

A woman with light brown hair, wearing a purple cable-knit sweater, is shown in profile from the chest up. She is looking down into a crystal ball that she is holding with her right hand. Inside the crystal ball, a miniature, detailed scene of a city or industrial complex is visible. The background is a plain, light blue-grey color.

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The Total Solution Creator  
**Samsung Electronics Device solutions**



## Memory Business

- ▶ **Business Field** : DRAM (DDR, RDD, XDR, GDDR, UtRAM, OneDRAM), Flash Memory (NOR, NAND), Flash Solution (OneNAND, SSD, Card), MCP SRAM (Low Power SRAM, High Speed SRAM), New Memory
- ▶ **Major Technology**
  - **Hardware Design**
    - DRAM(DDR / Mobile / Graphic), Flash memory(Nor / Nand), PRAM, Analog & Digital Circuit
    - Memory Card Controller : RTL Coding, Synthesis, Static Timing Analysis, AMBA-based bus protocol & ARM-based SOC chip design, DFT Implementation, SATA, SAS, PCIe, USB2.0 / 3.0, SD / MMC interface, ARM-based embedded SW development & HW validation, System Verilog Verification, FPGA Implementation & Verification, Signal Processing Algorithm Development for Memory & Storage System, Channel Codes(Error Detection / Correction Codes) Design & HW / FW IP Design
  - **Software Design**
    - System SW, Computer Architecture, Memory & Storage Algorithm Design, FTL, Flash Memory File System, Journaling File System Design, Virtual Memory Management, Cache Algorithm, Dynamic Memory Management, Application Processor, Multimedia Processor, Memory Card Controller F / W, Inter-Processor Communication Algorithm Design, Parallel Processing Algorithm for SMP / AMP multi-Processor, HW & SW Performance Trade-off, SW Engineering, Embedded System Test, Test Case Design, Dependability, Fault Tolerant System Test, Embedded System Development Process, Performance Analysis, OS, I / O System, Storage System, Infra(Clear Case, Clear Quest, Test Automation Tool)
  - **Device Process**
    - Oxidation, Photo Resist, Photolithography, Etch, Diffusion, Cleaning, Thin Film, Ion Implantation, CVD, Metallization, Device Isolation, Transistor, Capacitor, Dielectric, SiO<sub>2</sub> / SiON Gate Dielectrics, High-K / Metal Gate, Device Analysis
  - **Manufacturing Technology**
    - Yield Enhancement, Metrology(Pattern Process Inspection, Critical Dimension Measurement)
  - **Quality & Reliability Technology**
  - **Engineering Statistics, Reliability Engineering(Component & System), Data Mining & Operations Research**



## System LSI Business

### ► Business Field :

- SOC Solution (Mobile CPU, Multimedia SOC, Power management IC, Wireless connectivity, etc),
- LSI Solution (Display Driver IC, CMOS Image Sensor, Smart Card, MCU)
- ASIC / Foundry

### ► Major Technology

- **Design** : Digital design, Analog circuit design, Chip Implementation, RF, Image pixel design, Multimedia IP design (Graphics, Audio, Video), Design verification, High speed I / F, Wireless connectivity, Memory controller, Chip evaluation, Back-end design (Layout), Algorithm (Security, Image processing, Storage) etc.
- **Software** : Embedded S / W (OS, Middle ware, Application), Firmware solution, S / W Engineering, SQA, S / W Infra, Security, Solution Development
- **Device / Process** : Technology Development (28nm, 32nm, 45nm), Unit Process (Lithography, Etch, Diffusion, Thin Film, CMP, Cleaning, Ion Implantation, Metal), Process Architecture, Device / Process Integration, Optic, Optoelectronics, Transistor, Capacitor, Dielectric
- **CAE** : Device Modeling, Process Modeling, CAD, TCAD, Design for Manufacturing
- **PE / Test** : Pattern Inspection, Image Processing
- **Yield Enhancement** : Defect Reduction, Contamination Evaluation , Particle Detection, Chemical Analysis
- **Manufacturing** : Simulation, APC, MSPC / FDC, Logistics / Scheduling, MIS, SCM
- **Strategic Marketing** : Market Research/Analysis, Biz Development, Market Strategy, Product(line) MKT, Overseas Sales, Product Planning, Foundry MKT (Tech. MKT), Customer Engineering (Tier 1 Customer)
- **Planning** : Biz Strategy / Research, Contract/Law Case, M&A / Venture Investment



