

Using Artificial Intelligence Tools to Expand Your Genealogical Research Universe

By James L. Tanner

One purpose of this Syllabus is to place the current high level of awareness of AI into its historical context. The Syllabus is not intended to be a complete history of the development of computers, but some history clarifies the current dramatic developments.

Much of current genealogical research is stuck in the Paper Age. I ask the question: are you ready to move on to a new computer-based, AI driven methodology?

The embodiment of a mechanical or Artificial Intelligence or AI dates into antiquity and has evolved over time with the development of computer science. The present advances in AI have been enabled due to advances in computer speed and storage capabilities. For example, the largest supercomputer in the world as of November 2023 is the Frontier. It's an AMD-based system built by Hewlett Packard Enterprise (HPE) and housed at the Oak Ridge National Laboratory (ORNL) in Tennessee, USA. Frontier is the first exascale supercomputer, capable of performing more than a billion, billion operations per second, known as an Exaflop. This supercomputer is used to process vast amounts of data quickly, transforming our understanding of various fields such as climate change and medicine.¹ Microsoft and Google are using supercomputers to develop their AI capabilities.

Going way back in history, one of the earliest sources of the idea is the ancient Greek myth of Talos, a bronze automaton who guarded the island of Crete from invaders. He was either created by Hephaestus, the god of metalworking, or was the last survivor of the brazen race of men. He had a single vein that ran from his neck to his ankle, sealed by a bronze nail or a thin membrane. He was killed by Medea, the sorceress, who either tricked him into removing the nail or made him bleed by grazing his ankle on a sharp rock.²

As a linguist³, I have frequently researched and reflected on the concepts of self-awareness and the universality of language as it was first expressed by René Descartes in his famous statement, "I think, therefore, I am" or "*Cogito, ergo sum.*" This concept is a fundamental element in Western philosophy, and it suggests that the act of thinking by itself establishes the existence of the one who thinks. Descartes had a dualistic view of the mind and body and believed that the mind (or soul) and the body are distinct substances. He argued that the mind is a thinking, non-extended thing that can exist without the body, which is an extended, non-thinking thing. He also

¹ World Economic Forum. "These Are the World's Top 10 Fastest Supercomputers," June 21, 2022. <https://www.weforum.org/agenda/2022/06/fastest-supercomputers-frontier-exascale/>.

² GHD. "Meet Talos, the Killer Robot from Ancient Greek Mythology," January 17, 2021. <https://www.greecehighdefinition.com/blog/meet-talos-the-killer-robot-from-ancient-greek-mythology>.

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claimed that the mind and body interact causally through the pineal gland⁴ in the brain. This view is also known as substance dualism or Cartesian dualism.⁵ This mind-body dualism has been influential in Western philosophy and has had implications for discussions on the mind-body problem.⁶ If you were to adopt this philosophical position, as do many religionists, there would be no possibility of an “intelligent” machine.

One early reference to intelligent machines is found in a book written in 1872 entitled “Erewhon” by Samuel Butler.⁷ Part of the book has a chapter called “The Book of the Machines” that incorporates the idea that machines can exhibit intelligence, or even consciousness, like living organisms. The book was written as an echo of the Luddite movement.⁸ The Luddite movement was a protest by British textile workers in the early 19th century against the use of machines that threatened their jobs and livelihoods. They named themselves after Ned Ludd, a mythical figure who supposedly destroyed a textile machine in 1779. The Luddites broke into factories and smashed machines, sometimes clashing with the authorities. The government responded by passing laws that made machine breaking a capital offense, and many Luddites were executed or deported. The movement faded away by 1813, but the term Luddite is still used today to describe people who oppose new technologies.

The idea of AI became a common theme for science fiction stories and novels. Authors who featured AI range from Robert Heinlein to Ray Bradbury and William Gibson. Probably the most famous of these novels is a collection of short stories by Isaac Asimov entitled “I Robot,” published in 1950, “the author's second work, a collection of nine interwoven stories dealing with a futuristic world where humans and robots interact on a daily basis.”⁹ Science has now almost caught up with science fiction.

⁴ The pineal gland is a tiny endocrine gland in the middle of the brain. It helps in regulating the sleep cycle. It also maintains circadian rhythm by secretion of a hormone called melatonin. Melatonin helps in maintaining the sleep cycle, and menstrual cycle, and protects against neurodegeneration. See “Pineal Gland Function: Ask Health Professionals.” Accessed December 28, 2023. <https://www.msn.com/en-us/health/ask-professionals/expert-answers-on-pineal-gland-function/hp-pineal-gland-function-condition>.

⁵ “Descartes, Rene: Mind-Body Distinction | Internet Encyclopedia of Philosophy.” Accessed December 21, 2023. <https://iep.utm.edu/rene-descartes-mind-body-distinction-dualism/>.

⁶ René Descartes (born March 31, 1596, La Haye, Touraine, France—died February 11, 1650, Stockholm, Sweden) See Descartes René 2017. *Discourse on the Method of Rightly Conducting One's Reason and of Seeking Truth in the Sciences*. Place of publication not identified: Project Gutenberg. <http://api.overdrive.com/v1/collections/v1L1BcAAAAA2A/products/10a90533-2ad8-4344-88b8-c580b70f5203>

⁷ “The Project Gutenberg eBook of Erewhon, by Samuel Butler.” Accessed December 22, 2023. <https://www.gutenberg.org/files/1906/1906-h/1906-h.htm>.

⁸ “Luddite.” In *Wikipedia*, December 14, 2023. <https://en.wikipedia.org/w/index.php?title=Luddite&oldid=1189852986>.

⁹ www.bibliopolis.com. “I, ROBOT Inscribed First Edition by Isaac Asimov on Whitmore Rare Books.” Whitmore Rare Books. Accessed December 22, 2023.

Alan Turing was a British mathematician and computer scientist who made significant contributions to the field of artificial intelligence (AI). Some of his main achievements are:

- He proposed the Turing machine, a theoretical model of computation that can perform any computable task by manipulating symbols on a tape.
- He devised the Turing test, a method for determining whether a machine can exhibit human-like intelligence by engaging in a conversation with a human.
- He worked on the Enigma code, a secret encryption system used by the Nazis during World War II, and helped to break it using an early electronic computer called the Bombe.
- He explored the possibility of machine learning, the idea that machines can learn from experience and improve their own performance, and suggested ways to train artificial neural networks.

Turing is widely regarded as the father of modern computer science and one of the pioneers of AI. His work influenced many later researchers and thinkers in the fields of computing, cryptography, biology, philosophy, and more.¹⁰

The Turing test was proposed by Turing in his 1950 paper “Computing Machinery and Intelligence”¹¹, where he asked the question “Can machines think?” He argued that this question was too vague and ambiguous, and suggested replacing it with a more practical one: “Are there imaginable digital computers which would do well in the imitation game?”

