raman, resonance Raman, stimulated Raman, Surface-enhanced Raman spectroscopy - Application of the state-of-the-art Raman techniques to organic and low-dimensional electronic materials - A strong background in laser spectroscopy, particularly ultrafast, nonlinear optical spectroscopy and imaging is required
④ 생명과학	<input type="checkbox"/> Implantable & Surgical Device for Medical Treatment <ul style="list-style-type: none"> - Electromechanical medical device modeling, designing and fabricating <ul style="list-style-type: none"> . Bio-compatible material design for electro-stimulation and bio-signal sensing(closed loop system) . Skills for 3D graphic tools such as Auto CAD and Regulatory Affair experience targeting FDA, KFDA are required . DBS(Deep Brain Stimulation) or electro-surgical device R&D for spinal cord injury are preferred - Bio-signal Analysis and Development of Algorithm <ul style="list-style-type: none"> . Analog Front End(AFE) and digital logic for bio-signal . Perform advanced digital bio-signal data processing such as EEG, EMG, ECG and nerve signals
	<input type="checkbox"/> Radiochemistry <ul style="list-style-type: none"> - Responsible for manufacturing and quality control of radiopharmaceuticals - Molecular probe development & application - Operates, maintains and calibrates automated synthetical equipment - Chemistry and related field

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