



# Stories as Technology: Past, Present, and Future

Roger's Bacon<sup>1</sup>, Sergey Samsonau<sup>2</sup>, Dario Krpan<sup>3</sup> (example article)

***“What is it about a good story that causes it to have life-changing effects on one person and not another? I wonder if future technologies will enable us to develop the type of truly deep and fine-grained understanding of stories as social, cognitive, and emotional technologies that might allow us to answer this question with a high-level of precision.”***

Humans are storytelling animals. According to historian Yuval Noah Harari, stories are the [key to our success](#) because they provide us with our unique ability to flexibly cooperate in large groups. He describes this view in the following excerpt from his best-selling book *Sapiens*.

“Fiction has enabled us not merely to imagine things, but to do so collectively. We can weave common myths such as the biblical creation story, the Dreamtime myths of Aboriginal Australians, and the nationalist myths of modern states. Such myths give Sapiens the unprecedented ability to cooperate flexibly in large numbers. Ants and bees can also work together in huge numbers, but they do so in a very rigid manner and only with close relatives. Wolves and chimpanzees cooperate far more flexibly than ants, but they can do so only with small numbers of other individuals that they know intimately. Sapiens can cooperate in extremely flexible ways with countless numbers of strangers.

Any large-scale human cooperation—whether a modern state, a medieval church, an ancient city, or an archaic tribe—is rooted in common myths that exist only in people's collective imagination. Churches are rooted in common religious myths. Two Catholics who have never met can nevertheless go together on crusade or pool funds to build a hospital because they both believe that God was incarnated in human flesh and allowed Himself to be crucified to redeem our sins. States are rooted in common national myths. Two Serbs who have never met might risk their lives to save one-another because both believe in the existence of the Serbian

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nation, the Serbian homeland, and the Serbian flag. Yet none of these things exists outside the stories that people invent and tell one another. There are no gods, no nations, no money and no human rights, except in our collective imagination.”

This is a view of stories, broadly construed, as a social, emotional, and motivational technology that enables the achievement of collective goals. English professor Angus Fletcher (and former neuroscience researcher) develops a similar view in a recent book *Wonderworks: The 25 Most Powerful Inventions in the History of Literature* and argues that we should be teaching literature more like a STEM subject. He discusses his views in an [interview with Nautilus magazine](#):

*Why do you call literature a technology?*

“A technology is any human-made thing that solves a problem. Most of our technology exists to master our world, to domesticate space. That’s why we have smartphones and smart homes and satellites. Literature tackles the opposite set of problems: not how to master the nonhuman world but how to master ourselves. It wrestles with the psychological problems inside us. Grief, lack of meaning, loneliness - literature was invented to deal with these problems. To have happy and democratic societies, effective engineers and scientists, we need people who are joyful, not angry, who have a deep sense of empathy and purpose, who have an ability for logic and problem-solving. You get all these things from literature.

...It’s a machine designed to work in concert with another machine, our brain. The purpose of the two machines is to accelerate each other. Literature is a way of accelerating human imagination. And human imaginations accelerate literature.”

Neuroscientist and author Erik Hoel also proposes a similar perspective - fiction as a kind of imagination technology - in a [fascinating paper](#) that outlines a new functional theory of dreaming - The overfitted-brain hypothesis (OBH).

“Notably, all deep neural networks face the issue of overfitting as they learn, which is when performance on one data set increases but the network’s performance fails to generalize (often measured by the divergence of performance on training vs. testing data sets). This ubiquitous problem in DNNs is often solved by modelers via “noise injections” in the form of noisy or corrupted inputs. The goal of this paper is to argue that the brain faces a similar challenge of overfitting, and that nightly dreams evolved to combat the brain’s overfitting during its daily learning. That is, dreams are a biological mechanism for increasing generalizability via the creation of corrupted



sensory inputs from stochastic activity across the hierarchy of neural structures. Sleep loss, specifically dream loss, leads to an overfitted brain that can still memorize and learn but fails to generalize appropriately.”

The OBH is distinguished from other dream function hypotheses in that it takes the phenomenology of dreams - sparse, hallucinatory, fabulist, narrative - as the key functional feature, not the epiphenomenal expression of some background process like memory consolidation.

“Rather, the point of dreams is the dreams themselves, since they provide departures away from the statistically-biased input of an animal’s daily life, which can assist therefore increase performance. It may seem paradoxical, but a dream of flying may actually help you keep your balance running”

Dr. Hoel closes the paper by speculating that fictions may serve as artificial dreams and accomplish some of the same overfitting-prevention function.

“Finally, it is worth taking the idea of dream substitutions seriously enough to consider whether fictions, like novels or films, act as artificial dreams, accomplishing at least some of the same function. Within evolutionary psychology, the attempt to ground aspects of human behavior in evolutionary theory, there has been long-standing confusion with regard to human interest in fictions, since on their surface fictions have no utility. They are, after all, explicitly false information. Therefore it has been thought that fictions are either demonstrations of cognitive fitness in order to influence mate choice (Hogh-Olesen, 2018), or can simply be reduced to the equivalent of "cheesecake" — gratifying to consume but without benefit. Proponents of this view have even gone so far as to describe the arts as a "pleasure technology" (Pinker, 1997). However, the OBH suggests fictions, and perhaps the arts in general, may actually have an underlying cognitive utility in the form of improving generalization and preventing overfitting, since they act as artificial dreams.”

