

Co-Intelligence

Living and Working with AI

Review by Lisa Murray-Roselli | Book by Ethan Mollick

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Does the ever-growing presence of AI make you uncomfortable, curious, both? For educators, business professionals, and anyone who uses the internet, Ethan Mollick's *Co-Intelligence* will help readers to understand how humans and machines can, and should, work together.

Ethan Mollick is a professor at the Wharton School of the University of Pennsylvania where he studies and teaches entrepreneurship and innovation, and AI. With *Co-Intelligence*, he aims to give readers a digestible history of the development of AI, provide examples of its use, and give some guidance regarding its future. Mollick's experience and curiosity allow readers to enter the world of AI with a guide who illuminates both the potential and the dangers of this world with a clear and balanced perspective. His primary message is that humans need to maintain command of the technology.

In addition to his work as a professor, Mollick is also the academic director and co-founder of Wharton Interactive, which provides research and resources for teaching and learning with AI as well as a games and simulations component. These games, simulations, and the latest pedagogical research enable new kinds of learning experiences that are designed to transform and democratize education. In *Co-Intelligence*, Mollick draws on his years of practical expertise to give readers a useful and thought-provoking exploration of the many aspects of AI.

Readers will learn to

- make sense of how AI functions
- align AI to human values and goals
- employ the rules for co-intelligence
- use AI as a co-worker, tutor, and coach

INITIAL INSIGHTS

Ethan Mollick wants readers to be aware that AI doesn't actually know anything. Essentially, it is a predictive entity that fills in the blanks with the data we provide for it...for now. As it becomes more sophisticated and has access to more information, its human-like quality also expands, which has both positive and negative implications. The author stresses that, because of the potentially exponential and unknown power of AI in the future, humans must always remain in control and ensure that it is aligned with human values and goals. We should aspire to maintain a co-intelligence—using AI as a co-worker, tutor, and coach. *Co-intelligence* cautions that, as it becomes more human than alien, we have to make sure AI represents the best, rather than the worst of humanity.

MECHANISMS OF AI

AI is not like traditional software, which provides constant and reliable output. Because AI is constantly consuming data, its response to a prompt will always vary slightly. Building on ideas like Alan Turing's Turing Machine (a mathematical model of computation describing an abstract machine that is capable of implementing any computer algorithm) and early machine learning instruments of the 1950's, the latest AI boom began in the 2010s with a technique called, "supervised learning." This type of learning requires "labeled data," which is data that is embedded with the correct answers or output for a particular task and was mainly used by large organizations to optimize shipping logistics or to push content based on a browsing history. Its use was often referred to as "big data" or "algorithmic decision-making."

In 2017, a paper was published by industry experts that introduced a concept called the "Transformer." The Transformer facilitated the computer's ability to understand human language, specifically by utilizing an "attention mechanism" that focuses the AI on the most relevant aspects of a given text. The result was an AI that could produce more complex and coherent predictive text. Transformer-powered AI eventually advanced into what we now refer to as Large Language Models (LLMs) and Chat Generated Pre-trained Transformer (ChatGPT), whose predictive capabilities are increasingly refined and flexible.

LLMs are trained on vast amounts of unsupervised text from a variety of sources: websites, books, and other digitally-available documents. This is

not the labeled data of previous iterations—there is no pre-programmed output. LLMs learn to recognize patterns, structures, and context in human language and can create models that mimic the ways humans communicate through text. Depending on the prompt, AI can generate almost any style of writing with any type of content. And, Mollick advises, therein lies the danger. While AI can provide remarkably efficient and accurate assistance in many fields of business and education, it is pulling data from a wide range of sources, some of which may be simply false, but some may be wildly unethical or manipulative. It is up to the user and those building AI systems to filter out untruths and threats.

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AI AS CO-WORKER, TUTOR, AND COACH

Aligning AI to the best intentions of humanity takes constant vigilance. Complicating the matter is that humans don't always agree on those intentions or on the type of society we should cultivate. That friction is not likely to go away, but Mollick insists that AI must remain in the co-pilot seat in order for humans to remain in control of their destiny and to use AI to our best advantage in life and work.


PROTOCOL FOR CO-INTELLIGENCE

Co-intelligence starts with understanding that the data consumed by AI is neither objective nor reliable. In addition, as a predictive entity, AI cannot discern fact from fiction and will simply fill in the most likely text based on its input and the prompt. The output may be complete fiction or, as it has come to be known, a "hallucination." Biases related to gender and race also infiltrate the data. For example, a Bloomberg study repeatedly asked the AI to produce an image of a judge. 97 percent of the results were male even though 34 percent of US judges are female.

To counter bias, hallucinations, and manipulative content, Reinforcement Learning from Human Feedback (RLHF) employs human beings from all over the world to assess AI output. Although that process is fraught with problems (low pay, mental health concerns), Mollick believes that we should continue to find conscientious ways for human beings to weed out the worst of AI. If the technology is to work as a co-intelligence, it must always be aligned with the best of what humanity has to offer.

The author describes four rules that comprise key features of co-intelligence: 1) always invite AI to the table, 2) be the human in the loop, 3) treat AI like a person (but tell it what kind of person it is), and 4) assume this is the worst AI you will ever use. Protecting ourselves from the dangers of an unsupervised AI means we must gain an expert understanding of its potential. This requires attempting to use it in all that we do and staying in the loop of its operations. As AI output increasingly reads and sounds like human responses, the temptation will be to treat it like a human, creating unrealistic expectations or giving it too much trust. Mollick encourages readers to avoid that trap by providing prompts that will guide the AI according to your expectations. You can have fun and experiment with eliciting different personas but remember that you are the only real human

in the room. Finally, the growth of AI has been so rapid that, Mollick admits, even *Co-Intelligence* may be out-of-step by the time it is being read. The takeaway: we've got to stay on top of this technology as it blazes ahead.



