Mechanical System Design Portfolio

Kwangwon (Andy) Lee

Mechanical Design Lead • Medical Devices • Electro-Mechanical System Architecture • DFM/DFA

2026

At a Glance

1M+

Units Deployed

Built production-ready architectures used in 1M+ units

30%

Cost Reduction

Manufacturing cost reduction via injection molding transition

20%

Downtime Cut

20% downtime reduction + 15% performance improvement (FMEA-driven)

High-Density Electromechanical System Integration

SolidWorks • Creo (Pro/E) • Siemens NX • Tolerance stack-up • Tooling validation
PCB-to-Enclosure Integration • ECAD–MCAD Coordination

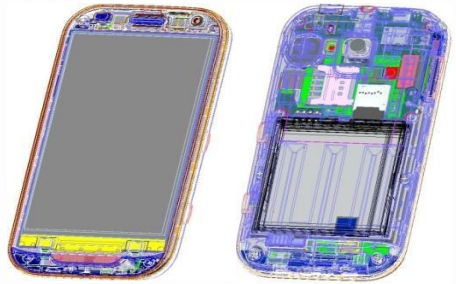
Career Timeline

2003–2004

Shell Line Co.

Mechanical Engineer

Swivel hinge & PCB-integrated cable architecture; passed long-term lifecycle testing



2004–2015

Pantech Co.

Mechanical Design Lead

Led mechanical design across 15+ programs, including slider and flip hinge mechanisms; 200k–1M+ units/model

2015–2018

Winnerswon Co.

Founder / Director

Founded engineering consultancy; concept → prototype → production

2019–Present

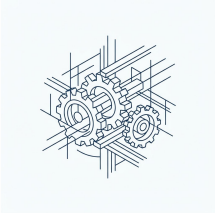
Alentic Inc.

Product Design Lead

Owned mechanical architecture and key design decisions under ISO 13485, from concept through manufacturing readiness

End-to-end product development excellence spanning two decades

Core Competencies



Design & Architecture

- Product Dev & R&D
- System Integration
- Electromechanical Prototyping
- Precision hinge and linkage mechanisms
- PCB-to-Enclosure Integration
- Electromechanical System Architecture
- High-Density Packaging & Layout Coordination

Manufacturing & DFM

- Injection Molding
- DFM/DFA & Tolerances
- Tooling Validation
- Cost Reduction

Quality & Controls

- ISO 13485 Controls
- Reliability Validation
- Failure Analysis
- Regulatory Compliance

Case Study: Alentic

Alentic Microscience

Portable CBC Microscopy Diagnostic System

Problem

Need for a cost-effective, reliable portable diagnostic system with manufacturable design.

Action

Owned system-level architecture including PCB mounting strategy, hinge mechanism, grounding features, and interface validation under ISO 13485 controls.

Result

- **30% Cost Reduction** (Molding conversion)
- **20% Less Downtime** (Optimization)
- **Rapid Response** (COVID-19 Kit)

Case Study: Pantech

Pantech Smartphones

High-Volume Consumer Electronics

Problem

High-volume launch challenges with strict reliability and tight packaging constraints.

Action

Led system-level architecture integrating PCB layout constraints, antenna zones, tolerance stack-up, and high-volume manufacturing validation.
Ensured mechanical and PCB architecture alignment during layout phase to mitigate packaging and signal risks.

Result

- Led **15+ programs** successfully
- Delivered **200k–1M+ units/model**
- **Best Engineer Award** (2011)

Pantech Product Design Process

01. Concept

Planning & Architecture

02. Layout

High-density Packaging

03. Detail Design

Mechanism Integration & PCB Architecture Alignment

04. DFM/DFA

Molding & Die-casting

05. Validation

Tolerance & Reliability

06. Ramp-up

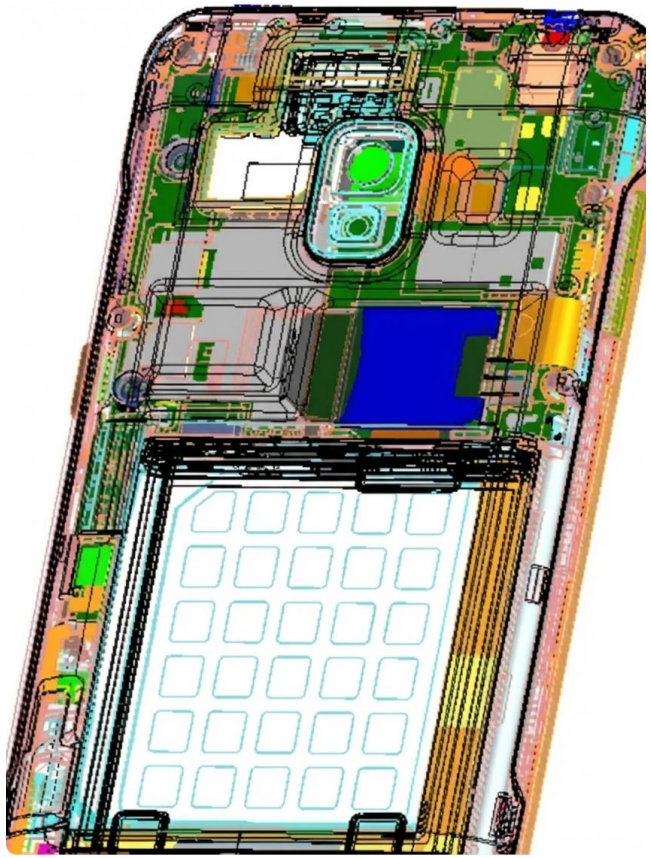
Yield & Production

From concept to stable mass production.

Design Visuals

PCB Integration • Routing Constraints • Packaging Density

Exploded Assembly



Internal Architecture

Early Mobile Device

Thank You

Interested in roles where system-level electromechanical architecture decisions drive reliability, manufacturability, and scalable production.

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