



Introduction to The Time Machine Large-Scale Research Initiative

The Time Machine is an international collaborative project that builds a Large Scale Historical Simulator mapping thousands of years of European history.

It brings together academic research teams, public organisations and industrial players from all over Europe. With the expertise of over 200 institutions ranging from major European museums to leading companies in digitisation and artificial intelligence, Time Machine aims to process millions of historical documents, paintings, landscapes and monuments to become the largest historical computer simulation ever developed.

First proposed to the European Commission in April 2016, the project was initially anchored in the Venice Time Machine, a proof-of-concept model using digitised archival records to show the city's evolution. It now comprises of many other Time Machines across Europe including Amsterdam, Paris, Antwerp, Budapest and Jerusalem.

As a free-to-use public resource, Time Machine aims to be the most interactive and detailed historical, scientific, and educational tool ever created, revolutionising how universities, policymakers, urban planners and the wider global community experience European history and culture. Capitalizing on Europe's Big Data of the Past as a unique, shared resource for co-creating its future, Time Machine paves the way for developing a digitization tool of global heritage.

Background to the Time Machine Project

What is the Time Machine Project?

Time Machine is by far the most ambitious, far-reaching project ever undertaken using Big Data of the Past. It is based on an information infrastructure that processes millions of historical documents, museum collections, geo-historical datasets, as well as the growing amount of 'digitally native' heritage produced today. In doing so, it helps simulate possible futures and past scenarios with predictive techniques and interactive 3D visualisations. It aims to bring a new era of open access to sources, where past and on-going research will become open sciences. This constant source of new knowledge will be an economic motor, giving rise to new professions, new services and new products, impacting education, cultural heritage, creative industries, policy making, and economic, societal and environmental modelling.

Why Europe?

Time Machine is based on Europe's unique assets: its long history, multilingualism and multiculturalism. Through investing in cutting-edge technology in artificial intelligence and machine learning, the project marries the continent's rich past with its new future in digital breakthrough. Time Machine thus brings together European research institutions, cultural heritage stakeholders, decision makers, businesses and the general public in a unique endeavour: turning the history of Europe into a living resource for co-creating its future.

Why is Time Machine important?

Time Machine is preserving Europe's valuable cultural heritage by transforming it into an everyday, living resource. The project promises to revolutionise education, culture, media, tourism, policymaking and legislation, urban planning, and environmental modelling, pushing the boundaries of science and technology.

The Time Machine aims to strengthen cohesion across Europe by giving social and political actors access to their common transnational heritage. With a growing public interest in personal history and cultural tourism, Time Machine contextualises history through advanced AI and locally curated data. This project ultimately renews the relevance and applications of previously inaccessible historical data.

The project also helps modernise the institutions that archive and transmit Europe's rich history. By scanning historical documents and providing ways to process them, Time Machine helps connect the research spheres of history and humanities with science and technology.

How are we creating the Time Machine?

Massive digitisation infrastructures and high-performance computing will be coupled with machine learning techniques to produce a multi-scale simulation of several thousand years of history. To do this, Time Machine relies on developing a large-scale digitisation and computing infrastructure that transforms kilometres of archives, museum collections and other geo-historical datasets into a vast information system. Users will also be able to interact with Time Machine through various interfaces tailored to their needs and profiles – ranging from advanced search engines for scholars to immersive 3D environments for virtual exploration. To succeed, Time Machine has targeted a series of fundamental breakthroughs in artificial intelligence, robotics and IT, which will boost Europe's stake in these technologies.

Who is part of Time Machine?

Time Machine promotes a unique alliance of leading European academic and research organisations, cultural heritage institutions and private enterprises. Coordinated work in recent years has led to the creation of the **Time Machine Ecosystem** that comprises of more than **300 organisations** from **34 countries**. This includes:

Europe's top-level **academic and research expertise**: A total of 95 academic and research institutions aiding the project's key science and technology challenges.

