

Inertial Sensors and Systems – Symposium Gyro Technology 2014

Programme Committee: W. Bernard (Chairman), W. Auch, W. Geiger, E. von Hinüber, J.-F. Wagner, S. Zimmermann

PROGRAMME

Tuesday, September 16, 2014

08:00 Registration

09:00 Welcome

Session 1: Accelerometers (CHAIRMAN: S. Zimmermann)

09:20 **Tactical Grade Accelerometer Based on Quartz Vibrating MEMS**

T. Lore, G. Hardy, C. Vallée, V. Demutrecy, T. Kerrien, S. Chochain, D. Boutoille
(iXBlue, Lannion, FRANCE)

09:50 **High Performance MEMS Accelerometer**

Alan Malvern, Paul Collins
(UTC Aerospace Systems, Plymouth, UNITED KINGDOM)

Session 2: MEMS Gyroscopes (CHAIRMAN: W. Geiger)

10:20 **Ultra-Small, Digital 3-axis MEMS Gyroscope with Single Drive Mode**

D. Radović¹, T. Balslin², A. Buhmann², M. Dietrich², C. Geckeler², A. Grosse²,
F. Kult¹, O. Lauer¹, S. Lotterer², T. Mayer², T. Ohms¹, G. Trenkle², H-P. Waible¹, O. Kohn¹
(¹Bosch Sensortec GmbH, Reutlingen / Kusterdingen, GERMANY
²Robert Bosch GmbH, Reutlingen, GERMANY)

10:50 Break

11:20 **Self-Calibrated MEMS Gyroscope with AM/FM Operational Modes,
Dynamic Range of 180 dB, and In-run Bias Stability of 0.1 deg/hr**

Sergei A. Zotov, Brenton R. Simon, Igor P. Prikhodko, Alexander A. Trusov, Andrei M. Shkel
(MicroSystems Laboratory, University of California, Irvine, CA, USA)

11:50 **Use of Complementary Sensors in the Development of High Performance MEMS IMUs**

Ben Ferry, Steve Clarke, Paul Collins
(Silicon Sensing Systems Ltd., Plymouth, UNITED KINGDOM)

12:20 **Record and Playback of Inertial Signals for In-the-Loop Testing of Location Based Services**

Ina Partzsch¹, Georg Förster¹, Oliver Michler²
(¹Fraunhofer Institute for Transportation and Infrastructure Systems IVI
²Technische Universität Dresden, GERMANY)

12:50 Lunch Break

Session 3: Vibrating Gyroscopes (CHAIRMAN: E. von Hinüber)

14:00 **Low Cost CVG for High-grade and Commercial North-Finders and Targeting Systems**

J. Beitia, C. Fell, P. Sweeney, I. Okon, D. Simonenko
(INNALABS Ltd., Blanchardstown, Dublin 15, IRELAND)

14:30 **Sagem Coriolis Vibrating Gyros : a Vision Realized**

G. Remillieux, F. Delhayé
(Sagem Défense Sécurité, Boulogne-Billancourt, FRANCE)

15:00 Break

Session 4: Fiber Optic Gyroscopes (CHAIRMAN: M. Perlmutter)

15:30 **High-precision Fiber Optical Gyro with Extended Dynamical Range**

Yu. Korkishko, V. Fedorov, V. Prilutskii, V. Ponomarev, I. Morv, D. Obuhovich, S. Prilutskii
(SIA "Fiber Optical solution" (FOS), Riga, LATVIA)

16:00 **A Simple Optical Technique to Compensate for Excess RIN in a Fiber-Optic Gyroscope**

F. Guattari, s. Chouvin, C. Molucon, H. Lefèvre
(iXBlue, Marly le Roi, FRANCE)

Alternate: Versatile Land Navigation Using Inertial Sensors and Odometry:

Self-calibration, In-motion Alignment and Positioning
Yuanxin Wu (Central South University, Changsha, CHINA)

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Wednesday, September 17, 2014

- Session 5: Test of Components and Systems (CHAIRMAN: D. Lukianov)**
- 09:00 **Inertial Laboratory simulation**
C. Blum¹, B. Braun¹, J. Dambeck¹, M. Kägi²
¹Institute of Flight System Dynamics (TUM), Garching bei München, GERMANY
²Acutronic Switzerland Ltd., Bubikon, SWITZERLAND)
- 09:30 **Application of Non-Planar Four-Mode Differential Ring Laser Gyroscope In High-Performance Dynamic Angle Measurement**
Xin Fu, Jingxian Wang, Linfeng Chen
(AVIC Xi'an Flight Automatic Control Research Institution, Xi'an, Shaanxi, CHINA)
- 10:00 **Simulation Tool Chain for Multi-Sensor Navigation Filters**
T. Martin, U. Probst, H. Fischer, J. Straub-Kalthoff, U. Herberth
(Northrop Grumman LITEF, Freiburg, GERMANY)
- 10:30 Break
- Session 6: FOG Error Modeling (CHAIRMAN: W. Auch)**
- 11:00 **Investigation on Azimuth effect of FOG INS Multi-position Alignment in Magnetic Field**
Ren Lei^{1,2}, DU Jian-bang^{1,2}, HAN Li-jun¹
¹Beijing Aerospace Automatic Control Institute
²National Key Laboratory of Science and Technology on Aerospace Intelligent Control, Beijing, CHINA)
- 11:30 **Inertial Optical System for Railway Track Diagnostics**
A. Boronachin, Yu. Filatov, G. Zuzev, D. Larionov, L. Podgornaya, E. Bokham, R. Shalymov
(St. Petersburg State Electrotechnical University "LETI", St. Petersburg, RUSSIA
ZG Optique SA, St-Aubin, SWITZERLAND)
- 12:00 Lunch Break
- Session 7: Indoor Navigation (CHAIRMAN: T. Löffler)**
- 14:00 **INS/FMCW Radar Integrated Local Positioning System**
B. Al-Qudsi, E. Edwan, N. Joram and F. Ellinger
(Technische Universität Dresden, Dresden, GERMANY)
- 14:30 **LIDAR/MEMS IMU Integrated Navigation (SLAM) Method for a small UVA in Indoor Enviroments**
Rongbing Li, Jianye Liu, Ling Zhang, Yijun Hang
(Navigation Research Center, Nanjing University of Aeronautics and Astronautics, Nanjing, CHINA)
- 15:00 Break
- Session 8: Applications (CHAIRMAN: J.-F. Wagner)**
- 15:30 **Cooperative Navigation and Localization for Unmanned Surface Vessel With Low-cost sensors**
Bo Xu, Jinlei Bai, Guo chen Wang, Zhuo Zhang
(College of Automation, Harbin Engineering University, Harbin, CHINA)
- 16:00 **Performance analysis of an Inertial Navigation algorithm with DVL Auto-Calibration for Underwater Vehicle**
A. Rossi, M. Pasquali, M. Pastore
(GEM Elettronica, San Benedetto del Tronto (AP), ITALY)
- 16:30 **Simplified Orientation Determination in Skijumping using Inertial Sensor Data**
B. H. Groh¹, N. Weeger¹, F. Warschun², M. N. Streicher², B. M. Eskofier¹
¹Digital Sports Group, Pattern Recognition Lab, Friedrich-Alexander University of Erlangen-Nürnberg, Erlangen
²ST Sportservice GmbH, Leipzig, GERMANY)
- Alternate:** **A Polarisation Maintaining Fiber Optimized for High Temperature Gyroscopes and Application**
A. Gillooly, J. Hankey, T. Hart
(Fibercore House, Southampton Science Park, Hampshire, UNITED KINGDOM)