

in the final analysis

“As we care about more of humanity, we’re apt to mistake the harms around us for signs of how low the world has sunk rather than how high our standards have risen.”

—Steven Pinker, *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*

In October 2020, the World Economic Forum convened the Jobs Reset Summit. The thesis of this virtual meeting (is there any other kind of meeting these days?): “After years of growing income inequality, concerns about technology-driven displacement of jobs, and rising societal discord globally, the combined health and economic shocks of 2020 have put economies into freefall, disrupted labour markets, and fully revealed the inadequacies of our social contracts. As we emerge from the crisis, we can proactively shape more inclusive, fair, and sustainable economies, organizations, societies, and workplaces. To do so, we must mobilize the best human capabilities, technologies, innovative policies, and market forces.”

As you might anticipate, driving the reset in jobs are robotics and artificial intelligence (AI). One of the summit participants, Hiroshi Tasaki, honorary professor at the Graduate School of Tama University, wrote that a “serious unemployment issue created by the Fourth Industrial Revolution is the prospect of many workers previously engaged in the knowledge economy losing their jobs to rapidly developing AI.” Let’s define terms: What’s the Fourth Industrial Revolution? Explains Klaus Schwab, founder and executive chairman of World Economic Forum, “The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.”

If you are looking for evidence of the Fourth Industrial Revolution in application, it sounds a lot like what has been occurring within TMS. Consider, for example, our government-funded studies, including the latest—2020’s *Accelerating the Broad Implementation of Verification & Validation in Computational Models of the Mechanics of Materials and Structures*. Our family of studies has helped set some of the parameters for how the Fourth Industrial Revolution is presenting within the materials community.

Within TMS, let’s circle the First World Congress on Artificial Intelligence in Materials and Manufacturing, which will debut April 3–6, 2022, in Pittsburgh, Pennsylvania. It is chaired by Taylor Sparks of the University of Utah and is sponsored, within TMS, by the Materials Processing & Manufacturing Division, the Integrated Computational Materials Engineering Committee, and the new Artificial Intelligence Subcommittee of the Materials Innovation Committee. The new event will include programming on intelligent/robotic manufacturing, machine learning and deep learning, computer vision, autonomous materials research, AI-assisted development of new materials and alloys, human-AI collaboration, and organizational impacts of AI. I’m intrigued.

While these developments in AI and the Fourth Industrial Revolution are exciting, Prof. Tasaka sees deep workforce challenges: “Many of those to be thrown out of work are people engaged in jobs that depend on the application of professional knowledge and judgement based on logical thinking—two skills in which AI has an overwhelming advantage. Lawyers, accountants, doctors, pharmacists, and other professions are no exception.” The STEM-minded might infer that this extends to materials scientists and engineers as well. That would be a bitterly ironic scenario for a materials community moving us apace in the new direction.

While I am neither a scholar nor a deep thinker (readers know that), I have a more optimistic perspective that the trajectory of our technology is ever upward. There are always bumps, but our innovations invariably lead to improved and more widely shared standards of living and quality of life. There’s no artificiality about it.

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