Distinguished Lecture I [11.00 am - 12.30 pm]

Inertial Navigation System and GPS Technology Trends

Abstract: This presentation presents a roadmap for the development of inertial sensors, the Global Positioning System (GPS), and integrated inertial navigation system (INS/GPS) technology. This roadmap will lead to better than 1-m accuracy, low cost, moving platform navigation in the near future. Such accuracy will enable military and civilian applications which were unthought-of a few years ago.

Distinguished Lecture II [3.00 pm - 5.15 pm]

INS-GPS Integration Architectures and Performance Comparisons

Abstract

An inertial navigation system (INS) exhibits relatively low noise from second to second, but position errors increase with time. In contrast, Global Positioning System (GPS) position errors are relatively noisy from second to second, but exhibit no long-term growth. Using both of these systems together is superior to using either alone. Integrating the information from both sensors results in a navigation system that operates like a drift-free INS. Further benefits can be gained depending on how the information is combined. This presentation will focus on integration architectures including loosely-coupled, tightly-coupled, and deeply-integrated configurations. The advantages and disadvantages of each level of integration will be identified. Examples of current and future systems will be cited.