

From the national Societies: Hydrographic Society Benelux

Integrated Navigation Workshop

On Friday 15th December 2006 the Netherlands Institute of Navigation (NIN), Geo-Info Nederland (GIN) and the Hydrographic Society Benelux branch (HSB) held a workshop on integrated navigation, with emphasis on MEMS (micro-electromechanical systems) technology, hosted by the National Aerospace Laboratory (NLR) in Amsterdam. About 75 people attended the workshop.

In the first presentation Prof. Durk van Willigen of Reelelektronika gave an overview of integrated navigation, discussing methods of integration and aspects such as accuracy, integrity, availability and reliability. He illustrated his talk with his own experiences in the field of car navigation, typically based on low-cost sensors.

Next, Sam Storm van Leeuwen of NLR gave an overview of MEMS technology, ranging from accelerometers to temperature sensors and from gyroscopes to accurate clocks. His presentation also contained a useful overview of MEMS manufacturers and system integrators, including links to their websites.

Christoph Wagner of Analog Devices in his presentation addressed the use of inertial (MEMS) sensors in GPS and navigation technology. Shipping more than one million inertial sensors each week, Analog Devices is a leading international manufacturer of MEMS. Its devices are, for example, used in Nintendo's latest Wii game console.

The presentation by Per Slycke of XSens introduced a number of novel applications for miniature IMUs. Such sensors are not only used for navigation of, for example, miniature Unmanned Aerial Vehicles (UAVs), but also for 3D animation and in the field of augmented reality. Another interesting application was related to biomechanics, where motion is monitored by sixteen miniature inertial trackers attached to a human body.

Huub Robroek from u-blox gave an overview of his company's products and activities. It currently manufactures two million GPS receivers a year and is also active in the field of A-GPS (Assisted GPS) for indoor positioning and GPS and dead reckoning systems, such as for car navigation. This year the company is to introduce a fifty-channel GPS/Galileo receiver. In his presentation Robroek showed results of tracking Galileo's GIOVE-A satellite.

The next presentation, by Brendan Watts of Oxford Technical Solutions, addressed the use of GPS/inertial technology for autonomous vehicle navigation. It is expected that by the year 2015 there will be ten thousand autonomous vehicles, initially only for military applications but later also for commercial use. For such autonomous vehicles it is important the position changes smoothly; positional jumps are undesirable for steering control. Watts also discussed export issues concerning inertial sensors, in particular accelerometers. The company uses only sensors for which no export licence is required.

Leen van der Kuylen of Septentrio gave the final presentation. Septentrio is looking into the possibility of combining its high-grade GNSS equipment with low-cost MEMS technology, mainly to bridge GNSS outages or periods of poor geometry in land, marine and air applications. The speaker showed how use of low-cost MEMS technology significantly improved position availability as compared to GPS only.

Copies of all presentations may be found on the NIN website at www.navnin.nl.