- Innovative scanning and robotics (EPFL, Fraunhofer, TU Dresden)
- AI and machine learning (Inria, FAU, CVC, TU Wien, TU Dortmund, UCL, U. Oxford, IGN, U. Amsterdam, EPFL)
- High-performance computing (PSNC, CWI)
- Semantic information extraction from heterogeneous historical sources (CWI, EPFL, FAU, IRHT-CNRS, École des Ponts – ParisTech, TU Dortmund, U. Amsterdam, U. Bologna)
- Advanced multimodal information modelling (FIZ Karlsruhe, IGN, TU Delft) and innovative interfaces for the exploitation of this information (FIZ Karlsruhe, Netherlands Institute for Sound and Vision, TU Dresden)
- Urban history and the built environment (Bar-Ilan University, Ca' Foscari, École Nationale des Chartes, U. Gent, TU Delft, U. Amsterdam, U. Antwerp)
- Spatial/geographical modelling, registration methods and semiology (IGN, TU Wien, EuroSDR)

- Digital humanities (KNAW, CLADA-BG, EPFL, IRHT-CNRS, TU Dresden, U. Amsterdam, U. Luxemburg, U. Warsaw, U. Utrecht, U. Gent, U. Antwerp, FAU, UCL, U. Oxford).

Galleries, libraries, archives and museums: Providing cultural, historical and geographic material and expertise.

- Europeana (a network of more than 3500 institutions and 53 million cultural documents)
- ICARUS (the international association of more than 170 European archives and similar institutions, and including EUscreen, the European network of more than 30 audiovisual archives)
- 20 European state archives
- 8 national libraries (Austria, Belgium, France, Israel, Netherlands, Norway, Spain, Switzerland)
- 6 key city archives (Paris, Venice, Amsterdam, Budapest, Antwerp, Sarajevo)
- Prestigious museums (the Louvre, the Rijksmuseum, the Belgian Royal Museums of Art and History, Belvedere Museum Vienna, German National Museum)

Private sector partners: Contributing to the development of Time Machine's structure and/or services:

- The best European SMEs in developing technologies for cultural heritage (Picturae, Iconem, Ontotext, Klokkan)
- Large-scale industrial partners (Ubisoft, INDRA, Thales, Naver Labs)

Institutional bodies:

- The Italian Ministry of Culture and the French Ministry of Ecological Transition and Solidarity
- The Regional Office for Science and Culture in Europe of UNESCO
- National cultural heritage agencies (Belgium, the Netherlands and more)

Civil society and industry associations:

- Europa Nostra
- The Big Data Value Association

Who will benefit from Time Machine?

As an open access, comprehensive database of Europe's past, Time Machine creates a knowledge network of cultural history that will aid everyone from academics to industry to society as a whole.

Research institutions: Time Machine will revolutionise research by providing access to valuable cultural, historical and geographical data. This streamlines the ability to search for information, saving time and resources. For younger audiences, Time Machine provides new, interactive teaching material that should hopefully spark interest in the future generation of humanities scholars.

Private sector: Time Machine pushes the limits of science and technology, helping companies by delivering new techniques for smart information extraction and services for big historical data

analytics. Collaborating with this project gives companies greater exposure as well as the reward of being part of a long-term, cutting-edge technology revolution.

General Public: Time Machine creates an accessible and exciting channel for sharing, exploring and understanding information about Europe's past. This project informs citizens of their own history via a publicly useable form of advanced technology. What did your street look like in the eighteenth century? Where did your ancestors live? Answering these engaging questions is now finally on the horizon. Time Machine promotes the preservation and understanding of heritage to help future-proof Europe for later generations.

Time Machine in the News

Unleashing Big Data of the Past — Europe Builds a Time Machine

10 March 2019

The European Commission has chosen Time Machine as one of the six proposals retained for preparing large scale research initiatives to be strategically developed in the next decade. €1 million in funding has been granted for preparing the detailed roadmaps of this initiative that aims at extracting and utilising the Big Data of the past. Time Machine foresees to design and implement advanced new digitisation and Artificial Intelligence (AI) technologies to mine Europe's vast cultural heritage, providing fair and free access to information that will support future scientific and technological developments in Europe.

