

Call for Papers now open for the 2nd CANEUS Fly-by-Wireless Workshop

Follow-up from CANEUS 2009 Held at NASA Ames

VISION

To minimize cables and connectors across the aerospace industry by providing reliable, lower cost, higher performance alternatives for a vehicle/program's life cycle.

PREAMBLE

The 2nd CANEUS Fly-by-Wireless (FBW) Workshop Program will build on: (a) the vision, mission and goal defined at the [1st CANEUS/NASA Fly-by-Wireless Workshop held in March 2007](#) and (b) focus projects that were proposed and formulated at the Fly-By-Wireless Sector Consortium sessions held at [CANEUS 2009 workshop at NASA Ames on March 1-6, 2009](#). The goal of the CANEUS 2009 Workshops was to significantly advance each of the CANEUS Sector Consortia by creating their roadmaps and articulating well-defined projects for the aerospace industry.

One of the projects defined at the NASA Ames Workshop deals with wireless implementation for structural health monitoring of the main fuselage. By

focusing on an application that is comprised of a complete system solution with a well defined scope and that is supported by all the stake holders i.e. customer, end user, systems integrator and technology provider, participants have the opportunity to build on the past technology planning and development efforts of the Aerospace community. In this way, the activities of the workshop will build on the current technology roadmaps (such as [DPHM Canada](#) and from international agencies) and the existing portfolio of technology developments, thus allowing the participants to concentrate their efforts on the technology gaps that need to be filled in order to realize a commercially viable system solution.

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OBJECTIVES

The upcoming 2nd Fly-by-Wireless workshop aims: (a) to refine the focus projects and pertinent details, identify specific development needs, outline teaming and funding schemes, plan project oversight and execution, and establish milestones from which to gauge success of the projects, and (b) stimulate formation of project teams comprised of technology providers and application/end users and project proposals from each team that have significant mutual benefit and high potential of funding from internal or external organizations.

Major topics of interest include:

- Sensor DAQ Micro-Miniaturization
- Passive Wireless Sensor Tag
- Less-Wire Architectures
- Structural Health Monitoring
- Wireless systems immunity in Electromagnetic Environment (HIRF, Lightning etc)

SCOPE

In order to accomplish the ambitious goals of this 2nd Fly-by-Wireless workshop, the program has been structured in four parts:

I. Case for CANEUS Fly-by-Wireless Sector Consortia:

The plenary session outlines the mission, vision, and goals of the CANEUS Fly-by-Wireless Consortium as well as presentations from visionaries from Canada, USA, Europe, and elsewhere to minimize cables and connectors across the aerospace industry. The first half-day of the Workshops will provide participants with the *raison d'être* of FBW consortia and the CANEUS approach to implementing its goals. This plenary session will also address the key challenges faced in working on collaborative high-risk, high-cost projects. Issues to be addressed include ITAR, intellectual property, non-disclosure agreements, and funding.

II. Sessions Covering End-User Needs and Technology Developers Gap:

The goal of the subsequent Sessions and the presentations from world-class Experts, including those selected from the abstracts received in response to the call for papers, is to update participants on the needs and lessons learned of the aerospace (aeronautics, space and Defence) industries including the basis for the business case, as well, all aspects of fly-by-wireless technologies: the state-of-the-art in developments related to FBW, challenges, applications and to identify the technology gaps.

Application End-Users Categories:

- Aircraft – Manned and Unmanned
- Helicopters and spacecraft landing vehicles
- Spacecraft
- Launch Vehicles
- Jet Engines and Rockets (hot and cold sections)
- Flight Test Programs
- Aerospace Vehicle Ground Support Systems/ Drag-on equipment & Tools
- Human/Robotic Systems – crew, passengers, customers
- Infrastructure changes – Spectrum, Certification

Technology Developers Categories:

Wireless and Less-Wire Sensing

- Wireless no-power sensors/sensor-tags
- Standalone, robust wireless data acquisition
- Scavenge and Rechargeable power sources
- RFID tags for ID, position, data, & sensing Nano-technology enhancements to Micro-Wireless Sensing
- Harsh Environment wireless sensors

Wireless and Less-Wire Avionics

- Robust Programmable wireless radios
- Wireless controls – back-up or low criticality
- Robust high speed wireless avionics communications

Enabling Architectures

- Multi-drop bus-based systems
- Data on power lines
- No connectors for avionics power
- Standard interfaces & operability for Hardware, Software and RF
- Light weight coatings, shielding and connectors

Technology Alternatives to Cables and Connectors:

- Standalone Wireless DAQ and active sensor tags
- No-power RFID and passive sensor tags – direct access to sensors with no battery or cables at a short distance
- Robust/adaptive radios adjust characteristics to optimize RF communications
- Lightweight coatings/shieldings for EMI/EMC and avoid RF Interference
- Flight test instrumentation
- When finding different frequencies, we need to ensure that these are not interfering with existing frequencies being used

III. The Consortia Project Development, Implementation and Success Criteria:

These sessions are the heart of this 2nd FBW workshop. We are endeavouring to create a program that optimizes the use of participant time to produce measurable deliverables to advance the goals and activities of each of the existing well-defined projects as well identify new projects with strong business case.

