JACIC Status and Acknowledgments

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This is the end of the first year of publication of the *Journal of Aerospace Computing, Information, and Communication* (*JACIC*). It remains an exciting and important endeavor. Aerospace systems are key elements of the information age, and *JACIC* was created to document those efforts. I'm proud of the progress we have made on *JACIC*, and the credit goes to a wide variety of people: authors, reviewers, associate editors, AIAA staff, and more.

We expect the scope of *JACIC* to evolve over time, but currently it is:

This journal is devoted to the applied science and engineering of aerospace computing, information, and communications. Original archival research papers are sought which include significant scientific and technical knowledge and concepts. The Journal publishes qualified papers in areas such as real-time systems, computational techniques, embedded systems, communication systems, networking, software engineering, software reliability, systems engineering, signal processing, data fusion, computer architecture, high-performance computing systems and software, expert systems, sensor systems, intelligent systems, and human-computer interfaces. Articles are sought which demonstrate the application of recent research in computing, information, and communications technology to a wide range of practical aerospace engineering problems.

Starting a new journal is a difficult task, but we have managed to attract a large number of high-quality papers. This has certainly been helped by the excellent reputation of AIAA publications combined with the importance of information-enabled aerospace systems. For the first year we had 163 papers submitted. Of these papers, 38% were accepted for publication, 34% were declined, and 28% are still under review.

I have been asked many times what sort of papers we publish in *JACIC*. Aerospace engineering is an inherently interdisciplinary field, and authors often discuss multiple technologies or topics in their papers. The key to deciding whether a paper is appropriate for *JACIC* is to determine the main focus of the paper. If the focus is computers, computation, information, communication, software, or IT, then it probably fits in *JACIC*. On the other hand, if the focus of the paper is on control with some discussion of computing, then it probably fits best in the *Journal of Guidance, Control, and Dynamics*. Similar guidelines would apply to the other AIAA journals.

Many of the topics covered by *JACIC* are relatively new, and the terminology continues to evolve, but "computing, information, and communication" (CIC) do represent the key technologies. Aerospace information technology (IT) is also a common term, but information-enabled aerospace systems might be even more descriptive of *JACIC* content and current trends in aerospace. Every year aircraft and spacecraft rely more and more on computers and software. You may also notice how often the word system appears in the scope. This is indicative of aerospace vehicles: they are systems. Few aircraft, spacecraft, or ground vehicles operate alone however, which leads us to also consider systems of systems.

It is encouraging to see a number of university aerospace engineering programs moving to educate students in all aspects of information-enabled aerospace systems. In addition to aerodynamics, propulsion, dynamics/control, and structures, students need to learn about aerospace IT. Together these subjects represent the five "pillars" of aerospace engineering, as I wrote about last year at this time. Students also need to understand the design process and systems engineering, which tie the five pillars together.

This is a difficult transition for many aerospace engineers, but it must be recognized that the original four technical areas of aerospace engineering are fairly mature compared to information technology. Computer capability is improving exponentially. We are only beginning to understand the implications that this will have for aircraft and spacecraft, especially unmanned systems. For aerospace engineers to remain relevant, they need to understand computer systems, information systems, and communication systems. At the Massachusetts Institute of Technology aerodynamics is optional for aerospace engineers, but embedded computer systems are not! At the very least, aerospace engineers need to be able to communicate well with electrical, computer, software, and systems engineers. Hopefully, *JACIC* can have a positive impact in this area. At one point in 2004, Lockheed Martin had 4096 job openings. More than half of these (51%) were in the areas of electrical engineering, information technology,

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software, or systems. There were only 109 openings (2.7%) for aerospace engineers. It is difficult to admit that Lockheed Martin does not need many aerospace engineers. They need people who understand modern complex aerospace systems, most of which is IT related. Boeing is no different, their Web site states: "Today, we expect most of our future revenue to come from the sales of aircraft-related information products and services." On the Raytheon employment Web site openings are listed primarily for electrical, software, and systems engineers. These are the same people *JACIC* was designed to serve.

For any journal it is the Associate Editors (AE) and reviewers that deserve most of the credit. Their time commitment is enormous and they are continually required to make very difficult decisions. I am privileged to have 16 exceptional AEs: Carolina Cruz-Neira, Shlomi Dolev, James F. Hargrave, Albert D. Helfrick, Ellis F. Hitt, Eytan Modiano, Jan Albert Mulder, James C. Neidhoefer, Stanley M. Nissen, Gerard P. Parr, Reinaldo J. Perez, Paul E. Plassmann, Amy R. Pritchett, Christopher L. Rumsey, and Carol A. Traynor. In addition, Ella M. Atkins is our book review associate editor, and we would encourage people to submit book reviews. *JACIC* AEs have worked hard to be fair and to help produce the best journal possible. In addition, many of the AEs wrote editorials in 2004, which describe the state-of-the-art in their area of expertise. These editorials are summarized in Table 1.

