삼성전자 종합기술원 R&D 박사 및 경력 모집

◆ 모집기간 : 2012년 9월 28일 ~ 2012년 10월 15일 23시 30분
◆ 지원자격 : 관련전공 박사학위자 또는 석사 이후 경력 6년 이상자
  (2013년 2월 박사학위 취득예정 포함)
   ※ 군필 또는 면제자로 해외여행에 결격사유가 없는 자
◆ 모집분야 : R&D (연구개발)
  ① Future IT : Medical Imaging, 3D Image, Intelligence Computing, Brain IT 등
  ② Material & Device : 3D Display, Opto-electronics, 그래핀 등
  ③ 소재기술 : 유무기/Film, 제료/소자 분석 등
  ④ Bio : Bio소재, 바이오신약 등
  ⑤ Energy : 차세대 Battery, Energy Harvesting 등
  ⑥ 모델링/시뮬레이션/분석 ※ 상세모집분야 별첨 참조
◆ 모집인원 : 00명
◆ 근무지역 : 삼성전자 종합기술원 (경기도 기흥 소재)
◆ 지원방법 : 온라인 입사지원
  - 삼성커리어스 접속(www.samsungcareers.com) → 경력사원채용공고 →
    [종합기술원]박사 및 경력사원 채용공고 → 공고 하단 '지원서 작성하기' 버튼 클릭 후 작성함 (※E-mail 입사지원은 받지 않습니다.)
◆ 전형절차
  - 1차 : 서류전형
  - 2차 : 기술면접 및 세미나
  - 3차 : 임원면접
  - 4차 : 건강검진
◆ 제출서류 : 이력서 (※첨부 이력서 양식으로 작성요망)
◆ 관련문의 : 종합기술원 인사팀(jobinfo@samsung.com / 031-280-8039)

contact : jobinfo@samsung.com
# Job Opportunity

## Recruiting

<table>
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<th>Future IT</th>
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## Main tasks

### 3D Image Sensing and Image Processing
- **3D Image Sensing**
- **3D Image Processing & Applications**
  - 3D Depth Reconstruction & Processing, Stereo/Multi-view 3D Reconstruction, Synthesis & Rendering, Pattern classification/Machine learning, etc.
- **Light Field, Computer Generated Hologram Processing**
  - 3D Object Modeling & Reconstruction, Light Field Capturing/Synthesis/Reconstruction, Computational Photography
- **Human Motion Recognition**
  - Pose Estimation (Full-body, Hands), 3D Feature Extraction & Recognition, Big Data-driven Machine Learning, 3D Vision Processing, 3D Modeling and Motion Graphics, Strong coding Skills in C/C++
- **3D Video Coding**
  - Design and develop multi-view video and depth compression algorithms and participate in standardization of video coding
  - Hands on experiences on video coding standards such as H.264/AVC, MVC. Proficiency in C/C++ required

### Medical Imaging and Systems
- **X-ray / X-ray CT**
  - Detector: Photoconductor material, readout circuit, calibration, detector physics modeling & simulation, validation
  - X-ray Imaging System: Imaging architecture, system integration, image processing
  - CT Module and System: Detector, DAS, gantry/slip ring, system integration/optimization, modeling & simulation CT imaging
  - CT Imaging, reconstruction algorithm
- **HIFU System design and signal processing research**
  - HIFU System Arch.& Nonlinear Acoustics, HIFU Transducer Design
  - Beam Focusing Algorithm Design and Implementation
- **Ultrasound Imaging and System**
  - 3D Imaging, Beamforming(High Resolution, GPU, etc.), US Image Pre-Post Processing,(3D) Thermometry and elastography Imaging/monitoring, Thermal Strain
- **MRI Imaging Technology Development**
  - Tx & Rx RF Coil Design & Fabrication
  - Pulse Sequence Design / Development

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<table>
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<tr>
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<th>Main tasks</th>
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<tbody>
<tr>
<td>· Image Reconstruction and Processing</td>
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<tr>
<td>· MRI Simulation (Pulse Sequence, RF Field, etc.)</td>
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<tr>
<td>· New Technique Development</td>
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<tr>
<td>- PET System and Imaging Research</td>
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<td>· PET System Architecture</td>
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<td>· PET Detector and Circuit</td>
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<tr>
<td>· Image Reconstruction and Correction</td>
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- **Haptic Sensor System**
  - Flexible tactile sensor
    - Flexible tactile sensor design using microfabrication techniques,
      Front-end analog circuit design (PCB level), Sensor signal and noise
      measurement using data acquisition system
  - Force sensor
    - Force sensor design for haptic device or robot system using fiber
      optics(FBG), mechanical design and simulation, system integration using
      C language