The basic idea of the Turing test is that a human judge engages in a blind text-based conversation with both a human and a machine, and then decides which of the two they believe to be a human. If the judge is unable to distinguish between the human and the machine based on the conversation, then the machine is said to have passed the Turing test.¹²

The term “artificial intelligence” was first coined by John McCarthy, a computer scientist and one of the founders of the field, at the Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI) in 1956.¹³ McCarthy proposed the term “artificial intelligence” as a way

<https://www.whitmorerearebooks.com/pages/books/753/isaac-asimov/i-robot-inscribed-first-edition?soldItem=true>.

¹⁰ Peralta, René. “Alan Turing’s Everlasting Contributions to Computing, AI and Cryptography.” *NIST*, June 23, 2022. <https://www.nist.gov/blogs/taking-measure/alan-turings-everlasting-contributions-computing-ai-and-cryptography>.

¹¹ TURING, A. M. “I.—COMPUTING MACHINERY AND INTELLIGENCE.” *Mind* LIX, no. 236 (October 1, 1950): 433–60. <https://doi.org/10.1093/mind/LIX.236.433>.

¹² GeeksforGeeks. “Turing Test in Artificial Intelligence,” September 30, 2017. <https://www.geeksforgeeks.org/turing-test-artificial-intelligence/>.

¹³ SITNFlash. “The History of Artificial Intelligence.” *Science in the News* (blog), August 28, 2017. <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/>.

to describe the study of “the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it”¹⁴

ELIZA is one of the earliest natural language processing computer programs, created by Joseph Weizenbaum at MIT from 1964 to 1967. It simulated a conversation with a human by using a pattern matching and substitution method, but it did not have any real understanding of what was being said. ELIZA was named after the character Eliza in the musical *My Fair Lady*, and it was best known for imitating a psychotherapist in its DOCTOR¹⁵ script. Many people were surprised and impressed by ELIZA’s responses, and some even attributed human-like feelings to the program. ELIZA is considered an important milestone in the field of artificial intelligence and a precursor of modern chatbots.¹⁶

The impact that artificial Intelligence (AI) is having and will have on genealogical research will be revolutionary. The goal of my three-part presentations is to introduce the areas of this advanced computer processing called artificial Intelligence in a way you can understand how these developments will affect the way we will all do genealogical research in the future. Science fiction writer Arthur C. Clark express the common perception of AI and much of modern technology, in an essay entitled “Hazards of Prophecy: The Failure of Imagination” published in a collection called “Profiles of the Future.”¹⁷ He said, “Any sufficiently advanced technology is indistinguishable from magic.”

Ray Kurzweil, a well-known futurist, and inventor, has proposed the Law of Accelerating Returns.¹⁸ The Law of Accelerating Returns is a concept that describes how the rate of technological change is not constant, but rather increases exponentially over time. This means that the future will be much more different and unpredictable than we can imagine, as new technologies will emerge and transform the world at an accelerating pace.

¹⁴ “Artificial Intelligence.” In *Wikipedia*, December 22, 2023.

https://en.wikipedia.org/w/index.php?title=Artificial_intelligence&oldid=1191310780.

¹⁵ The DOCTOR script simulated a Rogerian psychotherapist, often reflecting back the patient’s words. See “ELIZA.” In *Wikipedia*, December 27, 2023.

<https://en.wikipedia.org/w/index.php?title=ELIZA&oldid=1192037780>.

¹⁶ O’Regan, Gerard. “Eliza Program.” In *The Innovation in Computing Companion: A Compendium of Select, Pivotal Inventions*, edited by Gerard O’Regan, 119–22. Cham: Springer International Publishing, 2018.

https://doi.org/10.1007/978-3-030-02619-6_24.

¹⁷ Clarke, Arthur C. *Profiles of the Future; an Inquiry into the Limits of the Possible*. Rev. ed. New York: Harper & Row, 1973.

¹⁸ <http://kurzweilai.net>. “The Law of Accelerating Returns < the Kurzweil Library + Collections.” Accessed September 16, 2023. <https://www.thekurzweillibrary.com/the-law-of-accelerating-returns>.

According to Kurzweil, the law of accelerating returns applies to any evolutionary process, such as biological evolution, cultural evolution, and technological evolution. He argues that each stage of evolution builds on the previous one, creating new possibilities and opportunities for further development. He also claims that the law of accelerating returns implies that the singularity, a point in time when artificial intelligence will surpass human intelligence and create a new era of superintelligence, is inevitable and will happen in the 21st century.

Some examples of the law of accelerating returns in action are:

- The exponential growth of computing power, as described by Moore’s law, which states that the number of transistors on a chip doubles every two years. According to this law, technological change is exponential, contrary to the common-sense “intuitive linear” view. This means that we won’t experience 100 years of progress in the 21st century -- it will be more like 20,000 years of progress (at today’s rate).
- The exponential growth of information and knowledge, as shown by the increasing number of scientific discoveries, patents, publications, and internet data.
- The exponential growth of biotechnology, nanotechnology, and other emerging fields, which enable new applications and breakthroughs in medicine, engineering, and other domains.

The law of accelerating returns is a controversial and debated idea, as some critics question its validity, assumptions, and implications. Some of the challenges and issues raised by the law of accelerating returns are:

- The possibility of technological stagnation, slowdown, or reversal, due to physical limits, ethical concerns, social conflicts, or environmental problems.
- The uncertainty and unpredictability of the future, as the law of accelerating returns makes it difficult to foresee the consequences and risks of new technologies and their impact on humanity and the world.
- The ethical and moral dilemmas posed by the law of accelerating returns, such as the value and meaning of human life, the rights and responsibilities of artificial intelligence, and the role and purpose of humanity in the universe.

To begin to understand why AI technology will have an inevitable impact on genealogy and genealogical research, I first need to focus on some definitions of the commonly used terms.

Artificial Intelligence or AI¹⁹

AI is usually defined as the ability of a computer system to perform tasks that normally require human intelligence, such as recognizing speech, making decisions, and identifying patterns. AI is a broad term that covers many different technologies, such as machine learning, deep learning,

¹⁹ Coursera. “What Is Artificial Intelligence? Definition, Uses, and Types,” November 2, 2023. <https://www.coursera.org/articles/what-is-artificial-intelligence?isNewUser=true&showOnboardingModal=1>.

and natural language processing. AI is used in many applications today, such as chatbots, voice assistants, self-driving cars, and recommender systems.