All of these ideas and perspectives point to a simple fact that we all intuitively recognize - stories (and fictions more broadly) can have significant effects on the mind (and human culture at large). Unsurprisingly, there has been a great deal of research on the short-term and long-term effects of fiction (in literature, film, etc.) on human psychology (cognition, personality, emotions, etc.) and much more remains to be done (see the works cited below for a small sample of research in this area). Beyond any insights gained from our current state of research, common intuition and anecdotal evidence tell us that stories have a unique power to effect psychological transformation. What is it



about a good story that causes it to have life-changing effects on one person and not another? I wonder if future technologies will enable us to develop the type of truly deep and fine-grained understanding of stories as social, cognitive, and emotional technologies that might allow us to answer this question with a high-level of precision. This understanding, coupled with AI and other advanced technologies of various kinds (see below), could lead to the development of advanced “story engineering” capabilities (i.e. the ability to create stories that can elicit highly specific psychological effects on an individual), a technology which may prove both immensely useful and potentially dangerous. The remainder of this paper represents a few (scattered) speculations on what this future might look like.

II.

We are approaching a future in which AI writes fiction really well, *like really really well* (see [GPT-3 creative fiction](#) for some current AI writing). Future AI will not just be limited to literary masterpieces, the generation of AI-generated visual media (next gen “Deep Fakes”) will enable the creation of instant classic movies as well. There is no reason to think that in the long run artificial intelligence won’t eventually surpass humans in every artistic domain (though of course many people disagree with this statement - see “[Why Computers Will Never Write Good Novels](#)” by the aforementioned Dr. Fletcher).

AI-generated stories, advanced neuroscientific imaging and manipulation techniques, and massive amounts of psychosocial data could create something like high-throughput neuro-fiction analysis. This could lead to sophisticated insights (either by artificial intelligence or human intelligence) into how plot elements, characters, contextual factors (the when, where, why, and how of a story), and the psychological profile of the reader/viewer lead to the mental effects of stories.

I can envision a future in which AI-generated stories are of superhuman quality, so incredibly compelling that they act as a kind of superstimulus causing exaggerated (and potentially maladaptive) behavioral responses. We will all be like the male *Julodimorpha* beetle, irresistibly drawn to a brown beer bottle because of its extreme size, color, and dimpled bottom - the definition of sex appeal in a female *Julodimorpha* beetle ([pictures](#)).

The custom design of stories based on a specific individual’s psychology, and beliefs will prove especially powerful. We are already at the nascent stages of this technology, with the [Cambridge Analytica scandal](#) during the 2016 US election serving as a proof of concept. Cambridge Analytica claimed to develop detailed psychological profiles of individuals based on a variety of data sources (some of them illegal) and then use those profiles to micro-target voters with advertisements designed to be effective for different personality types. Many are dubious of the effectiveness of these techniques given our current technology and knowledge, but there is no reason to think that they couldn’t be highly effective in the future. We already recommend books that we think someone will



like based on our knowledge of their minds, why wouldn't a super-intelligent AI with massive amounts of data be able to do the same with a superhuman level of skill? Think amazon, but instead of just providing recommendations, the algorithm also generates the stories for you and you only.

III.

As with most powerful technologies, we can imagine benevolent and malevolent applications for advanced story engineering (as we may call it).

Will there be a way to use AI-generated fictions as therapy for mental illness or for targeted support in difficult times? Will doctors prescribe a story, the perfect one made just for you, to help you deal with the grief from a lost loved one? Will AI-generated fictions be used as creativity and imagination technologies? If there is a piece of fiction that can give you the inspiration needed to overcome writer's block or answer a puzzling scientific question, then we will be able to generate it and give it to you at the perfect time in the perfect format.

Advanced story-engineering could be immensely useful in education. Instead of teachers choosing novels based on their preferences and whims and just hoping that it resonates with the class, an AI author will be able to conduct a comprehensive psychological analysis of the students (including mental characteristics, but also their current level of knowledge and skills) and write the perfect story - highly original, deeply moving, and educational - for the class to read and discuss together. Factually accurate and intensely compelling stories can be generated on demand to teach concepts in science, history, and other subjects. We can imagine an AI tutor that monitors the social-emotional learning skills of a student and creates custom stories that teach interpersonal skills, empathy, resilience, etc.

There are many dangers here as well, some of which are not unique to AI-empowered story engineering, such as the problems arising from the ceding of control of a system to a black box AI. Some movies are known as "cult classics" because of their small, obsessive fanbases; in the future, there may be AI-generated fictions that truly do inspire an intense cult-like level of devotion, and in large numbers of people. This will be especially dangerous when the lines between reality and fiction become blurred. Consider [QAnon](#), often described as cult by its (many) critics - a series of anonymous posts on an internet message board started a worldwide movement that has had significant political and cultural consequences, including an important role in the U.S. capitol riots. Advanced AI may be able to generate conspiracy "stories" like QAnon capable of inciting even greater levels of fervor and extremist behavior. Again, we are already at the beginning stages - a team from Middlebury college has used GPT-3 to create a [QAnon chat bot](#). Synthetic visual and audio media may be able to generate entire personas that exist only in video and audio - imagine an AI [Alex Jones](#).



It may be difficult or impossible to tell if the person is real or not; perhaps people won't even care.

Countermeasures will have to be developed. I can imagine a kind of “fiction hygiene” for individuals and society in the same way that we have personal and public hygiene. Paradoxically, the best way to prevent people from becoming too obsessed with stories might be to use stories that warn against the danger of doing so.

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- Note: the validity of these results has been the source of significant controversy - see the following papers by Kidd & Castano and Panero et al.

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