The Time Machine will create advanced AI technologies to make sense of vast amounts of information from complex historical data sets. This will enable the transformation of fragmented data – with content ranging from medieval manuscripts and historical objects to smartphone and satellite images – into useable knowledge for industry. In essence, a large-scale computing and digitisation infrastructure will map Europe's entire social, cultural and geographical evolution. Considering the unprecedented scale and complexity of the data, The Time Machine's AI even has the potential to create a strong competitive advantage for Europe in the global AI race.

"Time Machine is likely to become one of the most advanced Artificial Intelligence systems ever built, trained on data from wider geographical and temporal horizons", explains Frederic Kaplan, Professor of Digital Humanities at the Ecole Polytechnique Fédérale de Lausanne (EPFL) and Coordinator of the Time Machine Project.

Cultural Heritage is one of our most precious assets, and the Time Machine's ten-year research and innovation program will strive to show that rather than being a cost, cultural heritage investment will actually be an important economic driver across industries. This constant source of new knowledge will be an economic motor, giving rise to new professions, services and products in areas such as education, creative industries, policy making, smart tourism, smart cities and environmental modelling. For example, services for comparing territorial configurations across space and time will become an essential tool in developing modern land use policy or city planning. Likewise, the tourism industry will be transformed by professionals capable of creating and managing newly possible experiences at the intersection of the digital and physical world. These industries will have a pan-European platform for knowledge exchange which will add a new dimension to their strategic planning and innovation capabilities.

Time Machine will mark a new age for Social Sciences and Humanities, as it will offer open access to Europe's past via unified data and new AI services. This will give "super powers" to researchers by revolutionising the individual researcher's search capabilities, drastically raising the overall scale and

scope of social sciences and humanities research. The resulting knowledge will enable the field to effectively contribute to the development of strategic answers to major pan-European challenges such as sustainable growth, social welfare, migration and integration of migrants, and the safeguarding of European democracy.

Education is a crucial factor for the social and economic well-being in Europe and the world, and Time Machine will help transform it by creating a dynamic new industry for the production of educative digital material based on aligned massive datasets. The resulting online courses, materials, simulations and other experiences will promote active engagement with our combined cultural heritage and make continuous learning more accessible and inclusive.

Time Machine promotes a unique alliance of leading European academic and research organisations, Cultural Heritage institutions and private enterprises that are fully aware of the huge potential of digitisation and the very promising new paths for science, technology and innovation that can be opened through the information system that will be developed, based on the Big Data of the Past. In addition to the 33 core institutions that will be funded by the European Commission, more than 200 organisations from 33 countries are participating to the initiatives, including seven national libraries (Austria, Belgium, France, Israel, Netherlands, Spain, Switzerland), 19 state archives (Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Lithuania, Malta, Norway, Poland, Romania, Slovenia, Spain, Slovakia, Sweden, and Switzerland), famous museums (Louvre, Rijkmuseum), 95 academic and research institutions, 30 European companies and 18 governmental bodies.

Time Machine is also a growing network of cities. The project is based on a “franchise” operation model grouping scholars, cultural heritage organisations, government bodies and large groups of volunteers around specific integrated projects focusing on cities. The engagement of a large number of volunteers, often local citizens, in these Local Time Machine initiatives is another key element to ensure their long-term sustainability of the project. Local Time Machines are currently being developed in Venice, Amsterdam, Paris, Jerusalem, Budapest, Regensburg, Nuremberg, Dresden, Antwerp, Ghent, Bruges, Naples, Utrecht, Limburg and more. In the next 12 months, Time Machine is expected to grow as a large community of communities, sharing a standardised platform, with more empowering tools.

Background

In early 2016, the European Commission held a [public consultation](#) of the research community to gather ideas on science and technology challenges that could be addressed through future Large-Scale Research Initiatives. End of 2016, Commissioner Oettinger hosted a [round-table](#) event with high-level representatives from the Member States, industry and academia. They agreed on three major areas where promising grand science and technology challenges could be addressed by the Large-Scale Research Initiatives: "ICT and connected society", "Health and the life sciences" and "Energy, environment and climate change". As a result, a [call for preparatory actions](#) for future research initiatives was launched in October 2017 as part of the Horizon 2020 Large-Scale Research Initiative Programme 2018. From the 33 proposals submitted, six were selected after a two-stage evaluation by independent high-level experts.

