Journal of Aeronautics & Aerospace Engineering

Jarzębowska, J Aeronaut Aerospace Eng 2012, 1:1
DOI: 10.4172/2168-9792.1000e105

Editorial Open Access

Promoting New Research Results by an Open Access Journals – Faster Dissemination of Research Results and More Chance for Feedback to their Authors

Elżbieta Jarzębowska*

Power and Aeronautical Engineering Department, Warsaw University of Technology, Poland

Open access journals become more and more reliable and popular among professionals and beginners like PhD students. As opposed to closed journals, they provide unrestricted and permanent access to scientific publications, may also be included in conventional index and abstract databases. Many Open Access journals also provide rigorous peer review for high quality of publications.

Is the Journal of Aeronautics and Aerospace Engineering a proper one to be open access? The question may seem trivial. I think it is not, if one thinks about its scope and the potential impact of new findings and their dissemination across aerospace and related disciplines, and maybe across fields seemingly not related with aerospace at all.

Specifically, the scope of the Journal of Aeronautics and Aerospace Engineering that addresses various fields of aeronautical sciences, electrical and mechanical engineering, rocket science, aircraft and rocketry, and related domains as control encompasses the leading research that gears new theoretical developments and technologies and opens wider perspectives and new ground for theoretical and applicable results in other scientific areas. The aeronautical science is the source of bold ideas that may influence progress in science and technology.

There are many examples of impacts of aeronautics related research results on other fields of science. One example is from the domain of nonlinear optimal control. Its rapid development in 1950s and 1960s together with algorithms and reliable codes for these algorithms, for calculating nonlinear optimal trajectories for aircraft and spacecraft was forced by practical needs. The well known problem that had to be solved at that time was construction of a spacecraft reentry trajectory. Some of the first numerical solutions for optimal spacecraft trajectory problems were given in 1950s [1,2]. These solutions used the shooting method of guessing initial values of Lagrange multipliers when integrating the Euler-Lagrange equations forward and then interpolating on the multipliers until the final conditions are satisfied. This approach is usually not applicable to aircraft trajectories, i.e. not to non-conservative systems because of the lost of numerical stability. Gradient methods, which were proposed; see e.g. in [3] and references in [4], eliminated the instability problem. According to Bryson [5], one of the first applications of the gradient method to spacecraft and aircraft were made about 1960s. More details about the fascinating development of the nonlinear optimal control under the pressure of the aeronautical research and applications can be found in [5] and references there.

As the result of efforts of many engineers and scientists working for aeronautics, nowadays many disciplines enjoy effective optimal control strategies and algorithms, and continue their developments for their specific needs and applications. They are for example, economy, investment and business sciences, management, manufacturing in the design and operation of production processes, and other engineering and non-engineering areas.

Another example is not so pronouncing, not so spectacular, and related to personal experience of a single researcher. However, I think many of us, researchers, may share this experience. Let me, as a mechanical engineer from an aeronautical department, as a university researcher and teacher, whose research concentrates on dynamics, modeling and nonlinear control, share some example from my own experience.

For some years of my university career, I worked on modeling and control strategies for nonholonomic systems. Traditionally, nonlinear control uses dynamic models based mostly upon Lagrange's equations with multipliers. The scope of applications of these equations is limited, because only first order constraints, material or generated by conservation laws, may be merged into these dynamic models. Requirements for motion that are often specified by equations for controlled systems are not merged into these equations. First order constraints that are adjoined to the equations of motion via the introduction of Lagrange multipliers can also be embedded through the reduction procedure, which avoids the addition of auxiliary variables. To obtain a dynamic control model, a reduction procedure has to be applied to eliminate the multipliers. In some latest monographs one may find some efforts of "leaving the Lagrange equations approach" but no constructive modeling methods and application examples can be found there, see, e.g. [6].

I have generated and suggest to apply for nonlinear control applications the generalized programmed motion equations, which might be derived in various coordinates, e.g., generalized or quasi, and which furnished a unified framework for dynamic modeling systems subjected to nonholonomic equality constraints of arbitrary order [7]. The final application of the framework is the development of a new tracking strategy, which is referred to as the model reference tracking control for programmed motion. It is dedicated to tracking tasks specified by equations of programmed constraints. The strategy provides a unified approach to motion tracking for both holonomic and nonholonomic mechanical systems. The framework and the tracking strategy fit multibody systems, either moving on the ground, in water or flying. So it might be of interest for control, robotic, and maybe aeronautical community. It was my individual research and I expected some feedback, not only next scientific degree.

My results have been published in a couple of recognized, closed

***Corresponding author:** Elżbieta Jarzębowska, Power and Aeronautical Engineering Department, Warsaw University of Technology, Poland, E-mail: elajarz@meil.pw.edu.pl

Received May 16, 2012; **Accepted** May 18, 2012; **Published** May 22, 2012

Citation: Jarzębowska E (2012) Promoting New Research Results by an Open Access Journals – Faster Dissemination of Research Results and More Chance for Feedback to their Authors. J Aeronaut Aerospace Eng 1:e105. doi:10.4172/2168-9792.1000e105

access control journals. First, the only feedback was from the journal reviewers. It was rigorous and challenging but has come from a few researchers only. After about three years, a couple of PhD students asked about copies of my papers and I found a couple of citations that showed up in references of some control related journals. Also, requests for a copy of one of my papers from a couple of well known researchers from the control field have come. Then, there are citations, references, so it may seem it is fine. My work has been noticed, however, me as the author would like to get more than a rigorous peer review and more than see citations in journals. I have presented new results and would be thankful for some feedback. I was looking for papers reporting research in the similar direction and spirit. I believe that many of you acts like that continuing his or her research, and waiting for feedback.

The author would like to know, I believe, whether his or her results have had any impact upon the field or related fields. The author would like to know whether the results are of theoretical and academic meaning or may find applications.

The research work is like adding and putting together brick to brick to build a new building, so every author, I believe, would expect to obtain an unrestricted and permanent access to scientific publications.

Maybe more open access journals are the respond to these expectations. Maybe open access publications that promote cross discipline research share and help the confluence of scientific efforts from various disciplines, are the remedy for getting fast feedback of our own research results.

Maybe an open access journal where all the disciplines come together and share their findings, where researchers may learn from the research of other disciplines, is the solution for getting faster dissemination of research results and a chance for feedback to their authors.

References

1. Bryson AE, Ross SE (1958) Optimum Rocket Trajectories with Aerodynamic Drag. Jet Propulsion.
2. Breakwell JV (1959) The Optimization of Trajectories. SIAM Journal 7: 215-247.
3. Kelly HJ (1960) Gradient Theory and Optimal Flight Path. J Am Roc Soc 30.
4. Balakrishnan AV (1964) Conference on Computing Methods on Optimization Problems, Academic Press, New York.
5. Bryson AE (1996) Optimal Control-1950 to 1985. IEEE Control Systems 16: 26-33.
6. Soltakhanov Sh, Yushkov MPP, Zegzhda SA (2009) Mechanics of nonholonomic systems. Foundation of Engineering Mechanics, Springer, Berlin.
7. Jarzębowska E Model-Based Tracking Control of Nonlinear systems. CRC Press, Taylor and Francis Group, Boca Raton, in press.