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Editorial

Both Interdisciplinary and Interesting

Sometimes all it takes to realize the significance of a thing is simply to understand its name. This is certainly the case for the journal *Integrated Computer-Aided Engineering* (ICAE), which has now been benefitting interdisciplinary researchers for 30 years. The name ICAE starts with "integrated," which speaks to the very interdisciplinary nature of the journal. ICAE is about research projects, not simple research papers. To publish in ICAE is to present research in a larger context, making ICAE articles of interest to researchers and enthusiasts in several technology fields at once.

The second part of ICAE's name is "computer," and some elaboration is necessary here. ICAE papers are not about computer architecture or about computer networks; instead, ICAE is about using computer architectures and networks in optimal ways to solve technical problems.

This comes to the third part of the four-part name: "aided". Computing is used to aid technologists in their research and development challenges. Computing is a tool, and ICAE authors are expected to actually use their tools properly. If it's a nail, you'd better use a hammer, but if it's a screw, you'd better use a screwdriver. If a paper is submitted to ICAE, it had better not simply grab the latest convolutional neural network (CNN) design and apply it to a known data set and present its 2% reduction in error rate as a finding. That is simply a verification that CNN designs continue to incrementally improve, and as such is nothing more than a verification that CNNs continue to be useful tools for the technical community. Reaching back to the earlier analogy, that is tantamount to showing that the latest hammer will pound a nail with 2% more efficiency. Nice to know, but not interesting. Perhaps this is why the third part of the name of ICAE is so important. When one must use a tool to aid in a task, it should be an interesting task. For me, this is why ICAE is one of my favorite journals. It is both interdisciplinary and **interesting**. Incremental articles are not ICAE articles. Hojjat Adeli, the Founder and Editor-in-Chief of ICAE, makes this clear in the reviewer form for ICAE, which specifically asks "*If you are aware of the authors' other recent publications please explain how the current submission is different from their previous publication. Please point out the duplication, if any, and provide specific suggestions to minimize any duplication.*" In other words, any duplication is grounds for constructive, but also restrictive, feedback to the authors. It is computer-aided, not computer-using, research.

This brings us to the fourth part of the name, "engineering." Engineers are applied researchers. They build devices, they test what they build, they create useful and reproducible outputs. We need only consider the next part of the reviewer feedback to see this need for building, testing, and utility: "*Please comment whether examples presented in the paper are appropriate and justified considering the significant advances made in computational modeling in recent years as well as the increasing power of computers. Are the examples presented small academic exercises?*" Sure, ICAE publishes papers from some of the world top academics; after all, that is precisely what its Editor-in-Chief is. However, ICAE requires these folks to build, test, and provide the "engineering blueprints" (that is, the ability to reproduce the results) of their research so the entire ICAE audience can benefit from the engineering insights of the authors.

I am a professor in a Systems Engineering Department, which is a formal engineering discipline focused on integration. For me, the ICAE journal is an important element of staying aligned with the advancements in large, integrated engineering research. I have been a reviewer for ICAE for over a decade (much of that time as a Fellow at HP Labs, and more recently as a Professor at Colorado State University). I joined the Editorial Advisory Board a couple of years ago. ICAE has remained as relevant to me in my new career in academia as it was in my former career in the computing industry.

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Like an old friend, ICAE has been something I could count on as I made a fairly dramatic career transition. ICAE has been as valuable to me in training the next generation of biomedical, mechanical, computer and systems engineers as it was to me in helping lead the current generation. It is a must-read to researchers in industry, academia, and government spheres.

To say ICAE was ahead of its time 30 years ago is trite. Of course it was: just look at how interdisciplinary, or integrated, research has grown since then. A bolder statement is to say that ICAE is still 30 years ahead of its time. Adeli and his Editorial Advisory Board Members require the engineering expectations of its authors to keep pace with the available tools of the engineering trade, forcing them to be continually looking forward. *Computer-aided* means something different every year. A fitness-tracking watch today has more computing power than the huge Cray supercomputer that I used to perform my Master of Science imaging research on more than 30 years ago. So, I expect engineers today to solve a different set of problems, *because they can*. For me, ICAE represents a reality test for engineering research in a special way that very few – if any – other journals do. ICAE is pre-adapted to be *always ahead of its time*. If you can submit an article to ICAE, let alone publish it in its prestigious pages, you are in fact applying the most modern tools of today to your work. You are, rightly proudly, an engineer. You solve problems, and you innovate, create, and differentiate. Here's to the next 30 years of ICAE!

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