- **Media Computing System**
  - Audio/Video
    - A/V codec and its implementation on embedded processor
  - 3D image/ultrasound medical image and its implementation
  - Intelligent image processing
    - Camera ISP(image signal processing), Computational Photography,
      Object/Gesture recognition, Robot vision & embedded vision processing
  - 3D Graphics
    - Design expert: Computer graphics(Rasterization, programmable Shader,
      Raytracing, Photon-mapping, Global illumination, Physics-based
      animation, etc.), low power/ high performance GPU design, graphics
      application engine
    - Direct3D, OpenGL, OpenCL, GLSL, HLSL, Verilog, C/C++,
      FPGA/ASIC/SoCs design/implementation/simulation/verification
    - Augmented/Mixed Reality, Feature Detection, Markerless registration,
      Composition
  - System SW
    - Heterogeneous multicore OS
    - Parallel programming language for CPU+GPU
    - Power/Performance estimation and prediction for CPU+GPU

- **RF & Power Conversion Technology**
  - Passive / Active RF device, circuit, and systems
  - Simulation & analytical analysis of circuits & electromagnetics
  - RFIC design & measurement
  - Power electronics devices & modules (H/W, S/W)
    - High-power inverter/converter topology, circuit & control
  - Power management / conversion technology and systems
  - Design and prototyping of control and communication system
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<tr>
<td>□ <strong>Future IT</strong></td>
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| □ **Many-core Computing Architecture** | - Processor Core Architecture and HW Implementation  
  · Reconfigurable processor for multimedia/radio processing  
  · 3D graphics core architecture supporting multi-threading  
  · Highly parallel processor architecture  
  - Many-core Processor Architecture and Implementation  
  · 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  
  · 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  
  · 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  
  · 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 |
| □ **Future Networking & Security** | - Wireless Sensor Network (Body Area Network/Personal Area Network)  
  · Low power RF/Analog circuit design  
  · Low power digital MODEM algorithm design  
  · Real-time embedded system design  
  · Wireless sensor platform design  
  - Information-Centric Networking architecture & Prototyping  
  · Network protocol design and simulation  
  · Network, content, device security algorithm design  
  · Network virtualization and SDN(Software Defined Networking)  
  · Mobility architecture and modeling  
  - Wireless Communication  
  · Wireless network information theory  
  · Interference Management  
  · Channel coding  
  · Multi-hop resource management  
  · Physical-layer security |
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<tr>
<td>□ Intelligent Computing</td>
<td>- Computer-aided Diagnosis</td>
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<td>- Image Segmentation, Image Registration, Neuro Image Analysis</td>
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<td>- Data Mining &amp; Large-scale Data Management</td>
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<td>- Data Mining Theory, High-dimensional Data Mining, Temporal Data Mining, Clinical Data Mining, Sensor data mining</td>
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<td>- Data Indexing, Web Search, Complex Data Management</td>
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<td>- Computational Genomics(Epigenomics background is welcomed)</td>
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<td></td>
<td>- Context-Aware Computing</td>
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<td>- Ontology-Based Context-Awareness, Ontology Modeling &amp; Processing, Semantic Reasoning</td>
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<td></td>
<td>- Machine Learning</td>
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<td>- Large-Scale Data-Driven Learning, Statistical Relational Learning</td>
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<td></td>
<td>- Bayesian Analysis and Graphical Models, Event Detection and Knowledge Discovery, Natural Language Processing, Information Retrieval, Statistical Relational Reasoning</td>
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<td></td>
<td>- Affective Computing</td>
