Our Motion and Control Engineering Experience

[1]The industry always welcome, and look forward to innovation for the most powerful, most versatile and, if we measure cost in terms of throughput, the most cost effective motion controller solutions. From grinding the corrective lenses for the Hubbell Deep Space Telescope with the sub-nanometer resolution, to moving the 90% full scale replica of the Titanic for the blockbuster movie, to operating the world's fastest pick-and-place machines, to the more commonplace application of precision motion control in machine tools, assembly lines and process production lines, Next Generation Technology in motion controllers can effectively put to work, improving quality, increasing productivity and lowering costs per part. Products made from such advanced technologies play an important role in virtually everyone's life every day.

At Entiv we also believe that open and real-time data base software as a core technology component, when combined with device's embedded real-time object oriented software, will provide the ability to gather and broadcast machine data throughout the manufacturing enterprise via the Internet. Access to machine data that can be pushed across a factory Intranet or the Internet gives the OEM the opportunity to offer additional services such as online support, online engineering, and remote machine and process diagnostics to their customers. This also demonstrates our belief that the future of manufacturing industries lies with open-architecture software and the integration of third-party technologies utilizing advanced motion control components.

At Entiv we are carefully evaluating all trends, competition, target market, future market, and design tradeoff issues, so that we can deliver the next generation world class motion control chip set, developer kit, and reference designs.

[1] ***Entiv Data Systems, Inc.*** ***www.entiv.com***

Papers, Research and Development, Reports, Studies, and Project Contribution:

- [2]Software Architecture for Motion Controls: An advanced open architecture for a critical low end machine controller, providing Quantum leap in the power of the low-end controller along the three dimensions of performance, capability, and abstraction.
- Next Generation Controller: A specification for an Open System Architecture Standard.
- Intelligent Task Automation: Advanced servo control algorithm, task planning, path planning, and vision.
- Automated Decision Making and Development.
- Motion Control Conceptual Design document to stimulate the development of a world-class machine control systems.
- The use of Microprocessors in motion control.
- Motion Control Processors of the 90s- RISC and DSP Technology.
- DSP chips in coordinated multi-axis servo control.
- Motion Control Open Architecture Real-time Considerations.
- Variable Resolution, Monolithic Resolver-to-Digital Converter.
- Optimization of Position Sensor.
- Advanced Motion Control Chipset developer environment.
- Windows based servo design kits.
- The four level of Robot Programming Environment.
- Next Generation Workstation/Machine Controller (NGC) Technology Forecast and Analysis.

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High Level Category of Applications in Motion Control, and Control Systems:

- [3]CNC based multi-axes metal cutting machines
- Manufacturing cell automation and monitoring
- CNC based multi-axes composite tape placement, and winding machines
- Ultra Violate exposure machines
- Solid State image sensing systems
- Temperature, and pressure monitoring and controlling systems
- Emission monitoring and controlling systems
- Precision pick and place robotic systems
- Precision Wafer Handling Systems
- Biomedical fluid dispenser systems
- High density semiconductor etch cluster tool systems
- Printer system, engine, and internal
- Airborne avionic wireless Ground link data recording, transmission systems
- Airborne Communication Management Unit

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Motion Control System, Servo Design Experience:

- [4]Computer Numerical Control System consist if standard 16 bits mini computer running the application programs coupled with special printed circuit cards responsible for closing position and velocity loops (servo system). The servo system designed was the phase-analog type.
- Developed the mathematical model of electromechanical dynamics of a 3-axes milling machine. The model described the relationship between a command voltage signal and the table position (called the transfer function). This transfer function was obtained by measuring the frequency response of each axis utilizing HP3562A dynamic signal analyzer.
- Developed several plant models in particular DC servo motors
- Digital compensator design based on analog prototype carried out in the S-plane, Z-domain, and state-variable methods.
- Tradeoffs in the selection of analog versus digital controllers
- Control algorithms such as PID, deadbeat, state models, observer models, etc.
- Implementation of PID controllers utilizing Motorola DSP56000/DSP56001 family
- Designed linear circuits for motor control applications
- Contributed toward development of advanced motion control technologies to support linear servo motors, and magnetic bearing systems
- Evaluated the benefits of advanced brushless motor, advanced step motor Control chipset
- Fully experienced with Motion Control Technology leaders such as Delta Tau., Galil, PMD, and others.

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