## LED Business

### ► Business Field :

- Light Emitting Diode (for General Lighting, Back Lighting and Automotive Lighting),
- LED Light Engine (Ambient Light, Down Light)
- LED Lamp (Bulb, MR, PAR, LED Tube)

### ► Major Technology

- **LED Device/Next Generation LED** : Epi Growth and Characterization, Epi & Chip Electrical and Optical Simulation, Device Engineering of Optoelectronic Device, Design and Fabrication of Nanostructure Light Emitter, Multi-Chip Package Design & Process Development, LED Manufacturing Process Development, Device Physics / TEM / SIMS / Surface Analysis / Organic Analysis, CAE Analysis(Vibration, Thermal Analysis, Optics, Package Design, PCB Design, Power Supply Unit Design, Sub-micro Scale Printing & Imprinting Technology)
- **LED Lighting Development** : Indoor / Outdoor Lighting Design & Molding Design, LED Lighting Optics Design, Lighting Quality Evaluation & Quality Control, LED Lighting Heat Sink Design, Heat Sink, Materials Selection & Performance, Evaluation of Heat Sink System(Compulsory Dissipation, Thermal Diffusion / Flow Analysis), LED Driver Design for Lighting / SMPS Pattern Generation
- **Material Development** : New Phosphor Synthesis & Evaluation for LED, Phosphor Coating for LED, Analysis of Quenching Mechanism for Powder Phosphor
- **Manufacturing Technology** : MES Scheduler, FAB/PKG Process & Equipment Engineering, CAE Analysis(Structure Analysis)
- **Quality** : Customer Satisfaction of Lighting Biz(Prefer experienced in the set-maker), LED Lighting Quality Planning & Quality Management for OEM/ODM, LED Module Reliability Analysis, Accelerated Life Test, Highly Accelerated Stress Test)





## Semiconductor R&D Center

► **Business Field** : Semiconductor Advanced Process and Device Technology

► **Major Technology**

- **Advanced Process Development**

- Photolithography (including EUV, e-beam, OPC / RET) Photo Resist, Oxidation, Cleaning & CMP, Diffusion, Thin Film, CVD, Ion Implantation, Metallization, Metrology & Inspection, etc.
- ※ OPC : Optical Proximity Correction (Comput. Litho)

- **Module Development**

- Device Isolation, Transistor, Capacitor, Dielectric
- High-K / Metal Gate, SiO<sub>2</sub> / SiON Gate Dielectric / Low-K, Interconnect, etc.

- **FEOL / BEOL Process Integration (DRAM / Flash / Logic, etc.)**

- **New Memory : PRAM, STT-MRAM, ReRAM, etc.**

- **TCAD / ECAD**

- Process & Device Modeling, Material Modeling
- Circuit Compact / Reliability Modeling, Circuit Simulator Development
- System-level Modeling / Simulation, Virtual platform, HW / SW Co-design
- Simics, CoWare, SOC Designer user
- Memory Controller, Memory Architecture, SSD research experience

- **Advanced CMOS Image Sensor(CIS) Development**

- Pixel Design, Image Signal Processing, Mixed IC Design, Analog/Digital Design, CIS Process Develop

- **Logic Design Infra Development**

- Process design kit development, Design rule generation, Test pattern generation, Layout assembling, Logic digital design, analogy design, circuit simulation.

- **Package Development**

- Flip Chip/Wafer level PKG, Thining and PKG/Chip Warpage control, Vibration and Noise control
- Polymer properties & failure Analysis and Development, Thermal and electrical engineering

- **Material Development & Environment Contamination Control**

- Material(Wafer, PR, Gas, Chemical, Thin Film) Development
- FAB Environment Contamination Monitoring & Control
- Material & Environment Failure Analysis and Quality Guarantee



## Test&Package Center

► **Business Field** : Device Packaging, Module/SSD, Signal Processing & Test

► **Major Technology**

- **Package**

- 3D Package, Flip Chip/Wafer Level Package(WLP/TSV etc.), Package Material(Film, PCB, Solder, etc.) Particle/Contamination/Void Control, Package Reliability Analysis, Package Warpage Control Thermal Distortion Control, Micro Solder Bump, Welding Reliability, Vision/Laser Application(Cutting, Marking, Inspection), Plasma Application

- **Test Technology&Software**

- Signal Processing & Test : High Speed Circuit Design, Power System
- Test Software : Database Design/Optimization, Software Optimization, Embedded(Firmware) Programming, Job Scheduling Algorithm)