Time Machine project announces key partnerships with Ubisoft, Europeana and Indra Sistemas S.A.

6 November 2018

The Time Machine Large-Scale Research Initiative has announced three significant strategic partnerships with Europeana Foundation, Indra Sistemas S.A. and Ubisoft, for the implementation of Time Machine's Large-Scale Historical Simulator, which will map 5000 years of European history.

The Time Machine project capitalises on Europe's unique cultural history to construct a technological platform that enables the intuitive navigation of Europe's past through a variety of engaging interfaces. The three partnerships are fundamental to the project, providing expertise in digitisation, advanced machine learning and the creation of virtual worlds.

Ubisoft provides 30 years of experience in creating virtual worlds. This includes the well-known videogame series Assassin's Creed®, which was developed with contributions from historical and architectural experts. Ubisoft's expertise in creating immersive digital content could help to transform data obtained from the Time Machine project into a format that is accessible to the general public.

Europeana Foundation is the operator of Europeana, the digital platform for European cultural heritage that currently provides open access to over 50 million digitised objects, ranging from newspapers to musical instruments and ancient maps. Europeana Foundation will support Time Machine by expanding its catalogue of cultural artefacts across Europe. This partnership has been announced within the European Year of Cultural Heritage, highlighting the importance of Time Machine within the EU's overall digital transformation strategy, particularly as a tool for widening cultural participation.

Indra is a Spanish information technology company, world leader in the development of comprehensive technological solutions in fields such as Defense & Security, Transport & Traffic, Energy & Industry, Telecommunications & Media, Financial Services and Public Administrations & Healthcare. Through its Minsait unit, it provides a response to the challenges of digital transformation. As a leading partner, Indra will help contribute the technological solutions behind Time Machine's big data, multi-level information system. The project will rely on machine learning and artificial intelligence technologies to create new layers of information, expressing the data through novel formats.

These key partnerships signify strong support for Time Machine's large scale, visionary platform that will create an unparalleled free-to-use educational resource. The technological solutions produced as the project develops will also encourage innovation in other sectors, placing Europe as a world leader in the application of artificial intelligence.

Deborah Papiernik, SVP of New Business Development at Ubisoft, said: "The Time Machine project is a brilliant opportunity for us to employ our expertise in creating credible and immersive virtual worlds to transform the wealth of European cultural data into an engaging format for the general public."

Harry Verwayen, Executive Director of Europeana Foundation, said: "The Time Machine project is uniquely positioned to support us in our aim to ensure cultural heritage plays a pivotal role in the digital transformation of Europe. It is crucial that the next wave of technological innovations such as machine learning and AI are applied in ways that allow people to engage with their heritage based on trust and inclusion."

Jesús Angel García, Head of R&D at Indra, said: "The technological solutions formed through the Time Machine project will not only benefit the digital heritage sector, but will also lead to future initiatives across sectors."

European Time Machine conference to unveil exciting breakthroughs in technology and data science

30 October 2018

The Time Machine Large-Scale Research Initiative kicks off its inaugural conference, Time Machine 2018, today in Lausanne at the SwissTech Convention Center on the campus of the École Polytechnique Fédérale de Lausanne (EPFL). Billed as the most ambitious cultural heritage event of the year, the conference is set to attract representatives from more than 200 European institutions — ranging from major European museums to leading companies in the digitisation and artificial intelligence fields.

Time Machine aims to process millions of historical documents, paintings, landscapes and monuments to become the largest historical computer simulation ever developed, transforming how universities, policymakers, urban planners and the wider global community experience European history and culture. This is the first time that an endeavour of this type, at the intersection of information technology and the humanities, is attempting such a long-term project.

To mark this exciting occasion, the first prototype of the Time Machine open source search engine, developed collectively by different partners of the consortium on the data of the Venice Time Machine, will be released under the code name “Diamond”. It includes search functionalities based on machine transcription of ancient handwriting, iconographic searches based on deep learning technology and a spatiotemporal interface for exploring a city’s structure at different stages.

