**UNEMA Automata Project**

**RESOURCES PAGE**

To help develop your project idea, start by considering relevant resources from the following entertaining, idiosyncractic, and by-no-means thorough list:

**Books**

Bacon, M., *No Strings Attached*, Virgin, 1997.

Bailly, C., & Bailly, S., *Automata: the golden age 1848-1914*, Sotherby’s Publications/Philip Wilson Publishers Ltd, 1987.

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Hansen, W., *Handbook of Classical Mythology*, ABC-Clio, 2004.

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Mayor, A., *Gods and Robots: myths, machines, and ancient dreams of technology*, Princeton University Press, 2018.

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Simons, G.L., *Robots: the quest for living machines*, Cassell, 1992.

Spilhaus, A. & K., *Mechanical Toys: how old toys work*, Robert Hale Press, 1998.

Truitt, E.R., *Medieval Robots: mechanism magic, nature, and art*, University of Pennsylvania Press, 2015.

Williams, A., *History of Digital Games*, Taylor & Francis, 2017.

Woodford, S., *Images of Myths in Classical Antiquity*, Cambridge University Press, 2003.

Zielinski, S. & Weibel, P., eds., *Allah’s Automata: artifacts of the Arab-Islamic Renaissance (800-1200)*, ZKM, 2015.

**Chapters**

Berryman, S., “The imitation of life in Ancient Greek Philosophy,” in Riskin, J., ed., *Genesis Redux: essays in the history and philosophy of artificial life*, Chicago University Press, 2007, 35-45.

Bryson, J., & Kime, P., “Just an Artifact: why machines are perceived as moral agents,” in Walsh, T., ed., *Proceedings of the Twenty-Second International Joint Conference on Artificial Intelligence*, Vol.2, AAAI Press, 2011, 1641-1646.

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Marshall, C.W., “Do Androids Dream of Electric Greeks?” *Eidolon*, October 26 (2017), <https://eidolon.pub/do-androids-dream-of-electric-greeks-a407b583a364>.

Martinho-Truswell, A., “To Automate in Human,” *Aeon*, February 13, 2018, <https://aeon.co/essays/the-offloading-ape-the-human-is-the-beast-that-automates>.

**Web Resources**

Ambrosino, B., “When Robots are Indistinguishable from Humans What Will Be Inside Them?” *Popular Mechanics* (February 15, 2017), [www.popularmechanics.com/culture/tv/a25210/inside-synths-amc-humans/](http://www.popularmechanics.com/culture/tv/a25210/inside-synths-amc-humans/)

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Art of Play: <https://www.artofplay.com/blogs/articles/automatons-the-odd-magic-of-living-machines>

Automata and Mechanical Toys: <https://www.mechanical-toys.com/>

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Cabaret Mechanical Theatre: [www.cabaret.co.uk](http://www.cabaret.co.uk)

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Keith Newstead’s Links Page: <https://www.keithnewsteadautomata.com/links/>

Kristec, L., “Notes from the Curator’s Office: of automatons and automata,” *The Museum of Unnatural Mystery*, 06/2011: <http://www.unmuseum.org/notescurator/automata.htm>

Reuben Hoggett, “1891-1893: Steam Man - Prof. George Moore (Canadian/American),” *Cyberneticzoo.com: a history of cybernetic animals and early robots*, 6 October 2009, <http://cyberneticzoo.com/steammen/1891-1893-steam-man-prof-george-moore-canadianamerican/>

RAC Car and Motoring: <https://rac.com.au/car-motoring/info/future_history-of-automation>

Rochat: <http://freres-rochat.com/wp-content/uploads/2015/07/Fr%C3%A8res-Rochat-Corporate-Brochure-panorama.pdf>

Ruffell, I., “Hero’s Automata: first moves,” University of Glasgow Classics Research Blog on ancient technology, <http://classics.academicblogs.co.uk/heros-automata-first-moves/>

