



Both Reyes and Maruyama also agree that AI, and more specifically ML, are poised to have a significant impact on materials research. “I think the most immediate impact of the use of ML in materials is the ability to train models that can predict materials properties and performance from an appropriate set of features,” Reyes says, which will enable researchers to discover new and better materials options, and could be used to guide experiments and increase research efficiency. Maruyama adds, “using AI/ML approaches enables us to analyze and hopefully extract meaning from complex, interdependent, high-dimensional problems that are increasingly relevant as our experimental tools generate more and more complex data streams.”

AI-enabled materials research holds substantial promise beyond modeling and predicting, though. “One of the aspects of AI and ML that I am most looking forward to is the increasing use of natural language processing to sift through materials research and extract information and knowledge,” Reyes says.

And Maruyama highlights current work in Autonomous Research, which he

Links:

2019 update to the National Artificial Intelligence Research and Development Strategic Plan: nitr.gov/pubs/National-AI-RD-Strategy-2019.pdf

National Artificial Intelligence Research Institutes grant proposal solicitation: nsf.gov/pubs/2020/nsf20503/nsf20503.htm

says, “exploits AI algorithms via autonomous research robots that do rapid, closed-loop experimentation.” This means that the research robots can execute experiments, vary parameters, and characterize the results without human intervention. According to Maruyama, “Autonomous Research systems will lead to an exponential explosion in research progress, akin to a Moore’s Law for the speed of research.”

While dedicated, long-term AI research is clearly important, Reyes expresses concern that past calls to fund interdisciplinary AI/ML research have “required novelty in both the AI/ML aspect as well as the materials aspect,” which he says is too ambitious. “I believe the application of AI/ML to materials is research in and of itself,” he says.

Maruyama concurs: “We should think about how AI/ML improve the speed, depth, and productivity of research.” Maruyama characterizes this type of

research as a movement to advance how research is conducted, which is often overlooked as it does not comply with the usual nature of basic research.

Maruyama points out that “AI will help us make better and faster decisions about how to interpret and act on data,” and he expresses hope it will be funded by the AI research institutes because of the “fundamental changes it will bring to our research processes.”

One other critical area the AI research institutes will need to address, according to Reyes and Maruyama, is how they will prepare researchers to work in this field. The AI Research Institutes grant solicitation makes it clear that this is also one of the program goals, saying that the AI Research Institutes will “actively build the next generation of talent for a diverse, well-trained workforce.”

Jennifer A. Nekuda Malik

European Commission funds startups and SMEs to shape the future ec.europa.eu/research/eic

Seventy-five startups and SMEs have been selected in the largest funding round so far under the pilot phase of the European Innovation Council (EIC) Accelerator. Among the companies selected is Chrysalix Technologies in Estonia, a university spin-off producing sustainable fuel using organic material; Solenco Power NV in Belgium, to provide solar power nonstop on or off the grid; and Recresco Limited in the UK for the development of x-ray fluorescence,

shape recognition, and machine learning for efficient and economic recycling of mixed metals from co-mingled waste.

As a major novelty, 39 of these companies are set to receive both a grant and a direct equity investment. This is the first time that this “blended finance” has been offered, and it allows a much higher level of funding (up to €17.5 million per company) to accelerate the growth of European companies with groundbreaking innovations.

Mariya Gabriel, Commissioner for Innovation, Research, Culture, Education and Youth, said, “I am glad that this first offer of combined grant and equity financing saw such a high demand from Europe’s startups and SMEs. This confirms that the European Innovation Council is filling a gap in funding, and that it is right to set it up as a fully fledged initiative under the next EU budget.”

As well as the financial support, the startups and SMEs will have access to coaching, networking, and business acceleration services to help them build their businesses. □



ADVANCING MATERIALS. IMPROVING THE QUALITY OF LIFE.

Engaging members across generations to advance careers and promote materials research and innovation

MRS.ORG