

# Job Opportunity

Research Domains		Research Areas
Device & System	① Processor& SOC Architecture	<ul style="list-style-type: none"> <li>- Processor &amp; Accelerator Design (Front-End)               <ul style="list-style-type: none"> <li>· Neural Processor, DSP, GPU, CPU, MCU Design</li> <li>· Accelerator, Multimedia Processor Design</li> <li>· SOC architecture, C-modeling</li> <li>· Memory system &amp; Architecture</li> <li>· RTL,VHDL, Verilog HDL, Verilog-A</li> </ul> </li> <li>- ASIC, FPGA,VLSI, Digital circuits</li> <li>- Low power SOC &amp; Circuit design</li> <li>- Compiler</li> <li>- SOC &amp; System simulation</li> <li>- Algorithm optimization for hardware</li> </ul>
	② Recognition & Understanding	<ul style="list-style-type: none"> <li>- Computer Vision, Augmented Reality               <ul style="list-style-type: none"> <li>· Computer graphics, Photo-realistic rendering, 2D/3D Image processing</li> <li>3D Modeling , 3D Map Construction, Scene Understanding, Computational imaging</li> <li>· Pattern Recognition, Visual Tracking, Object Recognition, Detection, Emotion Recognition, Motion estimation, Classification and Clustering</li> <li>· De-noising, De-blurring</li> </ul> </li> <li>- Visual Recognition and Scene Understanding               <ul style="list-style-type: none"> <li>· Pattern Recognition, Object Detection &amp; Tracking</li> <li>· Clustering, Classification</li> <li>· Image Captioning, Visual Question Answering</li> </ul> </li> <li>- Speech and Natural Language Processing               <ul style="list-style-type: none"> <li>· Speech Recognition, Machine Translation</li> <li>· Natural Language Understanding, Language Modeling</li> <li>· Dialog Management, Question Answering</li> <li>· Audio signal processing, Speech signal processing</li> <li>· Information Retrieval, Recommendation, Search</li> </ul> </li> <li>- Emotion Recognition               <ul style="list-style-type: none"> <li>· Facial Expression Recognition, Gaze Estimation, Body Posture/Behavior Recognition</li> <li>· Voice Emotion Recognition, Speaker Verification</li> <li>· Sentiment Analysis, Text Analysis</li> </ul> </li> </ul>

Research Domains		Research Areas
Device & System	③ Autonomous Driving	<ul style="list-style-type: none"> <li>- Autonomous Car, Robot, Drone,</li> <li>- Localization , Mapping, SLAM</li> <li>- Sensor Fusion</li> <li>- Tracking, Prediction Algorithm</li> <li>- Planning &amp; Control Theory &amp; Algorithm</li> <li>- Vehicle Dynamics and Control</li> <li>- ADAS, Functional Safety</li> <li>- Operating System, Embedded System Design</li> <li>- 3D Scene Construction</li> <li>- Automotive ECU Design</li> </ul>
	④ Deep Learning/ AI Theory, Analysis & Simulations	<ul style="list-style-type: none"> <li>- Deep Learning, Statistical Machine Learning, Artificial Intelligence               <ul style="list-style-type: none"> <li>· Supervised Learning, Unsupervised Learning, Reinforcement Learning</li> </ul> </li> <li>- Deep Generative Models &amp; Neural Memory Networks               <ul style="list-style-type: none"> <li>· Bayesian, Variational Bayes, Markov Chain Monte Carlo (MCMC)</li> </ul> </li> <li>- Large-scale Mathematical Analysis and Algorithms</li> <li>- Simulation, Mathematical Modeling, Statistics, Stochastic Process, Physics, Mathematics, Data Mining, Computational Science, Computer Science, Information Theory, Signal Processing, Optimization</li> <li>- High Performance Computing, Distributed Computing</li> </ul>
	⑤ Radar SW/HW	<ul style="list-style-type: none"> <li>- Radar imaging, SAR imaging</li> <li>- RF HW system design               <ul style="list-style-type: none"> <li>· mmWave or high frequency RF HW system design</li> <li>· Antenna design</li> </ul> </li> <li>- Radar baseband HW design               <ul style="list-style-type: none"> <li>· Digital processing system, FPGA board design and programming</li> </ul> </li> <li>- Radar algorithm               <ul style="list-style-type: none"> <li>· Signal processing, distance &amp; velocity estimation, object detection, object classification</li> </ul> </li> </ul>
	⑥ Mobile Healthcare	<ul style="list-style-type: none"> <li>- Mobile Healthcare Sensor               <ul style="list-style-type: none"> <li>· Biophotonics-related experimentalists</li> <li>· Experience in high precision optical measurement and/or Spectroscopy</li> <li>· Photonics simulation (ray-optic, monte-carlo simulation, etc)</li> </ul> </li> <li>- Bio Signal Processing               <ul style="list-style-type: none"> <li>· Feature extraction and Optimization</li> <li>· Information mining from bio-medical data</li> <li>· Bio data based deep learning</li> </ul> </li> <li>- Application of Healthcare System               <ul style="list-style-type: none"> <li>· Human physiology</li> <li>· Analysis of health signal</li> <li>· Bioinformatics</li> <li>· Chemometrics</li> </ul> </li> </ul>