The objective of AI is to use computer programs to help organize, analyze, and get insight from data to solve novel problems. Does this sound anything like genealogical research?

Cognitive Computing²⁰

Cognitive computing is a type of artificial intelligence that simulates human thought processes and reasoning. It involves machines that can learn, reason, and understand language in a way that is like how humans think. Cognitive computing systems can also adapt and make decisions based on new information and feedback.

Some examples of cognitive computing applications are:

- IBM Watson, a cognitive computing platform that can answer questions, analyze data, and provide insights across various domains.
- Google Duplex, a system that can make natural-sounding phone calls to book appointments or make reservations on behalf of users.
- Amazon Alexa, a virtual assistant that can respond to voice commands, play music, control smart devices, and more.

Cognitive computing is considered an important and promising field of artificial intelligence, as it can enhance human capabilities and enable more complex and intelligent interactions between humans and machines.

Computer Vision²¹

Computer vision is a field of artificial intelligence that enables computers and systems to derive meaningful information from digital images, videos, and other visual inputs — and take actions or make recommendations based on that information. If AI enables computers to think, computer vision enables them to see, observe, and understand.

Some of the tasks that computer vision can perform are:

- Scene reconstruction: creating a 3D model of a scene from multiple images or videos.
- Object detection: locating and identifying objects in an image or video.
- Event detection: recognizing and classifying events or activities in an image or video.
- Activity recognition: inferring the actions or intentions of humans or animals in an image or video.

²⁰ “What Is Cognitive Computing? | Built In.” Accessed December 23, 2023. <https://builtin.com/artificial-intelligence/cognitive-computing>.

²¹ “What Is Computer Vision? | IBM.” Accessed December 23, 2023. <https://www.ibm.com/topics/computer-vision>.

- Video tracking: following the movement of objects or features in a video.
- Object recognition: matching an object in an image or video to a known category or label.
- 3D pose estimation: estimating the position and orientation of a 3D object in an image or video.
- Learning: improving the performance or accuracy of computer vision models by using data and feedback.
- Indexing: organizing and retrieving images or videos based on their content or features.
- Motion estimation: estimating the motion or velocity of objects or features in an image or video.
- Visual servoing: using a servo to control the movement of a robot or a camera based on visual feedback.
- 3D scene modeling: creating a realistic representation of a 3D scene from images or videos.
- Image restoration: enhancing or restoring the quality of an image or video.

Computer vision is used in many industries and applications, such as healthcare, manufacturing, security, entertainment, education, and more. It is considered an important and promising field of artificial intelligence, as it can enhance human capabilities and enable more complex and intelligent interactions between humans and machines.

Neural Networks²²

Neural networks, also known as artificial neural networks (ANNs) or simulated neural networks (SNNs), are a subset of machine learning and are at the heart of deep learning algorithms. Their name and structure are inspired by the human brain, mimicking the way that biological neurons signal to one another.

Artificial neural networks (ANNs) are comprised of node layers, containing an input layer, one or more hidden layers, and an output layer. Each node, or artificial neuron, connects to another and has an associated weight and threshold. If the output of any individual node is above the specified threshold value, that node is activated, sending data to the next layer of the network. Otherwise, no data is passed along to the next layer of the network.

Neural networks rely on training data to learn and improve their accuracy over time. However, once these learning algorithms are fine-tuned for accuracy, they are powerful tools in computer science and artificial intelligence, allowing us to classify and cluster data at a high velocity. Tasks in speech recognition or image recognition can take minutes versus hours when compared to the manual identification by human experts.

Think of each individual node as its own linear regression model, composed of input data, weights, a bias (or threshold), and an output. The formula would look something like this:

²² “What Are Neural Networks? | IBM.” Accessed December 23, 2023. <https://www.ibm.com/topics/neural-networks>.

$$\sum w_i x_i + \text{bias} = w_1 x_1 + w_2 x_2 + w_3 x_3 + \text{bias}$$

The output is then passed through an activation function, which determines the output. If that output exceeds a given threshold, it “fires” (or activates) the node, passing data to the next layer in the network. This results in the output of one node becoming in the input of the next node. This process of passing data from one layer to the next layer defines this neural network as a feedforward network.

Deep Learning (DL)²³

Deep learning is a subset of machine learning methods based on artificial neural networks with representation learning. The term “deep” refers to the use of multiple layers in the network. Deep learning algorithms can be supervised, semi-supervised, or unsupervised.

Deep learning architectures such as deep neural networks, deep belief networks, recurrent neural networks, convolutional neural networks, and transformers have been applied to various fields including computer vision, speech recognition, natural language processing, machine translation, bioinformatics, drug design, medical image analysis, climate science, material inspection, and board game programs. They have produced results comparable to and in some cases surpassing human expert performance.

Natural Language Processing (NLP)²⁴

Natural Language Processing (NLP) is a branch of AI that focuses on enabling computers to understand and process human language. It combines computational linguistics, which is rule-based modeling of human language, with statistical, machine learning, and deep learning models.

NLP is used in a variety of applications, including but not limited to:

- Translation: Translating text from one language to another.
- Speech Recognition: Converting voice data into text data.
- Sentiment Analysis: Understanding the speaker or writer’s intent and sentiment.
- Chatbots: Powering customer service chatbots.
- Information Extraction: Extracting information and insights from large volumes of text.

However, human language is filled with ambiguities and irregularities, making it challenging for NLP systems to accurately determine the intended meaning of text or voice data. These challenges include homonyms, homophones, sarcasm, idioms, metaphors, grammar and usage exceptions, and variations in sentence structure.

²³ “What Is Deep Learning? | Microsoft Azure.” Accessed December 28, 2023. <https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-deep-learning>.

²⁴ “What Is Natural Language Processing? | IBM.” Accessed December 28, 2023. <https://www.ibm.com/topics/natural-language-processing>.

Fuzzy Logic

Fuzzy logic is a form of many-valued logic where the truth value of variables may be any real number between 0 and 1. It is used to handle the concept of partial truth, where the truth value may range between completely true and completely false. This contrasts with Boolean logic, where the truth values of variables may only be the integer values 0 or 1.

Fuzzy logic is based on the observation that people make decisions based on imprecise and non-numerical information. Fuzzy models or fuzzy sets are mathematical means of representing vagueness and imprecise information. These models have the capability of recognizing, representing, manipulating, interpreting, and using data and information that are vague and lack certainty.

Fuzzy logic has been applied to many fields, from control theory to artificial intelligence. It allows for more advanced decision-tree processing and better integration with rules-based programming. It is designed to solve problems by considering all available information and making the best possible decision given the input.

Expert Systems²⁵

In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning through bodies of knowledge, represented mainly as if-then rules rather than through conventional procedural code.

