



Executive Summary

Reflecting the Past, Shaping the Future: Making AI Work for International Development



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Authors: Craig Jolley, Shachee Doshi, and Aubra Anthony of the Strategy & Research team within USAID’s Center for Digital Development.

Cover photo: USAID’s Responsible Engaged and Loving (REAL) Fathers Initiative aims to build positive partnerships and parenting practices among young fathers.

Credit: Save the Children

For details on the other artwork in this Executive Summary, see “About the Artwork” section on pg. 90-91 of the [full report](#).



THE PURPOSE OF THIS DOCUMENT

AI technologies are gaining prominence across the developing world and, if implemented carefully, can expedite a country's journey to self-reliance. USAID's 2018 report *Reflecting the Past, Shaping the Future: Making AI Work for International Development* outlines the promise of Machine Learning (ML) and Artificial Intelligence (AI) and gives reasons for caution as we engage with and integrate AI-based systems into development programming. This document summarizes the main findings of the report: setting the context, providing examples of ML and AI applications in development, laying out best practices for working with these technologies, and reinforcing the critical role of development practitioners in ensuring responsible deployment of these tools.

WHAT ARE ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING?

Machine learning (ML) is a technique in which computers “learn” to recognize patterns in data, creating systems that can be more flexible, responsive, and adaptable than previously possible. Machine Learning is one component of Artificial Intelligence, just as learning is one component of human intelligence. Artificial Intelligence (AI) enables computers to automatically make decisions, often based on machine learning approaches. All ML/AI systems are built on data, which can come in many forms, including numerical, text, images and audio.

ML and AI applications may sometimes seem like science fiction, but these tools have become part of daily life for billions of people. Widespread digital services such as interactive maps, tailored advertisements and voice-activated personal assistants are likely only the beginning. Some AI advocates even claim that the impact of AI will be as profound as electricity or fire — that it will revolutionize nearly every field of human activity.



PHOTO: NICHOLE GRABER FOR USAID

AI IS PLAYING A RAPIDLY GROWING ROLE IN DEVELOPMENT

Global enthusiasm around AI has reached international development as well. ML and AI show tremendous potential for helping to achieve sustainable development objectives globally. They can improve efficiency by automating labor-intensive tasks or offer new insights by finding patterns in large, complex datasets. A recent [report by Accenture](#) suggests that by 2035, AI advances could double economic growth rates and increase labor productivity by 40 percent.

At present, AI technologies — many of which are USAID-supported — are being applied to nearly every sector in development. These include prediction systems to optimize smallholder farming ([PEAT](#), [Apollo](#), [CIAT](#)), diagnostic tools



Machine Learning Examples in Development

FINANCIAL ACCESS: Smartphone apps by companies like [FarmDrive](#) and [Tala](#) use ML to determine people's creditworthiness based on nontraditional data available through their patterns of mobile phone usage. [Tulaa](#) uses ML to provide farmers tailored economic and agricultural advice and connect them to input credit. Platforms like these can help large sections of the world's financially underserved population gain access to loans.

CRISIS RESPONSE: [AIDR](#) is an ML-based open source platform that classifies social media messages during humanitarian crises. It can be mined and analyzed by first responders to strategically target responses. [Grillo](#) uses ML to rapidly generate early warnings of earthquakes based on data from inexpensive ground motion sensors.

to empower health workers by forecasting disease outbreaks ([Mt. Sinai, Dalberg](#)), and image analysis to gauge damage from natural disasters ([OpenAI Challenge](#) by the World Bank, WeRobotics, and OpenAerialMap).

ML/AI technologies can also enable new knowledge management tools — such as improved search, document summarization, and conversational interfaces — that will help donors like USAID learn from experience and build on previous successes ([SAP & UN OCHA](#)).

ML/AI tools can also enhance our ability to work safely in non-permissive environments. For example, situational awareness tools can aggregate information from satellite images ([DataKind & World Bank](#)), news reports or social media ([Dataminr](#)) to provide rapid updates on unfolding security crises. Remote data-gathering tools such as drones can help to keep personnel safe while still providing essential information from hard-to-reach places ([Project Premonition by Microsoft](#)). As we continually strive to make our development and humanitarian programming as effective as possible, AI offers unique promise.

APPROACHING AI WITH A CAUTIOUS AND CRITICAL LENS WILL HELP REALIZE ITS POTENTIAL IN DEVELOPMENT

Along with their incredible promise, AI systems bring risks of harm or misuse. In particular, machines always learn using data from the past, so when existing patterns of oppression, exclusion or bias are embedded in data used to train ML models, these inequities will be reflected in what the models learn. In addition, seemingly straightforward design choices — for example, how to evaluate a model's accuracy — can reflect the biases of a model's designer. Moreover, AI systems are often opaque, meaning that their ultimate decision processes are difficult for people to explain or understand, which can further undermine accountability and erode trust.

