

Recruitment Fields

Research Domains	Research Areas
<p>①</p>	<p>□ Multimedia Processing</p> <ul style="list-style-type: none"> - Photorealistic Graphics <ul style="list-style-type: none"> · Advanced Global Illumination (Real-time Ray Tracing, Radiosity, Photon Mapping, etc), Complex Material Rendering, Advanced Post-Effects, GPU-based Parallel Computing and CPU-GPU Hybrid Computing, Physics (Continuum, Fluid Dynamics)-Based Modeling, 3D Animation Processing, 3D Object Surface/Volume Segmentation & Modeling, Geometry/Mesh Processing, 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, Partial Face Detection & Tracking, Eye/Gaze Tracking · Anti-spoofing Biometrics (Finger/Palmprint, Iris, etc.) · Full-body & Hand Pose Estimation, 3D Feature Descriptor · 3D Vision Processing, 3D Modeling and Motion Graphics, Homography and SLAM · (Big Data-driven) Machine Learning, Deep Neural Networks Strong coding skills in C/C++ required
<p>Device & System</p>	<p>□ Wearable device</p> <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
	<p>□ Bio-medical Engineering</p> <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

<p>①</p> <p>Device & System</p>	<p>□ Many-core Computing Architecture</p> <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
<p>①</p> <p>Device & System</p>	<p>□ Intelligent Computing</p> <ul style="list-style-type: none"> - Machine Learning & Artificial Intelligence <ul style="list-style-type: none"> · Deep Learning, Statistical Machine Learning, Reinforcement Learning, Pattern Recognition, Inference, Reasoning, Object Recognition, Scene Understanding - Large-scale Mathematical Analysis and Algorithms - Big Data Analytics <ul style="list-style-type: none"> · Data Mining, Unstructured Data Analysis, Predictive Analytics - Autonomous Robot / Vehicle Perception and Control <ul style="list-style-type: none"> · Map Construction, Localization, Path and Motion Planning, · High Performance Real-time Embedded System Architecture · Detection & Tracking, Sensor Fusion, Statistical Signal Processing - Natural Language Processing <ul style="list-style-type: none"> · Machine Translation, Dialog Management, Language Model, Natural Language Understanding <p>□ Brain IT</p> <ul style="list-style-type: none"> - Neuromorphic Systems and Processor <ul style="list-style-type: none"> · High Performance Low Power Processor Design · Neuromorphic Processor / Sensor design · Low Power VLSI chip design (digital/analog circuit) · Spiking Neural Network based Information Processing (sensory processing, pattern recognition, inference, learning, memory)

<p>①</p>	<p>□ Mobile Healthcare</p> <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 / Embedded system integration <ul style="list-style-type: none"> · Real time OS, Real time signal processing - Mobile health sensor / Chemometrics <ul style="list-style-type: none"> · Bio-signal analytic algorithm based on spectrum data · Multivariate data analysis, Statistics - Mobile health sensor / Optoelectronics <ul style="list-style-type: none"> · Si photonics, Integrated Optics, Bio-photonics etc.
<p>Device & System</p>	<p>□ Optoelectronics</p> <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) <p>□ 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</p> <p>Materials</p>	<p>□ Organic Electronics Materials and Devices for OLED/OTFT</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>□ 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>□ 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>□ Functional Materials for Electric Devices</p> <ul style="list-style-type: none"> - Anti-Shock, Anti-Scratch, Anti-Fingerprint, Anti-Bacterial Materials

<p style="text-align: center;">②</p> <p>Materials</p>	<p>□ 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 <ul style="list-style-type: none"> · Quantum dot, Metal, inorganic nano structure synthesis/characterization · Inorganic-organic hybrid nanostructure design/preparation · Surface modification of nanostructure/characterization <hr/> <p>□ 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 <hr/> <p>□ Battery System</p> <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
<p style="text-align: center;">③</p> <p>Computational Science & Analytical Science</p>	<p>□ Computational approaches for materials/devices</p> <ul style="list-style-type: none"> - Atomistic modeling/simulation <ul style="list-style-type: none"> · First-principles, Molecular dynamics, Monte Carlo approaches - Meso-scale/Multi-scale modeling/simulation - Electronic/thermal transport modeling - Methods for simulation/analysis of device properties <hr/> <p>□ Applications of computational approaches</p> <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 <hr/> <p>□ High Performance Computing & IT Planning</p> <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) <hr/> <p>□ Structural analysis of organic/inorganic materials and devices</p> <ul style="list-style-type: none"> - Characterization of organic/inorganic materials & devices using electron microscopes based techniques : Microstructural/compositional/chemical analysis - SEM/EBSD, EPMA, TEM etc. <hr/> <p>□ Nuclear Magnetic Resonance (NMR) spectroscopy</p> <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