An expert system is divided into two subsystems: the inference engine and the knowledge base. The knowledge base represents facts and rules. The inference engine applies the rules to the known facts to deduce new facts. Inference engines can also include explanation and debugging abilities.

Expert systems were among the first truly successful forms of AI software. They can advise users as well as provide explanations to them about how they reached a particular conclusion or advice. They are widely used in many areas such as medical diagnosis, accounting, coding, games etc.

For example, MYCIN was one of the earliest expert systems based on backward chaining. It can identify various bacteria that can cause severe infections and can also recommend drugs based on the person's weight.

Robotics²⁶

²⁵ GeeksforGeeks. "Expert Systems," August 2, 2018. <https://www.geeksforgeeks.org/expert-systems/>.

²⁶ "Robotics." In *Wikipedia*, December 27, 2023. <https://en.wikipedia.org/w/index.php?title=Robotics&oldid=1192102262>.

Robotics is an interdisciplinary field that involves the design, construction, operation, and use of robots¹. It integrates many fields that deal with specific aspects of robotics. For example, within mechanical engineering, the term robotics refers to the construction of the physical structures of a robot, while in computer science, robotics focuses on the study of robotic software.

The goal of robotics is to design machines that can help and assist humans. Robots can be used in many situations for many purposes, but today many are used in dangerous environments (including inspection of radioactive materials, bomb detection and deactivation), manufacturing processes, or where humans cannot survive (e.g., in space, underwater, in high heat, and clean up and containment of hazardous materials and radiation).

Robots can take any form, but some are made to resemble humans in appearance. This is claimed to help in the acceptance of robots in certain replicative behaviors that are usually performed by people. Certain robots require user input to operate, while other robots can function autonomously.

AI has been used for many years. You might recognize a few practical ways AI is currently being used:

- **Illegal Activities Detection:** AI is being used to help crack down on illegal activities. For example, it is helping to tackle overfishing in our oceans.
- **Human Trafficking:** AI-powered tools like Artemis are being used to tackle human trafficking.
- **Business Applications:** AI is being used in customer service, cybersecurity and fraud management, customer relationship management, digital personal assistants, inventory management, and content production.
- **Everyday Life:** AI impacts our lives daily through FaceID on iPhones, the search algorithm on Google, recommendation algorithms on Netflix, social media, digital assistants like Alexa, and ride-hailing apps such as Uber.
- **Generative AI:** Generative AI tools are being used in various business functions. These tools have seen explosive growth and are being adopted by companies.
- **Data Processing:** AI is used in self-driving cars, smart assistants, disease mapping, manufacturing robots, and virtual travel booking agents.

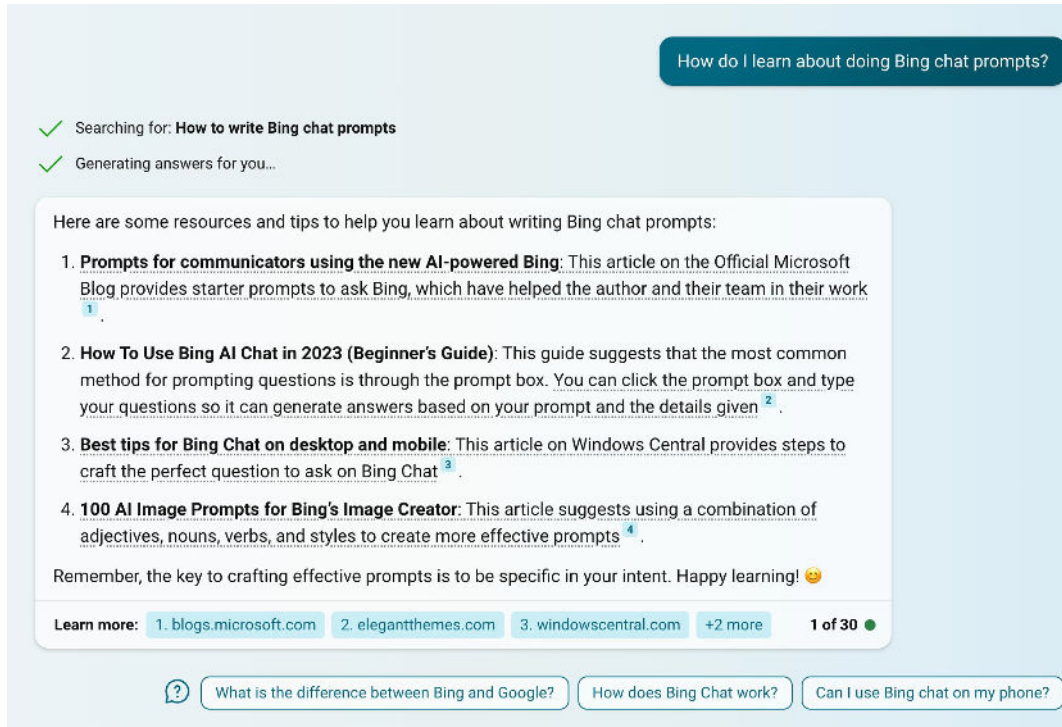
What is happening today is a result of three factors:

- A complex theory of how our brains think called Neural Networking
- A dramatic increase in computing power from storage capacity and speed of computation
- Huge amounts of organized and labeled data in what are called Large Language Models.

Large language models (LLMs) are machine learning models that aim to predict and generate plausible language by processing huge databases of natural language. A chatbot (or chat) program can use a large language model to produce responses, but a large language model can also be used for other purposes, such as generating code, poetry, or summaries. LLMs are possible because of advancements in the size and capacity of super computers. At the time of this

Syllabus, the largest supercomputer was at the Oak Ridge National Laboratory. Quoting from the laboratory's website²⁷

Gemini, Googles Chatbot.²⁸



MyHeritage.com announced two chatbot-based developments in December, 2023.

²⁷ Oak Ridge Leadership Computing Facility. "ORNL Celebrates Launch of Frontier – the World's Fastest Supercomputer." Accessed January 1, 2024. <https://www.olcf.ornl.gov/2022/08/17/ornl-celebrates-launch-of-frontier-the-worlds-fastest-supercomputer/>.

²⁸ "Bard/Gemini - Chat Based AI Tool from Google." Accessed January 1, 2024. <https://Bard/Gemini.google.com>.



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Introducing

AI Biographer™

Create a Wikipedia-like biography for any ancestor using AI, enriched with historical context

myheritage.com

See the MyHeritage blog for more information.²⁹

²⁹ MyHeritage Blog. "MyHeritage Blog." Accessed January 1, 2024. <https://blog.myheritage.com/>.