**Museums**

Kotsanas Museum of Ancient Greek Technology (Greece): <https://kotsanas.com/gb/index.php>

Mechanical Art and Design Museum (UK): <https://themadmuseum.co.uk/history-of-automata/>

Modern Automata Museum, Rieti (Italy): <http://www.modernautomatamuseum.com/>

Morris Museum, Guinness Collection, NJ (US): <https://morrismuseum.org/on-view/permanent-galleries/murtogh-d-guinness-collection-mechanical-music-automata>

Muzey Sobraniye, Museum Collection of David Yakobashvili (Russia): <https://mus-col.com/>

Musée De L’Automate, Souillac (France): <https://www.musee-automate.fr/>

Musée Des L’Automates & Modèles Réduits (France): <https://museeslarochelle.com/>

Museo de Autómatas del Tibidabo (Spain): <https://www.tibidabo.cat/ca/en-el-parc/atraccions/museu-dautomats>

Museum of Music Automatons Seewen SO (Switzerland): <https://www.musikautomaten.ch/mma/de/home.html>

Nosaka Automata Museum (Japan): <http://www.automata.co.jp/>

Novelty Automation (UK): <https://novelty-automation.com/>

Neuchâtel Art & History Museum, Jaquet-Droz Automata Room, (Switzerland): <https://www.mahn.ch/fr/expositions/automates-jaquet-droz>

**Assistive, Bionic, and Prosthetic Technology**

Free 3D Hands: <https://free3dhands.org/>

Free 3D Hands Media, esp. “Advancing Australia: Access for All Documentary, Ch.10” <https://free3dhands.org/media/>

eNable: <https://enablingthefuture.org/>

“How 3D-Printed Prosthetic Hands Are Changing These Kids’ Lives: short film showcase” National Geographic, <https://www.youtube.com/watch?v=Cl8ijPGEKO8&t=208s>

van Nostrand, A., “Ancient Bionics: the origins of modern prosthetics,” Dig Ventures, March 10 (2015), <https://digventures.com/2015/03/ancient-bionics-the-origins-of-modern-prosthetics/>

Ramsay, G.J., “Mechanical Speech Synthesis in Early Talking Automata,” <https://acousticstoday.org/wp-content/uploads/2019/06/Mechanical-Speech-Synthesis-in-Early-Talking-Automata-Gordon-J.-Ramsay.pdf>

Voon, C., “The Sophisticated Design of a 3,000-Year-Old Wooden Toe,” *Hyperallergic*, 2017, <https://hyperallergic.com/387047/the-sophisticated-design-of-a-3000-year-old-wooden-toe/>

**UNEMA Automata Alley Exhibition**

<https://www.une.edu.au/info-for/visitors/museums/museum-of-antiquities>

**Biographical Index**

Amenhotep, son of Hapu, of Thebes, Egypt (15th century BC), melodious statue of Memnon.

Archytus of Tarentum (420-411 BC), pneumatic-pulley-system driven wooden pigeon.

Archimedes of Syracuse, Sicily (287-212 BC), described the worm gear, levers, hydrostatics and the calculation of pi (π)

Hero of Alexandria (285-222 BC), hydraulic, pneumatic, and mechanical power, mechanical theatres.

Ctesibius of Alexandria (c.285-222 BC), mechanical inventions.

Philo of Byzantium (c.250-180 BC), automata and scientific and mechanical theory.

Abdullah al-Ma’mūn, Caliph of Baghdad (c.AD 800), commissioned *Kitab al-Hiyal* (“The Book of Ingenious Devices”)

Albertus Magnus of Cologne (c. AD 1200-1280), automaton “android” smashed by Thomas Aquinas.

Al-Jazarī of Persia (AD 1206), clepsydra, automata, treatise on automata.

European Clockmakers (c.14th century AD) Jacquemarts in churches and clock towers

Johannes Muller “Regiomontanus” of Unfinden Königsberg, Bavaria (AD 1436-1476), wooden eagle and iron fly automata.