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<td>- Multi-modal Emotion Recognition, Novel Human-Computer Interaction utilizing Human Emotion, Mood Detection, Stress Monitoring, User Modeling &amp; Understanding</td>
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<td>- Personal Informatics</td>
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<td>- Human Activity Recognition, Multi-modal Situation Recognition, Analysis of Activities of Daily Living(ADL),</td>
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<tr>
<td>□ Distributed Storage Architecture</td>
<td>- Large-Scale Distributed File System</td>
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<td>- Distributed node/data management, Fault-tolerance</td>
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<td>- NoSQL Distributed Storage</td>
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<td>- Tabular store, Key-value store, Graph store, Object store</td>
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<td>- Distributed System Modeling &amp; Simulation</td>
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<td></td>
<td>- NAND-Optimal System Software</td>
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<td>- NAND file system, Caching S/W, I/O virtualization</td>
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<tr>
<td>□ Green Communication and Networks</td>
<td>- Green Networks</td>
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<td>- Energy optimized on/off base station operation technology</td>
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<td>- Green network architecture design (signaling &amp; data network separation approach)</td>
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<td>- Green Radio</td>
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<td>- Energy-efficient MIMO technology for multiple antennas system &amp; compact antenna module technology</td>
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| □ Brain IT          | - Neuromorphic System research  
|                     |   · Neural simulator developing and Capable of emulation using GPU  
|                     |   · Spike code-based inference theory and Computer Science,  
|                     |       · Probability/Statistics Applied Physics and related fields  
|                     |   · VLSI chip design(neuromorphic chip, analog chip design)  
|                     |   · Sensory processing using spiking neural network  
|                     |       · Visual/auditory pattern recognition  
|                     |   · Computational neuroscience in learning  
|                     |       · Memory/Inference/Decision making  
|                     |   · Actor-critic model(POMDP, TD-lambda learning, etc)  
|                     | - Brain and cognitive engineering  
|                     |   · Non-invasive brain-computer interface/Mind reading  
|                     |   · Cognitive modeling and simulation/Connectome/Brain map  
|                     |   · Non-contact bio sensor  
|                     |   · Transcranial electromagnetic stimulation  
| □ 3D Modeling in Medical Science | - Single/Multi-Modality Medical Image Segmentation/Registration  
|                     |   · CT, MRI, US, etc  
|                     | - 3D Modeling and Visualization  
|                     | - Solid, Fluid, and Bio-Mechanics Modeling and Simulation  
|                     | - Systems Biology, Data Acquisition/Analysis for Bio-Engineering  
| □ Bio-medical Engineering | - Bio signal sensing & processing  
|                     |   · Biomedical signal acquisition  
|                     |   · Biomedical signal processing(Major: mathematics)  
|                     |   · Physiological modeling  
|                     |   · Design of AFE and/or digital logic dedicated for biomedical signal  
|                     | - Biomedical Optical Imaging Research  
|                     |   · Functional Optical Coherence Tomography(OCT) system architecture and  
|                     |       · signal Processing  
|                     |   · Tissue vs. Light interaction modeling  
|                     |   · OCT Image Enhancement Algorithm  
| □ Medical Robot     | - Mechatronics  
|                     |   · New Actuator (Shape Memory, Piezo, Artificial Muscle)  
|                     |   · Bio-Mimetic System Design & Control  
|                     |   · Ergonomic, Bio-Compatible Design  
|                     | - Optical System  
|                     |   · High-Resolution Stereo Endoscope  