The computerization of genealogy began slowly with the computerization of some of the records in the FamilySearch Library. In the summer of 1987, the LDS Church's genealogical library quietly celebrated the conversion of its last catalog card to a computer file.³⁰ FamilySearch began digitizing its collection of microfilm in 1938 as the Genealogical Society of Utah. It completed the digitization of its massive microfilm collection in September 2021, making billions of historical genealogy records freely available online³¹.

The FamilySearch.org website went online in May of 1999 and almost immediately crashed. The website hosted over 236 million views in 2023. Ancestry.com was launched in 1997³² and does not publish its website traffic count but it is the number one visited genealogy website with FamilySearch.org in second and MyHeritage.com³³ in third. MyHeritage began in 2003.

We now take the computerization of billions of genealogical records as a matter of course.

Even with billions of records being digitized every year by the major genealogical records websites, there are still a huge number of records that remain to be digitized or are unavailable due to various access issues. Genealogists still face a daunting task of finding useful records even if the records are indexed and located on one of the major websites. Contributors to the difficulties include partial indexing rather than every word indexing and firewalls. Many valuable record collections are scattered across the world but are only available by subscribing to certain websites. In addition, although handwriting recognition is becoming increasingly available, it will be some time before it is generally available to individual genealogists other than through the auspicious of major subscription websites.

Genealogy and AI share a common objective, to organize, analyze, and develop insights into data to help solve novel problems.

The advances in AI are based on machine learning models (large databases of natural language) now called Large Language Models (LLMs)³⁴ that aim to predict and generate plausible

³⁰ <https://www.deseret.com/authors/trent-toone>. "How Technology Revolutionized Family History Work in Recent Decades." Deseret News, March 28, 2017. <https://www.deseret.com/2017/3/28/20609372/how-technology-revolutionized-family-history-work-in-recent-decades>.

³¹ FamilySearch Newsroom. "FamilySearch Completes Digitization of Massive Microfilm Collection • FamilySearch Newsroom." Accessed January 13, 2024. <https://www.familysearch.org/en/newsroom/familysearch-completes-digitization-of-massive-microfilm-collection>.

³² "Ancestry.Com." In *Wikipedia*, January 2, 2024. <https://en.wikipedia.org/w/index.php?title=Ancestry.com&oldid=1193263708>.

³³ Gobry, Pascal-Emmanuel. "How A Startup No One Would Touch Crushed Silicon Valley Moguls And Became A Giant." Business Insider. Accessed January 13, 2024. <https://www.businessinsider.com/myheritage-story-gilad-japhet-2011-7>.

³⁴ "Large Language Models: The Foundations of Generative AI | InfoWorld." Accessed November 15, 2023. <https://www.infoworld.com/article/3709489/large-language-models-the-foundations-of-generative-ai.html>.

language. The programs that responds to questions and carry on conversations are called chatbots. The chatbots use the large language models for responses. The general term for the user submitted questions or commands are called “prompts³⁵.” Crafting prompts has become a sub-skill in using chatbots.

There are a lot of chatbot programs. The main chatbot programs have been Microsoft Copilot³⁶, ChaptGPT³⁷, and Google Gemini³⁸. However, chatbots are proliferating rapidly.

For more than ten years, AI has already been used by genealogy websites and programs. Here are some of the ways it is being used.

- To answer questions about historical events, places, dates, and genealogy resources.
- To translate text and speech from one language to another.
- To enhance and colorize old photos, animate faces, and estimate ethnic origins based on DNA tests.
- To index records, suggest record hints, and create family trees.
- To match DNA results, generate personal discoveries, and create interactive stories based on family history.

FamilySearch.org, MyHeritage.com, and Ancestry.com are all in various stages of implementing AI features and in the next year, almost everything you know and read about AI will change.

³⁵ “How to Write AI Art Prompts for Realistic Results.” Accessed January 15, 2024. <https://shotkit.com/write-ai-art-prompts/>.

³⁶ “Google Translate.” In *Wikipedia*, January 11, 2024. https://en.wikipedia.org/w/index.php?title=Google_Translate&oldid=1194871015.

³⁷ “ChatGPT.” In *Wikipedia*, January 13, 2024. <https://en.wikipedia.org/w/index.php?title=ChatGPT&oldid=1195381493>.

³⁸ “Bard/Gemini (Chatbot).” In *Wikipedia*, January 14, 2024. [https://en.wikipedia.org/w/index.php?title=Bard/Gemini_\(chatbot\)&oldid=1195531648](https://en.wikipedia.org/w/index.php?title=Bard/Gemini_(chatbot)&oldid=1195531648).

Using Artificial Intelligence Tools to Expand Your Genealogical Research Universe

By James L. Tanner



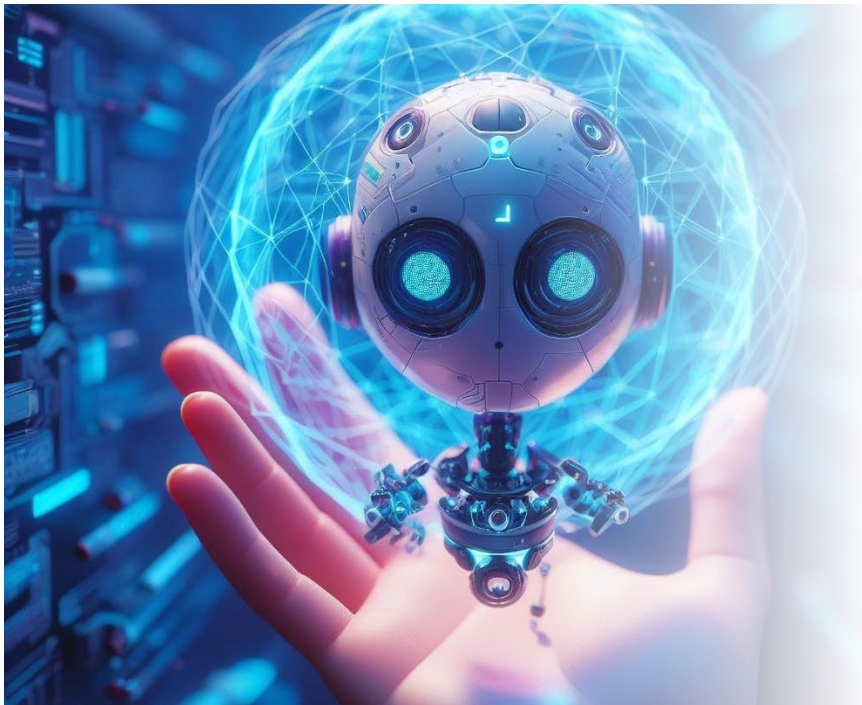
Most of the images in this presentation were created using generative imaging.