Leonardo da Vinci of Anchiano, Italy (AD 1452-1519), animal, insect, and military automata, and numerous scientific innovations.

Giannello Torriano of Cremona, Milan (c.AD 1500-1585), automata maker to Charles V, famous for “The Monk” automaton.

Hans Bullmann of Nuremberg (d. AD 1535), Nuremberg clockwork automata.

Isaac Habrecht of Schaffhausen (AD 1544-1620), 1574 Strasbourg clock, and clock automata.

Hans Schlottheim of Ausberg (AD 1547-1625), Ausburg clocks and automata.

Josias Habrecht, brother of Isaac, of Schaffhausen (AD 1552-1635), 1574 Strasbourg clock, and clock automata.

Thomas Francine (Tommaso Francini) of Florence (AD 1571-1651), Saint Germain en Laye/Versailles gardens and grottos automata.

Cornelius Drebbel of Holland (AD 1573-1633),

Robertus de Fluctibus of England (AD 1574-1637), hydraulics and automata.

Salmon de Caus of France (AD 1576-1626), steam engine and hydraulic inventions, automata for grottos.

Christian Theodor Danbeck & Abraham Augsburg (17th century AD), mechanical pictures with clockwork movement.

Anathasius Kircher of Würzburg (AD 1601-1680), founder of Cabinet of Physics in Rome.

Georg Philipp Harsdörffer of Nuremberg (AD 1607-1658), a word generator and series of Nuremberg tradesmen automata.

Kaspar Schott of Würzburg (AD 1608-1666), automata playing musical instruments and author of *Mecanica* 1657.

Jacob Lovelace of England (AD 1656-1716), astronomical clocks with automata and music.

Le Pere Sebastien Truchet of Lyons (AD 1657-1729), mechanical theatre and *tableaux mouvants*.

Henry Bridges of England (AD 1697-1754), clockmaker and Microcosm astronomique automata.

Jacques de Vaucanson of Grenoble (AD 1709-1782), the defecating duck, automata and mechancial inventions.

Pierre Rochat of Vallee des Joux, Switzerland (AD 1718-1806), worked for Jaquet-Droz. His family went on to found a dynasty of luxury automata, watch, and singing bird makers. David III Rochat, son of Pierre (AD1746-1812); Henri Samuel (AD1777-1854), David Frederich Henri (1774-1848), and Jacques Francois Elisee Rochat (1771-1836), grandsons of Pierre; Antoine Auguste Frederic (1799-1882), Charles Louis Francoise (1759-1862), and Ami-Napoleon Francoise Rochat (1807-1875), great-grandsons of Pierre.

Ludwig Knauss of the House of Hesse, Germany (AD 1715-1750), court clockmaker.

Pierre Jaquet-Droz of Chaux de Fonds, Switzerland (AD 1721-1790), watches and clocks with miniature automata, and androids.

James Cox of London (AD 1723-1800), celebrated clockmaker, jeweller and automata maker.

Friedrich von Knauss of the House of Hesse, Germany (AD 1724-1789), court mechanic and writing automata.

L’Abbé Mical of France (AD 1730-1789), talking heads and the android flautist.

Jean Mathieu de Ventavon, Jesuit (AD 1733-1787), automata for the Qianlong emperor of China.

Wolfgang von Kempelen of Vienna (AD 1734-1804), talking machines and “trick” chess-player.

Charles le Pere of Paris (AD 1738-1804), automata for Emperor Kien Lang of China 1790.

Yorinao Hosokawa of Japan (AD 1741-1796), 3 volume manual “*Sketches of Automata*.”

Jean Henri Nicholas Maillardet of Meyries, Switzerland (AD 1745-1830), having worked for Jaquet-Droz and Leschot, he produced androids that were exhibited in London, small jewelled automata, and the now famous ‘Draughtsman-Writer’.

Pierre Kintzing of Germany (AD 1746-1816), mechanic associated with David Roentgen; tympanon at Conservatoire des Artes et Metiers.