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PARTNERING WITH AI

At its best, AI can be a brilliant co-worker, tutor, and coach. Workers in the 21st century have the same concerns about AI as workers in the Industrial Revolution had about machines and those in the 20th century had about computers: replacement. Those concerns were legitimate – workers *were* replaced by technology – but other jobs emerged at the same time. For the most part, there needed to be a human supervising, operating, and developing that new technology and machinery. AI presents a similar scenario. Mollick reassures readers that, although your job will likely absorb some sort of AI, that does not mean that you will become redundant. AI is likely to become a partner in most everything we do, but our human expertise and knowledge of facts must be prioritized and sustained.

In the best-case scenario, co-workier AI will take over the dull, everyday tasks that humans would love to avoid anyway, leaving work that requires creativity, complex human reasoning, and personal interactions to us. The author believes we can divide our tasks into categories: those that you don't want to spend a lot of time on, and that AI is capable of handling (although you will provide a final review), and those that we want to do for personal, ethical, or creative reasons. AI Tasks vs Me Tasks will morph and shift as the technology advances and as humans become more accustomed to and adept at integrating AI into their lives.

Education and learning in general is already feeling the benefits and ethical challenges of using AI as a tutor. Although students are able to learn more independently with AI assistance, Mollick believes that classroom learning will become more essential as an active learning space. Passive learning (teacher lectures and students take notes), which dominates many educational structures, will give way to students practicing skills, solving problems, and explaining ideas in their own words through writing and discussion. AI will be used at home for rote tasks and the individualized learning of skills and facts. This is referred to as a “flipped classroom” and, if executed correctly, AI will not take the place of students’ needing to know facts but help them to learn and employ them meaningfully.

Expertise is the key concept to keep in mind when predicting the effect of AI as a coach. Mollick explains that the fundamentals of building expertise are a robust basis of knowledge/working memory and deliberate practice. Working memory is the part of the brain in which problem solving and learning happens. Deliberate practice involves a continuous increase in the degree of difficulty/complexity of the task with guidance and feedback from a mentor or teacher. The apprentice phase of developing expertise cannot be skipped, yet when AI takes over for the experts, that relationship between student and mentor, and the ability to practice and perfect skills, can be lost. Keeping AI in the role of coach rather than expert will help to maintain that essential phase of learning.

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PUTTING IT ALL TOGETHER

Here are some ways to develop AI as a co-intelligence:

Familiarize yourself with the processes of AI and LLMs.

Pay special attention to the means by which they amass data and the potential hazards inherent in that source material. Relying on AI as a neutral or objective source of information is always a mistake—AI is fed data sourced from human creators who have experiences, perspectives, and biases that can alter the factual nature of AI output. Always check the work of any AI using trusted sources.

Discover where your life and work intersect with AI.

AI can take over tedious tasks without interfering with human creativity and connection. List your daily activities and select those that are repetitive, dull, or would benefit from improved efficiency. Monitor the advancements of AI to assess what tasks could be assigned to the machines and those that are better served by doing them yourself or that you simply enjoy.

Practice using AI.

Understanding the capabilities, limitations, and potential future of AI requires constant engagement with the technology. There is a certain amount of fear and misunderstanding when the topic of AI is introduced—practical knowledge of its use through consistent practice is the only way to overcome this. Work with colleagues and trusted resources to learn how to use AI to your advantage.

Advocate for using AI as a co-intelligence with human expertise.

AI has enormous potential to assist in advances that will make our civilization better, but humans must always be in charge of the machines. Avoid placing too much trust in AI's capabilities as the technology becomes more sophisticated and human-like and foster your own expertise. Participate in keeping AI as a co-intelligent partner by aligning your AI activity to human values and goals.

PARTING THOUGHTS

Co-Intelligence provides readers with a balanced view of AI. Mollick's experience using AI allows us to learn about exciting and practical uses of the technology that will advance our civilization and boost the skills of the least able to be more on par with the most competent. Education is the field in which Mollick's expertise shines a light on those practical uses. Every student with a phone, tablet, or computer has access to AI. Educators are already striving to both ensure they can discern human-completed homework from AI-completed homework and to find the best uses of AI to assist with their teaching. This is a microcosm of our relationship with AI: finding ways to preserve and enrich our essential human complexities and gifts while using this rapidly-advancing technology to our benefit rather than our downfall.

Today's decisions about how AI reflects human values and enhances human potential will reverberate for generations.

ABOUT THE AUTHOR

ETHAN MOLLICK is the Ralph J. Roberts Distinguished Faculty Scholar and Associate Professor at the Wharton School of the University of Pennsylvania, where he studies the effects of artificial intelligence on work, entrepreneurship, and education. His academic research has been published in leading journals, and his work on AI is widely applied, leading him to be named one of TIME Magazine's Most Influential People in Artificial Intelligence.

In addition to his research and teaching, Ethan is the Co-Director of the Generative AI Labs at Wharton, which build prototypes and conducts research to discover how AI can help humans thrive while mitigating risks. Prior to his time in academia, Ethan co-founded a startup company, and he advises numerous organizations. Mollick received his PhD and MBA from MIT's Sloan School of Management and his bachelor's degree from Harvard University.

ALSO BY AUTHOR

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