

A Big Step Forward in Mechatronics

The acquisition of Ansoft expands the breadth of multiphysics capabilities from ANSYS and gives engineers a powerful range of simulation tools for systems, blending together mechanical and electronics designs.

Mechatronics-based products combine mechanical assemblies with electronics, intelligent control systems, electromagnetics and electromechanical components. They are all around us — and growing exponentially. Electronics-based hand-held products, unheard of years ago, are now commonplace, and traditionally all-mechanical products such as cars, planes, toys and appliances now have increasing levels of electronic circuitry.

One formidable barrier in developing these mechatronics systems is that mechanical and electronics development processes are usually not performed in an integrated manner. Mechanical computer-aided design (MCAD) and electronic design automation (EDA) systems typically are incompatible and do not exchange data smoothly. These different disciplines often work independently — risking problems downstream when subsystems are pieced together, resulting in missed opportunities to collaborate in optimizing the system's overall multiphysics performance. In development of a stealth fighter aircraft, for example, designing the exterior shape of the plane to minimize reflection of electromagnetic waves from ground radar may not result in optimal aerodynamics and might limit options for designing the landing gear or weapon delivery systems.

A big step forward in bringing together these otherwise separate physics was taken recently with the ANSYS, Inc. acquisition of Ansoft Corporation — a provider of EDA software and simulation tools for electromagnetics, electromechanical, circuit and electronic systems. For more on this important development, see the industry spotlight section in this issue for a history of Ansoft, a lineup of software products, the synergy of the two companies' solutions, and case studies showing how companies put these technologies to work.

This entry of ANSYS into the electronic design software industry broadens the company's range of simulation solutions. Furthermore, adding Ansoft electromagnetics and electromechanical functionality to ANSYS technologies for structural and fluid dynamics simulations greatly expands the range of multiphysics simulations that can be performed — especially those involving mechatronics.

With these comprehensive multiphysics solutions, electronics engineers can readily evaluate stresses in semiconductor packages and printed circuit boards as well as assess reliability of hand-held devices undergoing shock and vibration. They can study various cooling strategies for electronics and better understand heat flow in high-density packages. All of this can be accomplished while also optimizing the design of radio-frequency and microwave components or studying signal and power integrity of high-performance electronics. The various simulations can be tied together within the ANSYS Workbench framework for a smooth exchange of data between various field solvers and design tools; the information can be linked with ANSYS Engineering Knowledge Manager (EKM) software for managing simulation data.

Such a unified approach, breadth of engineering solutions and depth of multiphysics technologies gives development teams the tools they need in a competitive environment, where the ability to design mechatronics-based systems better and faster will likely be decisive for a growing number of companies in the coming years. ■



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