Many genealogists are still stuck in a paper-based world.

Are you ready for an AI future?



The impact that artificial Intelligence (AI) is having and will have on genealogical research will be revolutionary.

“Any sufficiently advanced technology is indistinguishable from magic”

Clarke, Arthur C. (1962). “Hazards of Prophecy: The Failure of Imagination”. In Profiles of the Future.

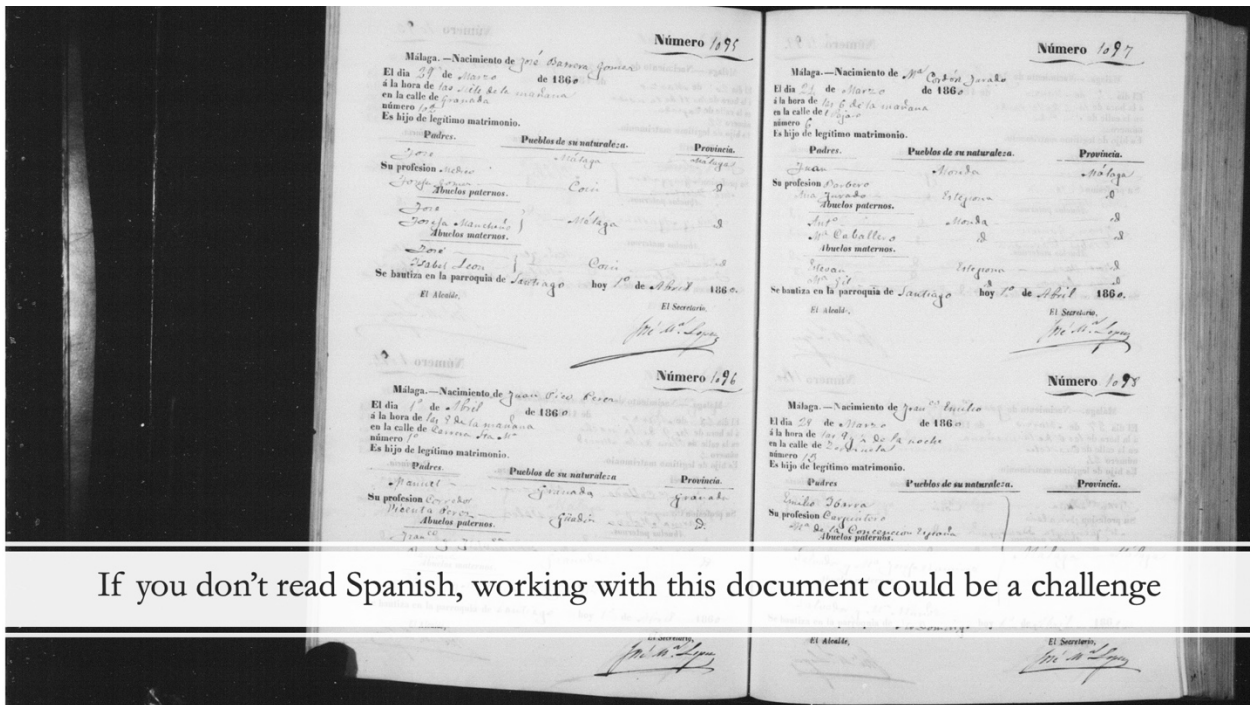
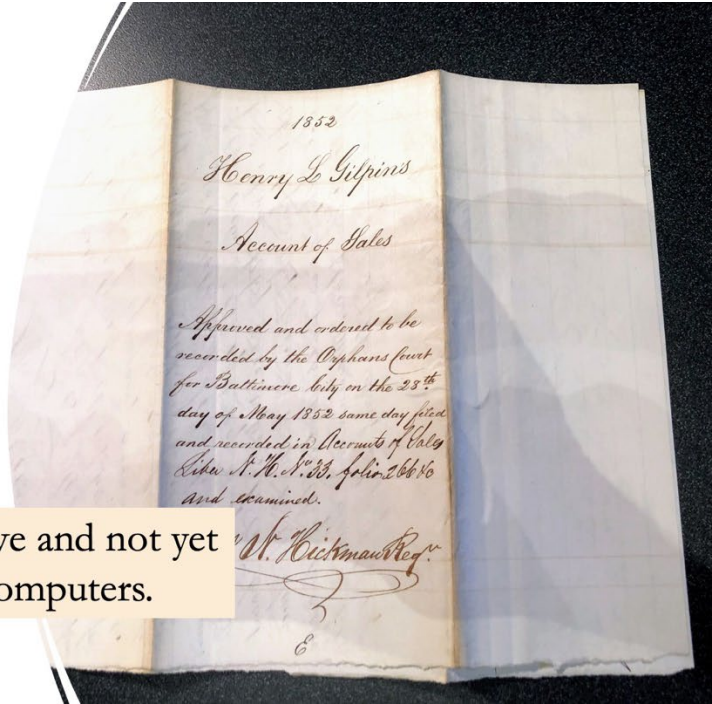


For more than ten years, AI has already been used by genealogy websites and programs. Here are some of the ways it is being used.

- To answer questions about historical events, places, dates, and genealogy resources.
- To translate text and speech from one language to another.
- To enhance and colorize old photos, animate faces, and estimate ethnic origins based on DNA tests.
- To index records, suggest record hints, and create family trees.
- To match DNA results, generate personal discoveries, and create interactive stories based on family history.

Handwriting recognition has recently matured into an accurate tool.

But it is memory intensive and not yet practical for individual computers.



If you don't read Spanish, working with this document could be a challenge


This is an attempt by Google Gemini to read the text and some of the handwriting of this Spain, Málaga, Municipal Birth Records from MyHeritage.com.

I test the accuracy of any AI effort with information I can already translate or already know.

Gemini

Gemini was just updated. See update

can you translate the text portions of this document



Show drafts

The document you sent is a partial baptismal record from Spain. It appears to be from the 19th century. Here's a translation of the visible text:

- Número (Number): 195, 1097, 191
- **Milagro (Miracle)**
- **Naacimiento (Birth)**
- de (of)
- Don (Lord)
- Doña (Lady)
- Hijo/Hija de legítimo matrimonio (Son/Daughter of legitimate marriage)
- Padres (Parents)
- Pueblos de su naturaleza (Places of natural origin)
- Provincia (Province)
- Profesión (Profession)
- Se bautizó en la parroquia de (Baptized in the parish of)
- Sa (his/her)
- Casada (Married)
- Con (With)
- Soltera (Single)

Without additional context, it is impossible to determine the complete meaning of the document.

