

CASE STUDY

RAPID CO-INVENTION OF HUMANOID MOTION SYSTEMS WITH FOXCONN



CONTEXT

Foxconn is preparing to be the manufacturing partner of choice for humanoid robotics. A core objective of this work was to demonstrate Foxconn's ability to integrate complex subsystems quickly by working effectively with its supplier ecosystem.

The program was aligned to a fixed external milestone: demonstration at Foxconn Technology Day, alongside multiple technology partners. Success depended on speed, integration quality, and credibility — not extended development cycles.

CO-INVENTION CHALLENGE

At project start, several elements were uncertain:

- Actuator architecture suitable for humanoid joint applications
- Force, torque, and dynamic performance within tight space constraints
- Mechanical and control integration at joint level
- Thermal behaviour and repeatability
- Suitability for future production scale

These issues had to be resolved fast. There was no time for full upfront definition or sequential development, with delivery required in under four months.

APPROACH

Foxconn and ANCA Motion structured the engagement as a short, tightly bounded coinvention phase focused on rapid prototyping and integration. The objective was clear: deliver a working, integrated motion system in time for Technology Day.

ANCA Motion's integrated capability across motion control, drives, firmware, software, and system integration allowed architectural decisions and trade-offs to be made quickly. Direct collaboration enabled fast iteration, early resolution of integration issues, and steady progress against an aggressive schedule.

SOLUTION

The collaboration delivered a compact, high-torque, servo-driven motion system suitable for humanoid joint integration. ANCA Motion control hardware, drives, and firmware were combined with a purpose-designed actuator architecture to achieve stable, precise force and position control within a constrained mechanical envelope.

Design decisions prioritised integration simplicity and repeatability, ensuring the solution was credible as a manufacturing building block rather than a one-off demonstration.

VALIDATION & OUTCOME

A working system was delivered and successfully demonstrated at Foxconn Technology Day, alongside solutions from other ecosystem partners. The complete engagement — from initial scoping to public demonstration — was executed in less than four months.

For Foxconn, the demonstration provided tangible proof of its ability to mobilise partners and deliver integrated humanoid subsystems at speed, reinforcing its position as a future manufacturing partner of choice. For ANCA Motion, it demonstrated the ability to co-invent and deliver integrated motion solutions rapidly under demanding technical and schedule constraints.