Among the important announcements at Time Machine 2018, Bill Peck, Chief Technology Officer of Twist Bioscience corporation, will report on the first experiment on storing part of the Time Machine’s data on DNA - a promising solution for long-term data storage. A sample of EPFL’s high-resolution scanning of the Basilica San Marco has been encoded, then written in DNA and subsequently decoded by a team comprised of Twist Bioscience, Microsoft and researchers from University of Washington. The process restored the data with 100% accuracy. The rapid development of this new storage technology opens a potentially sustainable and scalable avenue for long-term storage of the Time Machine data.

Technology will also be demonstrated in the Time Machine Forum, where companies and institutions will showcase the latest technologies for digitising, storing and experiencing the future of cultural heritage. Among them, Ubisoft, another consortium founding member, will demonstrate the latest immersive technology permitting individuals to navigate virtual worlds of the past via a high-resolution model of cultural heritage sites and IGN, French national mapping agency, will showcase document analysis technology to extract and align historical data on cities and landscapes.

Among the 33 founding institutions financially sustaining the project in its early stage, Europeana Foundation, the operator of the European platform that currently provides open access to over 50 million digitised objects, will bring its 10-year expertise for bridging the gap between cultural heritage and the digital world.

Frédéric Kaplan, Professor in Digital Humanities at EPFL and Director of the Venice Time Machine explains: “The Diamond prototype can be considered the first in a new generation of search engines which natively integrates the temporal dimension with the indexation and classification of their results. I foresee that this innovation will progressively produce serious competitors for the search engines of the present.”

Deborah Papiernik, Ubisoft’s Senior Vice President for New Business, comments: “The Time Machine project is a brilliant opportunity for us to employ our expertise in creating credible and immersive virtual worlds to transform the wealth of European cultural data into an engaging format for the general public.”

Harry Verwayen, Executive Director of Europeana Foundation: “Digitized cultural heritage has tremendous potential for the regeneration of Europe. The culture and creative industries contribute over 12 million jobs in Europe and its economic impact extends from cultural tourism to areas such as health and well-being. Artificial Intelligence has the potential to unlock that potential in unprecedented ways. It can help us to mass digitize and automate metadata extraction. But more importantly it can help us to interrogate how we look at our past. This is a key infrastructural skill that Europe should invest in and why Europeana Foundation is proud to be part of the Time Machine project.”

Bénédicte Bucher, Senior Scientist in geographical information sciences at Université Paris Est and IGN, the French national mapping agency: “Moving in Space and time, across different scales and perspectives, will give societies accurate dashboards needed at the level of united nations, european commission or more local administration to elaborate relevant and achievable commitments regarding land use. European place histories and Time Machine browsing paradigms will become a knowledge book that adapts to any context.”

Time Machine project takes next step to simulating Europe’s history

4 June 2018

The Time Machine Large-Scale Research Initiative is an international collaborative project to build a Large Scale Historical Simulator mapping 5000 years of European history.

It has brought together academic research teams, public organisations and digital companies from all over Europe, and comprises of over 170 institutions, ranging from the major European museums to leading companies in the field of digitisation and artificial intelligence.

To help support these partners, the Time Machine project has announced that it has passed the Horizon 2020 Framework Programme’s first stage of evaluation for bids for the 1 billion Euros of funding available for new Flagships.

The decision, approved by the European Commission, allows the project to submit a full proposal for the second stage of evaluation later this year.

A total of 33 projects from across Europe applied for the Horizon 2020 Flagship funding, which is intended for visionary, science-driven, large-scale research initiatives. Only the Time Machine project and 16 others were selected for the second round - a vital validation of Time Machine’s scope and efforts.

These efforts include the digitisation of millions of historical documents, paintings and monuments, and the digital transfer of these data into the largest historical computer simulation ever developed.

First proposed to the European Commission in April 2016, the project has since primarily focused on the historical recreation of Venice, but work is already in progress to digitise and simulate other European regions including Amsterdam, Paris, Antwerp and Budapest.