Jean Frederic Leschot of Chaux de Fonds, Switzerland (AD 1746-1827), clocks, watches, automata and singing birds.

Jean David Maillardet, brother of Jean Henri, of Fontaines (Neuchâtel), Switzerland (AD 1748-1834), created automata for magicians and worked with the Robert family.

Henri Louis Jaquet-Droz, son of Pierre, of Chaux de Fonds, Switzerland (AD 1752-1791), worked with father, Leschot, and Maillardet.

Johann Gottfried Kaufmann of Frankfurt (AD 1752-1818), “The Trumpet Player” (1810) and other musical automata.

Joseph Marie Jacquard of Lyon, France (AD 1752-1834), invents punch card programming for automated weaving looms in 1805.

Jacob Frisard of Villeret, Switzerland (AD 1753-1812), automata watches, singing bird boxes, and snuff boxes for European, Turkish and Oriental markets.

Johann Nepomuk Mälzel of Regensburg (AD 1772-1838), Panharmonicon musical orchestre, patented a talking doll, and the invention of the metronome.

Philippe Samuel Meylan of Brassus (AD 1772-1845), worked in Geneva making automata for watches and snuff boxes.

Isaac Daniel Piguet of Vallee des Joux, Switzerland (AD 1775-1841), associate in Geneva of Ph.S. Meylan, specialising in complicated musical watches.

Julien Auguste Maillardet, son of Jean David (AD 1779-1852), worked on automata with his father at Neuchatel.

Leonard Rupert Mälzel of Regensburg (AD 1783-1855), also a distinguished automata maker, but erroneously credited with some of his brother Johann’s inventions.

Charles Brugier of Geneva (AD 1788-1862), founder of Brugier, makers of automata and singing birds.

Jean Eugene Blois Robert-Houdin of France (AD 1805-1871), inventor, illusionist, and escape artist who used automata in his shows.

Johann Bartholomew Rechsteiner of Switzerland (AD 1810-1893), mechanic and automata repairer for Museum of Automata of Dietz and Frechon; also repaired Vaucanson’s duck.

H. Stenevard of Paris (mid 19th century AD), mechanic and showman specialising in musical automata and automata for magicians.

Blaise Bontems of Paris (mid 19th century AD), inventions for clocks and automata, and specialising in singing birds. His business was continued by his sons Charles & Alfred, and grandson Lucien.

Jean Roullet of Paris (c.AD 1830s-1907), founded the automata-making firm of Roullet-Decamps.

Carl Faberge of St Petersburg (AD 1846-1920), jeweller and trinket maker specialising in *chefs d’oevre* and Easter eggs to the Tsar of Russia.

Henri Ernest Decamps of Paris (AD 1847-1909), son-in-law of Jean Roullet.

Emmanuel Cottier of Carouge, Switzerland (AD 1858-1930), mechanic, watchmaker, automata and mechanical theatre for shadow shows.

H. & G. Vichy of Paris (AD 1860), established firm producing realistic musical, smoking, and performing automata. The firm was succeeded by Maison Triboulet.

Gaston Decamps, son of Henri, of Paris (AD 1882-1972), automata and robots for window displays and exhibitions. His business was continued by his daughter Celeste and her husband Georges Bellancourt.

George Moore of Canada (c. AD 1893), walking steam-man automaton.

Sainte-Croix Reuge of Switzerland (20th century AD), musical boxes, singing birds, and modern automata.

Alan Turing of London (AD 1912-1954), cryptanalyst and logician describes the “Turing Test” in 1950.

George Devol of Connecticut (AD 1912-2011), “grandfather of robotics” creates the first programmable robotic arm.

Isaac Asimov of Boston, (AD 1920-1992), short story “Runaround” (1942) describes the three laws of robotics.

Jack Kilby of Texas, US (AD 1923-2005) and Robert Noyce of Texas, US (AD 1927-1990), each independently invent the computer chip in 1958-1959.