



National Academies Workflow Discussion

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Vision

Transform DOE into a world-leading AI enterprise by accelerating the research, development, delivery, and adoption of AI.

Mission

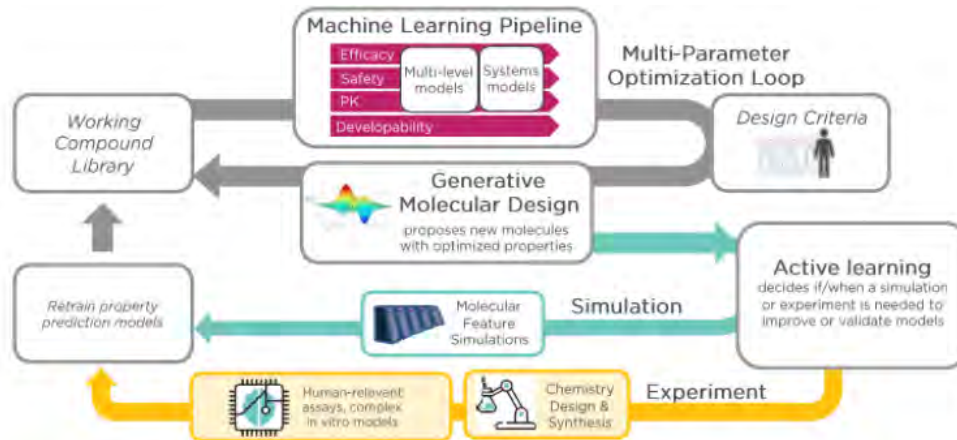
The Artificial Intelligence and Technology Office, the Department of Energy's center for Artificial Intelligence, will accelerate the delivery of AI-enabled capabilities, scale the department-wide development and impact of AI, and synchronize AI activities to advance the agency's core missions, expand partnerships, and support American AI leadership.

8 points for discussion today



1. Workflows should be a core part of AI efforts

- Each workflow is tailored to the problems they address, but in concept are the same.
- Successes improved by centering the business model on the workflow.
- AI should not be an afterthought or an add-on to prior constructs
- Workflow has distinct elements, handoffs, and shared fate.





2. Today AI is a broad technology out in all sectors of the economy. It should be considered in a broader context than just science, education or technology.
 - Progress against harder problems require opening relevant data – that is data tied to outcomes that people care about
 - The data side is not simple. Access models that enable full access to learning models is not always simple.
 - A diversity of skills are needed to span the elements of an effective workflow
3. In the past, federal agencies have created major impact amplification of research enhancing technologies. A notable one is the Human Genome Initiative then the Project which was envisioned at the start as technology convergence based on progress in lasers, dye-tagging, robotics, computing,... all outside of medicine.



4. Public private partnerships will be important. AI value is outcome based and solving relevant problems – which means data for things that matter – is an important part.
5. Standards will help. Models shared where they have been successful would add value. Not concealing these as proprietary and part of the secret sauce that companies develop will be the challenge.
6. Risks: there are many. For example:
 - Success can lead to failure – mining from data causes people to revisit sharing the data
 - AI workflows – while part of the future – may not be consistent with our reductionist of distilling the essence of nature in the simplest forms.

Social challenges and future aspirations



7. Privacy, ethics, and similar socially based topics will be emergent and will have to be part of the workflow cycle. They will likely dynamically emerge as (a) you add more data into the cycle (b) you modify the questions you are asking or in other surprising ways. Building in natural in-line ways to be sensitive to data uses is new territory to explore and develop.
8. In the years to come, ideally, workflows will just be how we do day to day business. Data will drop into curated and labeled environments and naturally fall into the update cycles of learning, driving models, simulation and experiments in equal ways. AI will become the fourth pillar, augmenting experiment, theory and simulation so that all are part of the fluid tools we apply for solving problems important to us.