Topics covered in the sessions from the second part of the workshop will feed into this third part of the workshops: participants will apply the knowledge acquired during the sessions towards formulating and implementing existing as well new projects. Finally, as a measure of the workshop success, each project team will present the findings and outcome to gauge project completion and milestone achievements, and the avenues to be pursued to overcome challenges such as intellectual property, funding, and government regulations (such as ITAR).

IV. Workshop Outcome - Projects and Reports:

These sessions aim to summarize the output of each of the existing and proposed Consortia projects. In these sessions, workshop participants will also have the opportunity to learn about the implementation plan and nominate new leaders for the working groups.

SUPPORTING ACTIVITIES AND RESOURCES

a. Technical / Industrial Exhibits:

There are limited exhibit spaces that would allow large and small industries and universities / research laboratories to showcase their capabilities: both hardware and other demos. These displays will also contribute towards the projects presented during the workshop sessions. To encourage maximum participation, the Planning Committee has allocated maximum 5 exhibit spaces for each project.

b. Industrial Visits:

Proposed Technical tours to following industrial facilities will showcase a cross-section of practical solutions relevant to the projects being addressed in the Workshops. The tours are scheduled for the last day of the workshop.

1. Bombardier Aircraft Manufacturer
2. Canadian Space Agency
3. Aerospace Manufacturing Technology Centre of the National Research Council of Canada
4. Pratt & Whitney Engine Manufacturer
5. CAE Electronics Simulator
6. Thales Avionics

c. Handbook for Project Development, Background Papers and Facilitators

For the workshop participants, we have prepared a Sector Consortia handbook that will help participants guide through the various stages of the project preparations. There are many additional background papers that are being commissioned to help provide participants requisite background with the various topics of the interest.

Furthermore, throughout the week's activities, you will be given extra documents and notes to add to the Handbook manual in order to supply you with the tools needed to participate in all the planning processes. Please make a special effort to keep your Handbook up-to-date by adding documents and presentation notes. Doing so will enable you to maximize the benefits from this workshop. By the last workshop session, this document is expected to be complete and an accessible, take-home guide for the entire workshop.

ABSTRACT SUBMISSION

Presentations for this workshop should be strongly influenced by the participant's personal perception of what is necessary to realize the needs and requirements of the Fly-By- Wireless Consortium focus project. Whether you are a customer, end user, technology provider, or set policy, determine the capability or technical contribution that you think best address the challenges of the focus project.

Abstracts of presentation should be uploaded at the workshop site:

www.caneus.org/fbw/uploads/

Abstracts including figures should not exceed two pages in length. Acceptable formats are Adobe PDF and MSWord. The abstract should include authors name and affiliation, telephone and e-mail contact information for the pri-

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mary author. Presenters should ensure that they have requisite approval from their organization. Presentations will be selected based on their technical merit and suitability with the defined scope and goals of this workshop.

PRESENTATION AND PUBLICATION

The official workshop language for the workshop will be English. Speaker will be provided with a presentation template and guidelines to prepare their presentations. This will ensure consistency with all presentations. Each speaker will be allotted 20 minutes for presentation and 10 minutes for questions and discussion.

MEMBERS

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IMPORTANT DATES

Abstract Submission:

May 11, 2009

Final Presentation in Requisite Format:

May 25, 2009

All workshop presentations will be made available on the website with secured password. Authors are also encouraged to submit full paper for subsequent potential publication issue of the IEEE Aerospace and Electronic Systems Society.

POSTER SESSIONS

Poster sessions featuring presentations from universities, research laboratories, SME's and end-users complement the topics covered in the sessions.

STUDENT PAPERS AND AWARD

Papers are also solicited in any of the above areas from graduate and undergraduate students. Students must indicate their status and affiliation. The top 3 entries will receive first prize of \$1,000 and two prizes of \$500 each.

HOST AND SUPPORTING ORGANIZATIONS

CANEUS International

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