Research Domains		Research Areas
Device & System	⑦ Meta- Photonics/ Photonic device	<ul style="list-style-type: none"> <li>- Active metasurface theory, simulation &amp; Experiment               <ul style="list-style-type: none"> <li>· Active metasurface design for phase modulation, optical device simulation SW (ex. FDTD, FEM, RCWA, TCAD, Sentaurus, etc.), optimization</li> <li>· Knowledge on electro-optic materials (TCO, PCM, TMD, III-V etc.)</li> <li>· Experience in optical design</li> </ul> </li> <li>- Silicon photonics device design               <ul style="list-style-type: none"> <li>· Waveguide optics simulation, Optical device simulation/Evaluation, Diffractive optics</li> </ul> </li> <li>- Experience in TOF Sensor optical system design, Laser optics, optical system design using laser diode, photo detector</li> <li>- Experience in metamaterials, plasmonics, photonic crystal, spectroscopic system, micro spectroscopic system, and nanophotonics</li> </ul>
	⑧ Graphene Device	<ul style="list-style-type: none"> <li>- Thin Film Deposition               <ul style="list-style-type: none"> <li>· ALD, Sputter, CVD</li> <li>· 2D growth experience including Graphene, TMD (ex MoS<sub>2</sub>), h-BN</li> <li>· Experience in epi-growth of III-V semiconductor compound (ex. GaN)</li> </ul> </li> <li>- Organic synthesis               <ul style="list-style-type: none"> <li>· Total Synthesis capability</li> <li>· Experience in C-C bond formation reaction research</li> <li>· Experience in synthesis of Electronic/Medical materials, polymer, dendrimer</li> <li>· CNT, Graphene functionalization experience</li> </ul> </li> </ul>
	⑨ Micro Sensor & Application system	<ul style="list-style-type: none"> <li>- Analog/Digital Circuit               <ul style="list-style-type: none"> <li>· Low power, High SNR Signal Conditioning</li> <li>· Filter, Amp, ADC/DAC Design</li> <li>· Hardware implementation (PCB, ASIC)</li> </ul> </li> <li>- Sensor Signal Processing &amp; Algorithm               <ul style="list-style-type: none"> <li>· Feature extraction, Adaptive filter, Noise suppression, etc.</li> <li>· Machine learning (ex. Speech/ speaker recognition, CASA etc.)</li> <li>· Multi-channel data handling</li> </ul> </li> <li>- Application System Implementation               <ul style="list-style-type: none"> <li>· Firmware, FPGA/DSP based system integration</li> <li>· Data transfer, Controller, GUI development</li> <li>· Windows/Android/Tizen app. SW</li> <li>· JAVA, C++, Matlab, Labview, etc.</li> </ul> </li> <li>- MEMS/NEMS Design &amp; fabrication               <ul style="list-style-type: none"> <li>· Electromechanical simulation (COMSOL, ANSYS etc.)</li> <li>· Experience in Piezoelectric/ Capacitive/ Strain sensor fabrication</li> </ul> </li> </ul>

Research Domains		Research Areas
Material	① Inorganic Materials	<ul style="list-style-type: none"> <li>- Nano structured materials and Applications               <ul style="list-style-type: none"> <li>· Quantum dot, Metal, Inorganic nano structure synthesis/characterization and Device Fabrication</li> </ul> </li> <li>- Development &amp; fabrication of inorganic powder</li> </ul>
	② Organic Materials	<ul style="list-style-type: none"> <li>- Organic Device Physics and Analysis</li> <li>- Organic Sensor Material Simulation and Synthesis</li> <li>- Organic Emitting and Charge Transporting Material Design/Synthesis</li> </ul>
	③ Functional Polymer	<ul style="list-style-type: none"> <li>- Organic Material synthesis</li> <li>- Polymeric Materials for optical applications</li> <li>- Polarization and Retardation materials</li> <li>- Organic-Inorganic Hybrid (Composite)</li> <li>- Curing Chemistry</li> </ul>
	④ Battery Materials	<ul style="list-style-type: none"> <li>- Battery Cell/Pack               <ul style="list-style-type: none"> <li>· Li-ion Battery Materials</li> <li>· Organic materials design and Synthesis (polymer and ionic liquid)</li> <li>· xEV Battery Pack Design, BMS HW Architecture &amp; System SW</li> </ul> </li> </ul>
Platform Technology	① Computational Science	<ul style="list-style-type: none"> <li>- Materials Design, Data Analysis and Optimization Using Machine Learning               <ul style="list-style-type: none"> <li>· New material design algorithm Development based Machine Learning</li> <li>· High Performance Computing Application                   <ul style="list-style-type: none"> <li>→ computational/data driven system research via algorithms, optimization, and related high performance computation method, SW parallel computing &amp; Optimization</li> </ul> </li> <li>· Platform contracture and Development for Machine Learning</li> </ul> </li> </ul>
	② Analytical Science	<ul style="list-style-type: none"> <li>- Time-resolved spectroscopy               <ul style="list-style-type: none"> <li>· Femtosecond laser spectroscopy including multidimensional/absorption/Raman/IR/PL</li> <li>· Optical Microscopy</li> </ul> </li> <li>- Structural analysis using Electron Microscopy &amp; Diffraction               <ul style="list-style-type: none"> <li>· Strong Background in Crystallography</li> <li>· Microstructural/compositional/chemical Analysis of Organic/Inorganic Materials &amp; Devices</li> </ul> </li> </ul>