AI deployments in developing countries face several unique challenges. First, there are limitations around data availability. High-volume and high-quality digital data can be hard to come by in developing countries, meaning that model developers may need to make do with data that are outdated, biased or drawn from a different context. When the data being used to train a model represents only a limited slice of reality, the resulting model will be similarly limited. Additionally, if AI tools



How “data problems” can lead to real-world problems

TRAINING DATA ARE TAKEN OUT OF

CONTEXT: ML models can only make predictions based on what they've seen. For example, if a model for satellite image analysis is trained on data from Las Vegas, it may fail in Khartoum or Phnom Penh.


TRAINING DATA ARE OUT OF DATE: ML models are built on data from the past. If a model isn't regularly updated and retrained, its predictions may become irrelevant or inaccurate.


TRAINING DATA MEASURE THE WRONG


THING: Sometimes we cannot measure the things we would like to. When data are not available, easily measurable proxies are used as a stand-in. For example, we may use the number of hospitalizations as a proxy for disease incidence, or the number of arrests as a proxy for crime. If not done carefully, this can result in models that reflect underlying inequities (e.g., in hospital access or police presence). In this case, models may create the illusion of being neutrally data-driven; in reality, they lead to decision systems that reinforce patterns of exclusion or oppression.





How Good Models Can Go Wrong

 **HARD-CODING INEQUITIES:** If social, cultural or geographic biases are encoded in training data, the resulting model will include the same biases. For example, a resume-scanning algorithm may be skewed to favor male applicants if the algorithm was trained on gender-biased historical data. While the model may prove accurate in predicting future high-performers, it will also perpetuate existing exclusive practices.

 **OPAQUE MODELS:** Highly accurate ML models can sometimes be very difficult or even impossible to interpret. Such models may be problematic in contexts requiring transparency or oversight, such as credit scoring, school admissions or criminal justice.

 **MISPLACED TRUST:** Sometimes people overestimate how well a model works. In other cases, users trust a model only when it agrees with their own biases, and human oversight can make things worse. Decision-makers and other “customers” need to understand what they are getting, and ultimately how reliable a model is expected to be.

 **WRONG TOOL FOR THE JOB:** Even if a model is highly accurate, it may not be well-aligned to the decision-making process it is intended to support. For example, models might be too slow, provide the wrong amount of detail, or predict things that are just not important for real-world decisions. Given widespread excitement around the technology, it is an unfortunate reality that sometimes ML models may be deployed even when they are not suitable tools for the task at hand.

 **ACTIVE MISUSE:** Because of its ability to rapidly integrate disparate data sources and make inferences about individuals, AI can be weaponized as a tool of surveillance and social control. Security cameras are increasingly equipped with facial-recognition software, and individuals’ social media use can be mined for indicators of dissent and protest. New technologies allow propagandists to generate authentic-looking audio or video that can be used to mislead the public. The weakness of privacy and data protection laws in many developing countries makes these technology developments even more troubling.

are deployed in remote or rural areas, we must ensure that their requirements for connectivity and bandwidth are realistic. Although internet access continues to grow worldwide, the digital divide is persistent and significant in many developing countries.

The nature of AI tools makes the need for local grounding even more pressing than with other technologies. AI makes predictions or takes actions based on patterns learned from data. The resulting models can be surprisingly brittle when faced with new situations that diverge from the context in which the models have been trained and tested. As a result, local input into AI construction and deployment is crucial; AI tools should always be locally-tailored so that relevant context and sensitivities inform how software developers approach tool design and evaluation. Many countries do not yet have an IT workforce with sophisticated AI skills, which can lead to tools being “air-dropped in” from a vastly different context. This export-import approach

is likely to lead to inaccuracies at best and unfair or discriminatory failures at worst. This underscores the need for deep local partnerships and a sustained investment in nurturing indigenous AI talent.

Lastly, with a rapidly-evolving field like AI, it is virtually impossible for regulatory protections to keep up with emergent risks. “Black-box” models can create additional unique challenges for oversight and accountability. Use of AI can lead to obscured decision-making processes, limiting our ability to know what was done, why, and who can be held responsible. Where citizens may struggle to hold those in power accountable for corruption or abuse, AI can compound rather than ease information and power asymmetries.

THE DEVELOPMENT COMMUNITY MUST HELP TO SHAPE AN AI-ENABLED FUTURE

In 2018, USAID released a [report](#) entitled **Reflecting the Past, Shaping the Future: Making AI work for International Development**. It examines various use cases and presents case studies of ML/AI applications in development. It also provides a guide to best practices for development actors to engage with technologists and implementing partners to ensure that issues of context, fairness and bias are addressed in any ML application.