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Additional useful information from Gemini.

tell me about the Santiago parish in Malaga Spain

Show drafts

The Santiago parish in Malaga, Spain is home to the Iglesia de Santiago, which holds the distinction of being the oldest church in Malaga [visita malaga church santiago].

Here's some interesting information about the Santiago parish and its church:

- **History:** Founded in 1490, the church was built on the site of a former mosque [GPSmyCity iglesia de santiago apostol malaga].
- **Architectural Style:** The facade and tower showcase the Mudéjar style, a blend of Islamic and Christian elements [visita malaga church santiago]. The interior has a mix of Gothic and Mudéjar influences [visita malaga church santiago].
- **Art and Relics:** The church houses valuable artworks by artists like Alonso Cano and Niño de Guevara [visita malaga church santiago]. It's also known for its sculpture of Our Lady of Love and Jesus the Rich [visitcostadelsol church of santiago].
- **Famous Parishioner:** Interestingly, the famed artist Pablo Picasso was baptized at this church in 1881 [GPSmyCity iglesia de santiago apostol malaga].

If you're interested in learning more about the Santiago parish and the church, you can search online using the keywords "Iglesia de Santiago Malaga".

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Meanwhile, companies are beginning to implement AI search apps.

The MyHeritage.com AI Record Finder™

Welcome to

MyHeritage Home Family tree Discoveries Photos DNA **Research**

ng DNA Sale Close
and shipping on 2+ kits

- Search all records
- AI Record Finder™**
- Collection Catalog
- Birth, Marriage & Death
- Census records
- Family trees
- Newspapers
- Immigration records
- Hire a researcher

Search historical records
Explore your family history in MyHeritage's database of 20.0 billion historical records




Search Chat BETA

First and middle name(s) Last name Year of birth Place

➤

tell me about Harold Morgan b. 1892. d. 1963

Here are the results found for the information you provided:


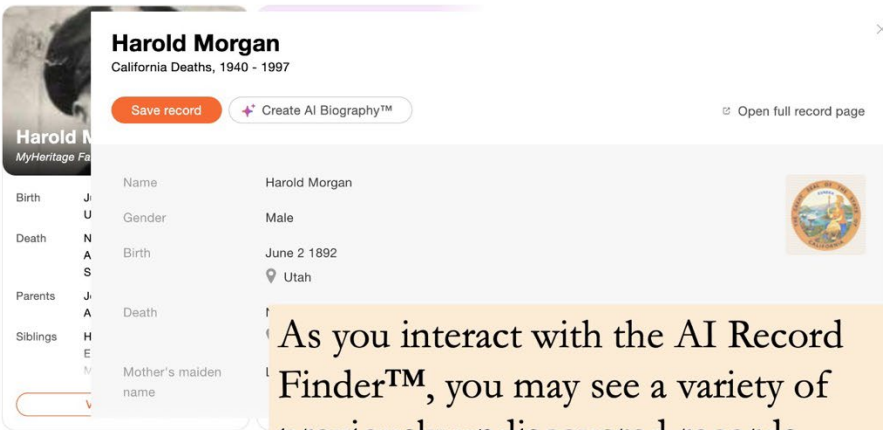
 <p>Harold Morgan MyHeritage Family Trees</p> <p>Birth: June 2 1892 - Nephi, Juab, Utah, United States</p> <p>Death: Nov 1 1963 - Pasadena, Los Angeles, California, United States</p> <p>Parents: John Hamilton Morgan, Mary Ann Morgan / Udall (born Linton)</p> <p>Siblings: Helen Melvina Burt Austin (born Morgan), Eliza Ann</p> <p>View full record</p>	 <p>Harold Morgan MyHeritage Family Trees</p> <p>Birth: June 2 1892 - Nephi, Juab, Utah, United States</p> <p>Death: Nov 1 1963 - Pasadena, Los Angeles, California, United States</p> <p>Parents: John Hamilton Morgan, Mary Ann Morgan (born Linton)</p> <p>Siblings: Richard Linton (Lin) Morgan, Mathias Crowley Morgan</p> <p>View full record</p>	 <p>Harold Francis Morgan FamilySearch Family Tree</p> <p>Birth: Mar 29 1892 - Boston, Suffolk, Massachusetts, United States</p> <p>Parents: John Richard Morgan, Mary Ann Morgan (born Hickey)</p> <p>Wife: Vera Maud Watt</p> <p>Siblings: Anna Louise Shanks (born Morgan), Mary J Tracy (born ...)</p> <p>View full record</p>
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Use the information provided to form further prompts with more detail.

To refine the search results, please provide additional details such as specific locations, names of close relatives, or any other relevant life events associated with Harold Morgan.

Harold Morgan Birth
June 2 1892 - Nephi, Juab, Utah, United States

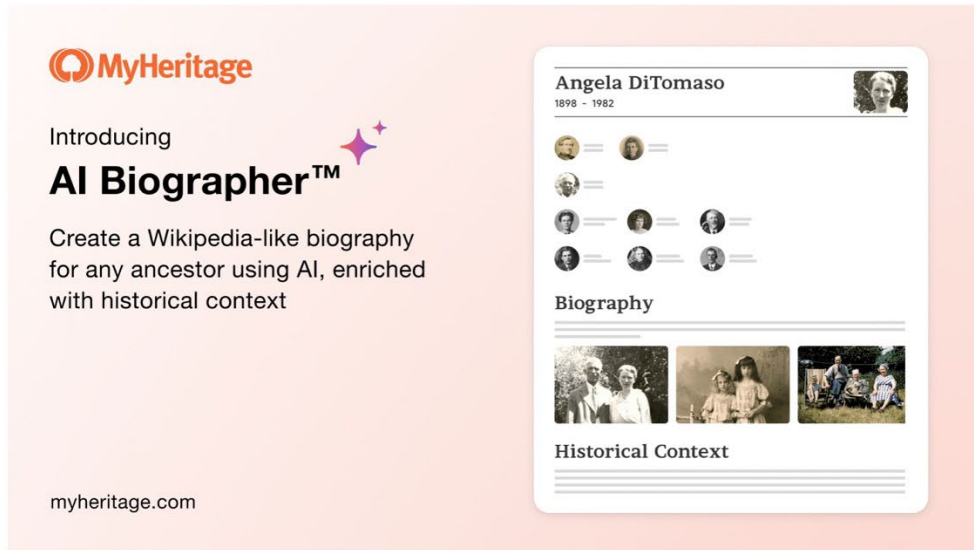
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 <p>Harold Morgan MyHeritage Family Trees</p> <p>Birth: June 2 1892 - Nephi, Juab, Utah, United States</p> <p>Death: Nov 1 1963 - Pasadena, Los Angeles, California, United States</p> <p>Parents: John Hamilton Morgan, Mary Ann Morgan / Udall (born Linton)</p> <p>Siblings: Helen Melvina Burt Austin (born Morgan), Eliza Ann</p> <p>View full record</p>	 <p>Harold Morgan California Deaths, 1940 - 1997</p> <p>Save record Create AI Biography™ Open full record page</p> <p>Name: Harold Morgan</p> <p>Gender: Male</p> <p>Birth: June 2 1892 Utah</p> <p>Death:</p> <p>Siblings: H, E, M</p> <p>Mother's maiden name:</p>
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As you interact with the AI Record Finder™, you may see a variety of previously undiscovered records showing up.