Table 1 Editorials Published in 2004

Title	Author	Date Published
Computing, Information, and Communication: The Fifth Pillar of Aerospace Engineering	Lyle N. Long	January 2004
High Performance Computing: Current Issues and Future Challenges	Paul E. Plassmann	March 2004
Communication "Tones" and Their Use as Reliability Assessment Tools in High Risk Aerospace Maneuvers	Ray Perez	April 2004
Web Forums and the Online Journal	Carol Traynor	May 2004
Self Stabilization	Shlomi Dolev	June 2004
Educating the Avionics Professional in the 21st Century	Albert Helfrick	August 2004
Network Centric Operations Impact on Avionics	Ellis Hitt	September 2004
Satellite Data Networks	Eytan Modiano	October 2004
Perspective Guidance Displays Show the Way Ahead	Jan Albert Mulder	November 2004
Intelligence in Aerospace	Intelligent Systems Technical Committee	December 2004

In December 2004, *JACIC* had its first special issue which was devoted to intelligent systems. In assembling this issue, the AIAA Intelligent Systems Technical Committee (TC) demonstrated a level of teamwork that I have seldom seen. They were ably led by James Neidhoefer. This group also put together the very successful AIAA Intelligent Systems Conference in 2004. This was held jointly with the well-known AIAA Unmanned Unlimited Conference. For 2005, the Intelligent Systems TC and the Unmanned Unlimited Committee will combine their efforts, along with the Software Systems TC and the Computer Systems TC, for the 1st Annual InfoTech@Aerospace conference. This new conference will be devoted to all aspects of information-enabled aerospace systems.

One of the things I have been most surprised about is the reluctance of authors to take advantage of the multimedia nature of *JACIC*. We accept a wide range of attachments to the papers (.wmv, .xls, .doc, .ppt, .mdb,

.html, .htm, .gif, .jpg, .jpeg, .mov, .pdf, .txt, .zip, .wav, and .mp3). Graphics, animation, audio, computer codes, data files, etc. all add enormously to the value of archival papers, but authors too often restrict themselves to text documents alone. Often the paper follows a presentation at a conference, where the story is often told using multimedia, but this multimedia is not then attached to the journal paper. In addition, *JACIC* is an archival journal, and we archive all the attachments as well as the paper itself. Some of these attachments could be quite valuable in the future. For example, most government documents are not copyrighted and could be very hard to find years from now. We can attach and archive them in *JACIC*. I will continue to encourage authors to use multimedia in their papers. A good example of the use of multimedia in *JACIC* is the paper by Xu, Accorsi, and Leonard in the July 2004 issue.

The *JACIC* Web site will continue to be improved and enhanced. It is our goal for it to become more of an online community website. There need to be ways (other than e-mail) for members to communicate with each other. At the present time, information only moves in one direction on the *JACIC* Web site (from webmaster to reader). In a rapidly changing field such as IT, information must flow rapidly from authors-to-readers, readers-to-authors, and readers-to-readers. Online communities are now widespread, and are crucial elements of knowledge management. Two features in particular: online discussion forums and easy document exchange would have an enormous impact on readers, and would increase the value of being a *JACIC* subscriber. Online discussion forums would allow people to continue discussions that they start at conferences, as well as allowing discussions about published papers. We also need document exchange, where AIAA members can easily exchange data and documents (e.g. uncopyrighted papers, reports, codes, data, weblinks, and multimedia files). Both the discussion forums and the documents need to be archived and searchable as well. And we need the capability to hyperlink back and forth between all the elements of the Web site. The main focus of *JACIC* is publishing peer-reviewed archival papers, but we need to encourage other interactions as well.

The AIAA rarely starts a new journal, but everyone seemed to think *JACIC* was important. The shift to information-enabled aerospace systems was too dramatic to ignore, and authors needed a place to submit their work. Numerous people worked to make *JACIC* a reality. The AIAA Publications Committee deserves a lot of the credit, along with the two most recent AIAA Vice Presidents for Publications: Roger Simpson and David Dolling. In addition, AIAA's small but dedicated staff has been instrumental in the first year's success. In particular, Norma Brennan, Meredith Cawley, Sean Malone, and John McAndrew have been extremely helpful. Norma is in charge of publications at AIAA and deserves an enormous amount of credit for producing the high-quality AIAA journals. Meredith is the Managing Editor of *JACIC*, and handles most of the difficult day-to-day work, and always in a cheerful manner. Sean and John have been the key technical experts behind the Web-based *JACIC* and WriteTrack™. WriteTrack is a powerful system that has revolutionized the paper submission, review, and publishing processes.

JACIC was created for authors and readers. If your work is at the intersection of aerospace systems with computers, computation, software, communication, or information; then we want to hear from you. Let us know what we can do to publish your work better and faster, and how we can bring you the content that you need. In addition, we could publish a lot more papers than we have, so please submit your papers. You can read *JACIC* at www.aiaa.org/JACIC and you can submit your papers at www.writetrack.net/JACIC. I welcome your comments and suggestions, you can reach me at lnl@psu.edu.