As a free-to-use public resource, Time Machine will act as a highly interactive and detailed historical educational tool, with invaluable uses for schools, universities, policy makers and urban planners.

As an additional benefit, the unique computer simulation technology that is being developed for the project will firmly place Europe as a world leader in the race to innovate artificial intelligence.

On surpassing the Framework’s first stage of evaluation, Professor Frédéric Kaplan, Director of the École polytechnique fédérale de Lausanne Digital Humanities laboratory said: “This is a first step towards a crucial goal, not just for European cultural heritage, but for the world’s cultural heritage.”

Julia Noordegraaf, Professor of Digital Heritage at the University of Amsterdam, said: “We’re delighted with the announcement.”

“It’s a wonderful recognition of the project’s potential and it means that we can now further develop our plan of action to make the Time Machine possible.”

Time Machine in the Media

Film and Radio

RTS Radio Télévision Suisse

The guest of La Matinale - Frédéric Kaplan, professor of digital humanities at EPFL
5 March 2019

<https://www.rts.ch/play/tv/la-matinale/video/linvite-de-la-matinale-video-frederic-kaplan-professeur-en-humanites-digitales-a-lepfl?id=10265643&expandDescription=true>

Frédéric Kaplan discusses the Time Machine Project on Radio Télévision Suisse.

Backdoor Broadcasting Company

The Venice Time Machine Project: Digitising Heritage in Time and Space
24 January 2019

<https://backdoorbroadcasting.net/2019/01/the-venice-time-machine-project-digitising-heritage-in-time-and-space/>

Frédéric Kaplan and Isabella di Lenardo present The Venice Time Machine Project: Digitising Heritage in Time and Space at the Warburg Institute, London.

RTS Radio Télévision Suisse

Venice time machine or how to rearrange the past
12 November 2018

<https://www.rts.ch/play/radio/versus-penser/audio/venise-time-machine-ou-comment-reorganiser-le-passe?id=9952378&station=a83f29dee7a5d0d3f9fccdb9c92161b1afb512db>

Extensive project initiated by EPFL in 2012, “The Venice Time Machine,” is a machine to go back in time, a unique search tool, which allows for the compilation of archives to obtain an exact reproduction of the city through space and time. The project now brings together dozens of European cities. It aims to jackpot financing one billion euros. What are the stakes of the digitisation of the past? Why is it so urgent today to access this archival continent?



ABC Radio Show

Europe's Time Machine
23 September 2018

<http://www.abc.net.au/radionational/programs/futuretense/europe's-time-machine-solar-geo-engineering-and-how-to-build/10256890>

A massive data project is underway in Europe. It aims to create a kind of “Google map of the past” – making the minutia of history as accessible as today's social media. Anthony Funnel of ABC's Future Tense podcast interviews Frédéric Kaplan about his work and visions for Time Machine.

Radio Télévision Suisse

Remonter le temps à Venise
22 October 2017

<https://www.rts.ch/play/tv/mise-au-point/video/remonter-le-temps-a-venise?id=9020497&station=a9e7621504c6959e35c3ecbe7f6bed0446cdf8da>

EPFL researchers are working on a Time Machine: a unique search tool, which digitally compiles and analyses archives to obtain an exact reproduction of Venice through the ages. Take a walk through the past.

Nature Video Productions

A virtual time machine for Venice
14 June 2017

<https://www.nature.com/nature/videoarchive/time-machine/index.html>

The State Archives of Venice contain records stretching back over a thousand years. The vast collection of maps, images and other documents provide an incredibly detailed look into Venetian history. This could be used to create a kind of virtual time machine for historians and the public to explore the city.

ARTE

Venice Time Machine – History and Big Data
2017

<https://www.arte.tv/en/videos/RC-015617/venice-time-machine-history-and-big-data/>

Where history meets the latest technology, the Venice Time Machine is an ambitious project to digitise 10 centuries of the Venetian state's archives. Academics from Switzerland and Italy are collaborating to create a digital resource that will bring the Venice of the past to life.



