

The Human Dimension

“To engineer is human,” declared Henry Petroski (St. Martin’s Press, 1985). JMD is an engineering journal. Therefore, one might think, JMD must be about humans. Is it now? For sure, authors, reviewers and readers are human, as we often have occasion to reflect upon. Well, what about content?

One of my graduate school mentors was the late Professor Ernest Gunther Chilton. Ernie was Stephen Timoshenko’s last Ph.D. student and no technical slouch, but in his later years when I met him his energies were elsewhere: His book *Design: Serving the Needs of Man* (Macmillan, 1974) is an introductory engineering text that I still find relevant today. Ernie might have changed the title a bit, saying “Humans” rather than “Man,” or in these wealthier days he might have said “the Needs and Wants of Mankind.” So I checked a bit and found that the vision statement for ASME states: “ASME will be the essential resource for mechanical engineers and other technical professionals throughout the world for solutions that benefit humankind.” Then I checked a bit more to see what I would find that might explicitly follow this vision. Out of 101,605 ASME online articles, 1827 contained the word “human,” 102 the word “bio,” 78 the word “cognitive,” 37 the words “human factors,” and 4 the word “humankind.” It is an easy game and we can argue about these numbers, like we do about journal citation counting, but the point is, there are few ASME articles relating to the ASME vision explicitly.

I then looked at the purpose and scope of the 26 ASME Transactions Journals. Humans as physical entities are studied, as expected, in the *Journal of Biomechanical Engineering*, the *Journal of Medical Devices*, and a bit in the *Journal of Nanotechnology in Engineering and Medicine*. The *Journal of Energy Resources Technology* states that discussion papers addressing policy or regulatory issues that affect energy resources also fall within its scope. The *Journal of Computing and Information Science in Engineering* has actually more content related to humans but it tends to be hidden in words like internet-aided design, manufacturing and commerce, knowledge-intensive CAD, or creative IT.

Our own JMD appears more explicitly interested in humans beyond their physical instantiations, stating topics like creativity in design and decision analysis, design cognition, integration of

engineering design with market, economic, and aesthetic considerations, or design education. But then, design automation seems to aim at removing the humans from the process altogether.

My perception in my earlier days in the profession was that as we get old or into retirement we get interested in humans because, among other things, we have lost the sharp edge of our thinking and are getting a bit fuzzy—conveniently studying fuzzy humans, in contrast to crisp machines. Yet, in the ensuing years I met many very crisp thinkers studying humans and their behavior individually and collectively. Almost none of them are engineers. This makes sense. Engineers are not educated to study humans, except in some specific circumstances, like human factors or bioengineering. Humans are messy and unpredictable. On the other hand, nature must have appeared just so to early humans. Engineers have used the physical sciences to their advantage to build technologies that do serve humankind. Perhaps engineers must now also use the behavioral and social sciences to build technologies that serve humankind. Indeed, some engineers do just that. They also collaborate with the scientists from these other disciplines to maintain research rigor. I just do not see things happen the other way around: social scientists building machines; although, social networking software comes close.

In many ways, bringing the humans explicitly within design research brings along another level of complexity that many of us would rather avoid. Despite occasional stereotyping, mechanical engineers have been quite open to exploring the human-induced complexity in design—the human dimension of design. Whether we think about humans as designers, humans as users of designed artifacts, collections of humans interacting with technology, or humans as inspirations for design, it is clear to me that mechanical engineers, and JMD, have a role that we must play.

Some good mechanical engineering sense can go a long way toward a more productive and rational discourse in serving the needs, and wants, of humankind.

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