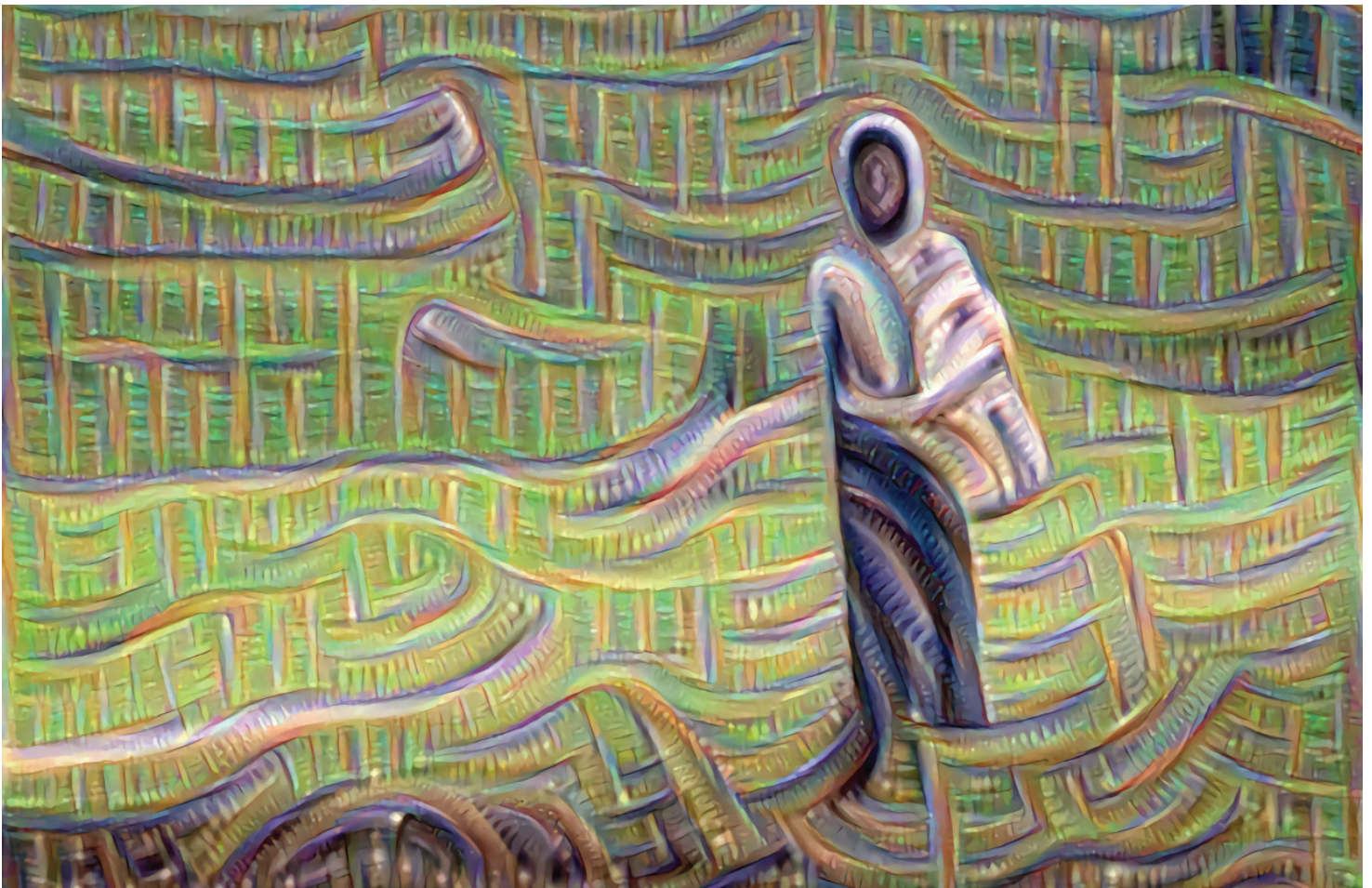
Getting ML and AI applications right will require an active, holistic and concerted effort.

There are several things the development community can do to maximize the benefits of AI while mitigating its risks. First, we can **adopt a responsible-use mindset** when it comes to AI. This means explicitly considering the risks and unintended impacts of algorithms in project design, implementation and evaluation. When we co-create systems that will be used by host country governments, we need to be sensitive to the ways in which technology design can encode policy choices and ensure that we are promoting democracy rather than circumventing it.

Second, we can **foster deep local partnerships**. To do this, we must involve technology users, owners and regulators in the design process, consulting them early and often. We also need to **promote algorithmic literacy** in the countries where we work, and work to cultivate an indigenous AI workforce that can build and deploy responsible solutions to local problems.

It is clear that AI will be a key piece of an ongoing global digital transformation, shaping how people in developing countries do business, get information and interact with their governments. For development efforts to succeed in this digital age, we must commit to understanding how these powerful new tools work and recognizing when they are most likely to succeed or fail.

Depending on how it is used, AI has the potential to build prosperity and support a country's journey to self-reliance, or to entrench exclusion and dependency. Regardless of whether the development community embraces or ignores AI technologies, these technologies will find their way into emerging markets. By proactively engaging with AI, we have the opportunity to promote its responsible use and ensure that it reinforces, rather than undermines, our shared development goals.





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