- **Equipment Development**

- CAE Analysis : Structure, Dynamics, Thermal, Fluid Analysis/CFD
- Robot & System Integration : Robotics, Dynamics&Kinetics, Optimal Design, Sensor/Actuator Tech.
- Control : Motion/Vibration Control, High Accuracy Control, Thermal Compensation Algorithm
- Optics & Inspection : Precision Optical System Design, Image Processing Algorithm  
2D/3D Image based Measurement, X-ray Computed Tomography
- Software : Embedded System Programming, Intelligent SW Architecture, Real-time OS Programming
- Mold : Injection Mold Design, Molding Technology, Press Die Design/Mold Materials

- **Quality & Reliability**

- Data Analysis & Statistic Analysis, SPC(Statistical Process Control), Data Mining Application, FDC, APC, VMS Logic Development, Advanced Quality System Design, Design For Reliability, Measuring Sensor Development, Monitoring Method/Tool Development

- **Automation**

- FMS(Flexible Manufacturing System), Automation System Simulation, Conveying System Design, Manufacturing Line Layout Design, Manufacturing System Analysis/Assessment/Design, Automod(Simulation SW) Skills



## Infra Technology Center

► **Business Field** : Manufacturing System, Facility Planning / Operating (Electric Power, Water, Gas, Chemical, Green Technology, Clean Room), system Technology(SCM, PLM, EES, MOS, YMS, MIS, MSS, MES, APC)

► **Major Technology**

- **Materials** : Fab Material Development Technology(Material Design / Quality / Analysis and Optimization Technology / Optimization of Fabrication Process Application Material)
- **Control of Environmental Contamination** : (Clean Room Pollution Control), Control of Contaminated Headwater originated from Fabrication Process(Productivity Enhancement of Mass Production Facility / Improvement of Fault, FOUM / EREM Pollution Control)
- **Facility Technology** : Utility System Design, Electrical System Design, Electrical System Design, C / R Design, Gas / Chemical, Atmosphere / Energy Technology, Water Treatment Control
- **S / W** : SE, SQA, Firmware



## Manufacturing Technology Center

► **Business Field** : Thin-Film Process, Inspection/Signal Process, Robot, Manufacturing Optimization S/W Technology

► **Major Technology**

- **Fab** : ArF/EUV Photolithography Design/Diagnostics Technology, Plasma Technology, RF Matching Network Technology, Ultra/High vacuum Chamber Design Technology, Real-time Process Monitoring Technology, Process Equipment Control S/W
- **Device Packaging** : High rigidity/High-precision, High accuracy align algorithm, Thermal compensation algorithm, vibration control algorithm, Thin-wafer/die Handling Technology, Multi-chip stack mounting/bonding Technology
- **Diagnostic S/W** : Database Technology (DB design & optimization), Data Mining Algorithm, Optimization algorithm, Statistical Analysis, Information Visualization, Web Programming, Sensor Technology
- **Signal Processing & Test** : High-speed Circuit Design, ATE(Automatic Test Equipment) System Design, DFT(Design for Test)
- **Power System & Control** : Power Electronics, Electrification
- **Patterning** : Printable Electronics, Inkjet Printing, Nano Imprinting, Roll Printing
- **Precision Mechanism & Stage** : Precise Moving Element Design
- **Materials** : Inkjet material, Printing material
- **Optics** : Precision Optical System Simulation, Lens Design considering Assembling and Testing, Development of Assembling Process/Optical Testing Process
- **CAE Analysis** : MCAE (Structure/Dynamics/Thermal/Fluid Analysis/CFD),
- **Inspection** : Image Processing Algorithms, Optical Design for 2D/3D Image based Measurement, Electron Beam based Inspection & Metrology
- **Control & S/W** : Motion Control, Vibration Control, Sensor & Actuator Technology
- **Robot System** : Robotics, Manipulator/Wheel Mechanism, Optimal Design, Dynamics & Kinematics, Vibration Control, Robot Vision(Visual Servoing, Object tracking), Intelligent SW Architecture, Embedded System, RT O/S System Programming, Motion Control, Sensor & Actuator Technology
- **Manufacturing System Optimization** : Factory Layout Simulation/Analysis/Design, Factory Operation Analysis/Optimization, Scheduling & Dispatching Algorithm, S/W Architecture Design Technology, Process Design & Evaluation Technology, Automatic transfer system, Industrial Network applied Technology, Embedded System Technology (Firmware, H/W)