TED Talk

How to Build an Information Time Machine
June 2013

https://www.ted.com/talks/frederic_kaplan_how_i_built_an_information_time_machine?language=en

Imagine if you could surf Facebook... from the Middle Ages. Well, it may not be as far off as it sounds. In an exciting and interesting talk, Frédéric Kaplan shows off the Venice Time Machine, a project to digitise 80 kilometres of books to create a historical and geographical simulation of Venice across 1,000 years.

Rai Education

Digital World: Venice Time Machine – Archivio di Stato digitale

<https://www.raisplay.it/video/2018/05/253-12-DW3-Venice-time-machine-archivio-cd19fdd1-e6d2-44f6-9522-c718421660fc.html>

The Venice Time Machine is a great scientific project with the aim of creating a multimedia model of Venice and creating links that are not viable with traditional instruments. Using deep learning and artificial intelligence, the Venice Time Machine aims to extract data, restructure it and relate it to other data so that future researchers can easily find it. The digitisation of ancient documents is extremely delicate because the materials can be fragile. X-rays allow you to read these documents without opening them, using a three-dimensional image.

Articles

WIRED

Scientists reveal ancient social networks using AI – and x-rays
21 March 2019

<https://www.wired.com/story/scientists-reveal-ancient-social-networks-using-ai-and-x-rays/>

Wiener Zeitung

EU funding as a turbo for genealogy
4 March 2019

https://www.wienerzeitung.at/nachrichten/kultur/medien/1020180-EU-Foerderung-als-Turbo-fuer-Ahnenforschung.html?fbclid=IwAR3P2TG0pfGRy6lYFEioMtuW0jEfXnbP1SFIRKftyE5jyLM_VXRLy_Y_YD2k

Scientific American

Europe's next big-budget science projects: 6 teams proceed to final round
12 February 2019

<https://www.scientificamerican.com/article/europes-next-big-budget-science-projects-6-teams-proceed-to-final-round/>



Mark Tech Post

Will machine learning enable time travel?
30 January 2019

<https://www.marktechpost.com/2019/01/30/will-machine-learning-enable-time-travel/>

Spiegel

So sah es wirklich im alten Venedig aus
11 January 2019

<https://www.spiegel.de/plus/venedig-so-sah-es-wirklich-im-alten-venedig-aus-a-00000000-0002-0001-0000-000161789362>

APA Science

Projekt "Time Machine" – "Zeitmaschine" für den Stephansdom
3 January 2019

https://science.apa.at/rubrik/kultur_und_gesellschaft/Projekt_Time_Machine_-_Zeitmaschine_fuer_den_Stephansdom/SCI_20190301_SCI39351351647186742

Apollo

Is it too late to save Venice?
2 January 2019

<https://www.apollo-magazine.com/is-it-too-late-to-save-venice/>

Le Temps

La machine vénitienne à remonter le temps se tourne vers l'Europe
21 February 2018

<https://www.letemps.ch/sciences/machine-venitienne-remonter-temps-se-tourne-vers-leurope>

My Science

Time Machine in the running to become a FET Flagship
16 February 2018

https://www.myscience.org/news/wire/time_machine_in_the_running_to_become_a_fet_flagship-2018-epfl



Le Monde

Venice Time Machine, à remonter le temps
13 December 2017

https://www.lemonde.fr/tant-de-temps/article/2017/12/13/venice-time-machine-un-canal-a-remonter-le-temps_5229068_4598196.html

Nature

The 'time machine' reconstructing ancient Venice's social networks
14 June 2017

<https://www.nature.com/news/the-time-machine-reconstructing-ancient-venice-s-social-networks-1.22147>

Corriere della Serra

Un Facebook del passato per Venesia: con «Venice Time Machine» la città del '500 è ricostruita in 3D
27 November 2015

https://www.corriere.it/italia-digitale/cards/facebook-passato-venezia-venice-time-machine-citta-500-ricostruita-3d/storia-portata-mano_principale.shtml?refresh_ce-cp

WIRED

Venetian time lord makes 1,000 years of history searchable
28 July 2014

<https://www.wired.co.uk/article/venetian-timelord>