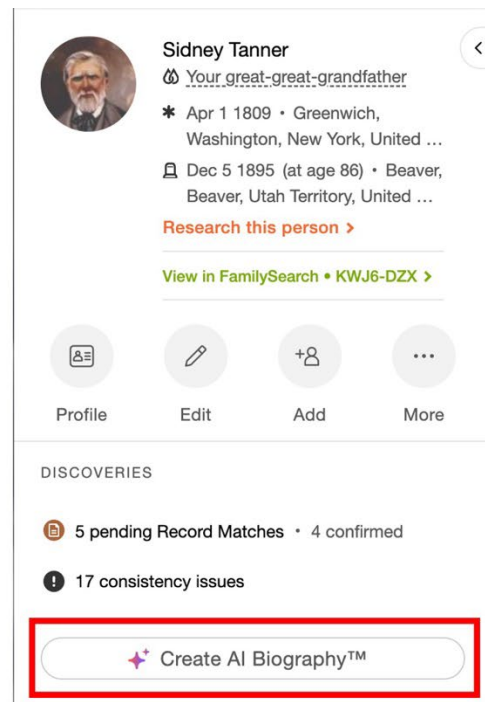
To further refine the search, please provide additional details such as names of close relatives, specific locations, or any other relevant life events associated with Harold Morgan.

Another addition to the MyHeritage AI features is the AI Biographer™




You can choose a person from your family tree and ask to create an AI Biography™

It is a good idea to attach all the pending Record Matches and Record Hints before creating the biography.



Review match ✕



Salt Lake Herald-Republican - Dec 7 1895
 United States Newspapers from OldNews.com™ ?

Text	"...session. FATHER TANNER DEAD. (Special to The Herald.) BEAVER, Utah. Dec. 6 - Father
Publication title	Salt Lake Herald-Republican
Publication place	Salt Lake City, Salt Lake, Utah, USA
Date	Dec 7 1895
Page	1

[View full record](#)

Here is a new pending Record Match from the new MyHeritage OldNews.com™ website.


Record Matches and Record Hints on MyHeritage.com are also AI generated.

MyHeritage Home Family tree Discoveries Photos DNA Research

Matches by people > Sidney Tanner >
Review match

Sidney Tanner from your family tree was found in a historical record. Confirm Match

In your tree



Sidney Tanner
 Great-great-grandfather

Birth: Apr 1 1839 - Graceland, Washington, New York, United States
 Death: Dec 5 1895 - Beaver, Beaver, Utah Territory, United States
 Parents: John "Father Tanner" Tanner and

[View profile](#) | [View in tree](#)

In United States Newspapers from OldNews.com™


Salt Lake Herald-Republican - Dec 7 1895

Publication: Salt Lake City, Salt Lake, Utah, USA

Date: Dec 7 1895

Page: 1

Text: "...session. FATHER **TANNER** DEAD. (Special to The Herald.) BEAVER, Utah. Dec. 6 - Father

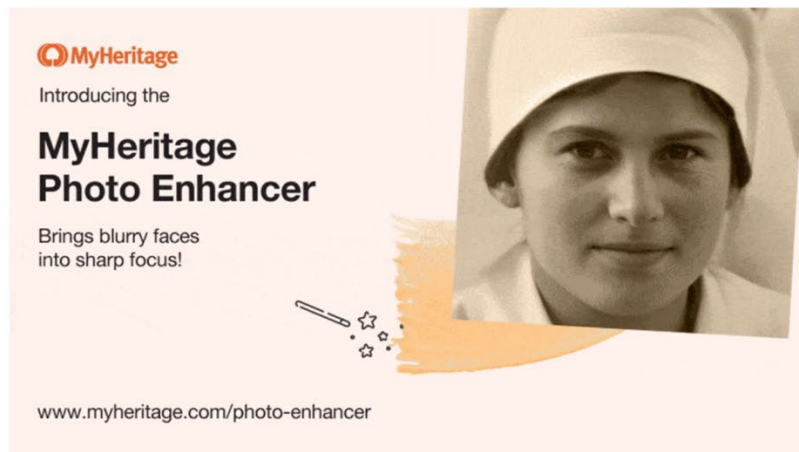


[View full newspaper page](#) on OldNews.com (included in your plan)

If this match is incorrect, [reject it](#) Print

When you are ready, an AI Biography™ will be created and a notice will be sent to you by email.

In 2020, MyHeritage.com introduced an AI-driven image enhancing app on their website. Since that first introduction, the functions of the photo enhancement app was expanded to include repairing, restoring colors, and animating the individuals.



Using AI from the MyHeritage.com website, this is what can be done today.



How about some of these problems.



MyHeritage was substantially ahead of the current explosion in generated imagery. Adobe Photoshop followed.



AI is limited to the information that is contained in the image. Here is another example from MyHeritage.com.



Repaired by MyHeritage



Enhanced by MyHeritage



Colorized by MyHeritage

It is interesting to see what happens, but you may or may not like the results.



Here is a sample of the same photo when I spent some time with Adobe Photoshop.



Both MyHeritage and Photoshop use AI but the results are different.



MyHeritage



Adobe Photoshop

Another topic, photo tagging using facial recognition.

Photo Tagger

The Photo Tagger lets you tag people in your photos quickly and easily. This feature clusters the faces of the same person appearing in multiple photos, and lets you tag them all in one go.

Start



MyHeritage Home Family tree Discoveries Photos DNA Research

Photo Tagger

All Identified people Unidentified people

Review 13 groups of photos to tag

Margaret Godfrey Jarvis Great-grandmother 1879 - 1968		Review
Della Randall Father's aunt 1914 - 2002		Review
Stephen Robert Wells Mother-in-law's uncle 1900 - 1979		Review
Ellen Hancock 3000's great-grandmother's great-grandmother's 1812 - 1885		Review
Who is this?		Review

Animate photos from MyHeritage.com



MyHeritage.com
Deep Story



Look for many new
innovations in the future.



Thanks for Watching