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| □ Opto-electronics | - III-V compound semiconductor optical devices  
- Device specialists (VCSEL, DFB Laser diode, waveguide, photodetector, modulator and Mux/DeMux)  
- III-V material Thin film, optical devices, device fabrication and Measuring high-speed communications system  
- Process, material, device, simulation for GaN LED  
- Oxide sensor, device, material, physics, simulation  
- Optical system/interconnect/modulator  
- Photonic Materials & Device  
  : Energy Convertor, Photonic Crystal for Display device Photonic Crystal synthesis/device/physics/simulation  
- Plasmonic Materials & Device  
  : Sensor, detector, Laser using Plasmonic  
- Optic design for OCT(Optical Coherence Tomography)  
- Optic design for Microscope for medical  
- High Speed Optoelectronics Circuit Design |
| ② Material & Device | |
| □ Holography 3D Display | - Holography, Optics(Nano-optical devices)  
- 3D Display optics, optical devices process and the simulation  
- Optical Design and Fabrication  
- Material/Optic/Device for 3D or 3D Holography  
- Simulation or modeling for 3D/Holography  
- Optical modulator/device  
- Material/device for 3D recording(3D image) |
| □ Nano-scale High-performance Devices | - Quantum(Ballistic) transport, Spin transport, Non-equilibrium Green Function calculation  
- Band to band tunneling in III-V Transistor  
- III-V, Ge epitaxial growth  
- Design based on modeling & simulation of high performance devices such as 3D FET, HEMT(High Electron Mobility Transistor), TFET(Tunneling FET)  
- Nanoimprint Process/Stamp professionals  
- CMOS design professionals  
- LED/Organic image sensor material and device production  
- Nano Crossbar Electronics(such as logic device)  
- Device, material, physics, simulation for Power device  
- Flexible/Printed Electronics(Material/Device/Physics)  
- Simulation or modeling for organic material |
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| - Nonvolatile transistor, materials & device  
  : Ferroelectric, Multiferroics, Heterostructure  
- Stamp transfer printing process/Interface engineering of thin film  
- Solid state physics calculation |
| □ Micro Actuator & Sensors  
- MEMS device design and fabrication  
- MEMS device evaluation and control  
- MEMS packaging design, process and evaluation |
| □ Medical Device  
- Surgical robot system  
  · Surgical Robot Control & Design  
    (teleoperation, force feedback control, surgical instrument design, etc)  
  · Image guided surgery and intervention  
  · Nano imaging and therapeutic system  
- Ultrasound-based medical devices  
  · Functional imaging  
- Medical optics design & fabrication |
| □ Medical Optics & Imaging  
- Optical system/device design & fabrication |
| □ Graphene Research  
- Nano electronic device fabrications and process integrations  
- Graphene and other 2D material growth  
- Material and device simulations |
| □ Electro Luminance Device  
- Molecular design, modeling, Orgainc/polymer synthesis  
- Device fabrication, device evaluation and Process  
- Device Physics |
| □ Organic Chemistry, Physical Organic Chemistry, Chemical Engineering  
- Polymerization, characterization  
  · reaction kinetics, thermo-mechanical property control, electronic property control |
| □ Development of Film Material for Display  
- Optical Polymer Synthesis  
- Polymer Properties, Coating, film processing and optical Characterization  
- Development Experience preferred polymer materials for optical |
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| ☐ **Materials Technology (inorganic/organic/Film/OLED)** | ☐ **Composition of Inorganic Materials Design and Synthesis**  
- Solid state physics, intermetallic compound, Energy, material, magnetic material, DOS engineering, nano-structure  
- Development & fabrication of metal alloy powder.  
  · Gas-atomizer specialist  
  · Design of induction melting system in vacuum  
- Development of hard and soft magnetic materials  
  · Synthesis & analysis of new intermetallic bulk materials  
  · Development of rare earth free permanent magnets  
- Development of soft magnetic composite materials  
  - New materials for hydrogen separation membrane  
  · Metallurgy processing (alloying, foil process, annealing) |
| ☐ **Surface Engineering**  
- Surface Patterning Technology  
  · Nano Imprinting Lithography, Molecular Transfer Lithography  
  · Patternable Materials  
- Surface Energy Engineering  
  · Nano Structure, Interface Chemistry, Fluoro Material  
- Surface Morphology Engineering  
  · Dispersion, Rheology, Coupling Chemistry  
  - Wire Grid Polarizer, Soft Electronics |
| ☐ **Therapeutic Antibodies**  
- Mammalian expression vector & host cell line  
- Antibody-drug conjugates (ADC)  
- Therapeutic antibody targeting autoimmune diseases or cancer  
- Antibody engineering  
- Non-antibody protein scaffolds  
- Regulatory affairs |
| ☐ **Biomaterials and Bio_based Products**  
- Systems biology  
  · Omics (Genomics/Proteomics/Metabolomics/Bioinformatics)  
  · in silico modeling  
- Metabolic Engineering (Molecular Biology/Microbiology)  
  · Strain development  
- Process engineering  
  · Fermentation process  
  · Chemical conversion process |
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<td><strong>Bio</strong></td>
<td><strong>Biotherapeutics</strong></td>
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<tr>
<td></td>
<td>- Cancer biology</td>
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<td>· strong background in mechanistic analysis of cancer signaling pathway</td>
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<td>· excellent technical expertise in molecular and cellular biology</td>
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<td>· cancer stem cell biology</td>
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<td>· genomic/transcriptomic profiling experience using patient samples</td>
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<td>· To Develop, qualify/validate and troubleshoot in vitro/in vivo bioassays.</td>
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<td>- Antibody drug conjugate</td>
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<td>· Antibody-drug conjugates (ADC) general (Design, synthesis, process, etc.)</td>
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<tr>
<td></td>
<td>· Bioconjugate chemistry(Biomolecule bioconjugations)</td>
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<td>· Medicinal chemistry(Anticancer drug design/synthesis/modification, etc)</td>
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<td>· Drug delivery system(Focused on drug conjugation)</td>
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<td>- Mathematical modeling/Quantitative systems biology</td>
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<tr>
<td></td>
<td>· mechanism-based PK/PD modeling</td>
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<td>· mathematical modeling of biological networks/pathways/disease mechanisms/drug responses</td>
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<td>· ODE-based mathematical modeling with statistical analysis</td>
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<th><strong>Drug Delivery and Medical Engineering</strong></th>
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<tr>
<td>- Biocompatible materials engineering</td>
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<tr>
<td>· Drug carrier design and preparation</td>
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<td>· Conjugation chemistry and purification</td>
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<td>· Biocompatible surface engineering</td>
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<td>- In vivo evaluation and analysis</td>
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<td>· Animal test design, PK/PD, toxicity, efficacy analysis</td>
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<tr>
<td>- Diagnosis/therapy integration</td>
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<td>· Molecular imaging, image guided therapy</td>
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<tr>
<td>- Adv.Li-ion / Post LIB (Li-Air etc)/New Energy Storage</td>
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<tr>
<td>· Inorganic, nanocomposite and metal alloy for energy storage, Solid-state chemistry, Computational solid-state physics</td>
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<td>· Organic/polymer design &amp; synthesis, Ionic liquid, MD simulation</td>
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<td>· Electrochemical Analysis and Modeling</td>
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<td>· Analysis of Reaction Mechanism and Thermal/Fluidic Behavior at the Electrode or Cell Level</td>
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<td>· Design/Evaluation of BMS(Battery Management System) or PCS(Power Control System)</td>
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| □ Fuel Cell | - Solid Oxide Fuel Cell  
  - Electrode & electrolyte material design and synthesis  
  - Interconnecter and Sealant material and cell manufacturing process  
  - Cell design, manufacture & evaluation  
  - SOFC stack design, manufacture & evaluation  
  - Analysis of Electrochemical Reaction, Thermal/Fluidic Behavior and thermal stress at the Electrode, Cell and Stack Level. |
| □ Environment | - membranes, electrochemistry, sensors, catalysts, adsorbents  
  - Membrane technology for water treatment and gas separation,  
  - Organic / Inorganic Materials Design and Synthesis  
  - Water/air quality monitoring sensor  
  - CO2 capture and storage, application, CO2/O2 Separation  
  - CO2 conversion and related catalysts / processes  
  - Synthesis and advanced analysis for heterogeneous catalyst |
| □ Energy Harvesting | - Based on mechanical engineering, design and simulation mechanical structure for vibration energy harvesting  
  - Mechanical Impedance/Frequency Matching, wide-bandwidth  
  - Based on power electronics, design and simulation circuit(SOC)  
  - Low power rectification, Control DC/DC convertor for maximum power tracking, wake-up circuit for energy saving  
  - Based on material engineering, piezo material & transducer design and evaluation  
  - Lead/Lead-free piezo material/Thick & Thin film  
  - Nano/flexible piezoelectric materials and device structure for vibration energy harvesting  
  - Nano-organic/inorganic hybrid, piezoelectric/electrostatic device design, processing and harvesting system |
| □ Hybrid Energy System | - High Power & High Efficiency Converter, Inverter & Control circuit design  
  - Multi-Input Renewable Energy Management Algorithm design  
  - Smart Grid Power Management and Control  
  - Design/Evaluation of hybrid renewable/alternative energy system for electric power generation  
  - Hybrid system of fuel cell, battery, solar cell, wind etc.  
  - High efficient energy system(micro turbine, heat pump etc.)  
  - HILLS-based energy & power system integration and test  
  - Numerical Modeling and simulation of (hybrid) energy system  
  - Energy conversion and storage system modeling & analysis  
  - (Conventional) Thermal/Fluid device modeling and simulation |
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<tr>
<td></td>
<td>· EV, HEV, FCV (powertrain) Modeling and simulation</td>
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| □ Physical Modeling & Simulations | - Computational/theoretical modeling and analysis of materials properties  
   · First-principles (Ab-initio), molecular dynamics, stochastic (Monte Carlo), meso-scale simulation research  
   · Multi-scale/multi-physics modeling/simulation  
   · Transport (electronic/thermal/etc.), optical properties, alloy systems |
| □ Theories & Simulations for Systems and Devices | - Design/simulation of micro-devices and their properties  
   - Computation-based and theoretical research in condensed matter/optical/statistical physics and chemistry  
   - Learning/modeling/optimization/algorithms of data-centric systems and related computer science/mathematical research |
| □ Physics–based XPS/UPS, STM, SPM Analysis | - Characterization of organic/inorganic materials & devices using in-situ surface analysis techniques |
| □ Development of Advanced Analysis Techniques using X-ray/Neutron Scattering (EXAFS, XANES, SAXS) | - In-situ analysis of catalysts & energy materials, Characterization of organic thin film |
   - Quantitative analysis of trace level of impurities |
| □ Development of The Analytical Tools for Electric/Magnetic Field Distribution and Structure | - Electric/magnetic field distribution and structural imaging in a local area  
   - Super resolution optical/spectral imaging for soft materials |