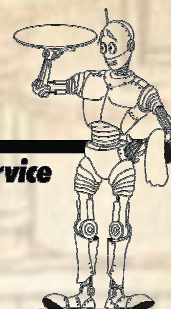# RobotShop INC.

La robotique à votre service

History of Robotics: Timeline

This history of robotics is intertwined with the histories of technology, science and the basic principle of progress. Technology used in computing, electricity, even pneumatics and hydraulics can all be considered a part of the history of robotics. The timeline presented is therefore far from complete.

Robotics currently represents one of mankind's greatest accomplishments and is the single greatest attempt of mankind to produce an artificial, sentient being. It is only in recent years that manufacturers are making robotics increasingly available and attainable to the general public.

The focus of this timeline is to provide the reader with a general overview of robotics (with a focus more on mobile robots) and to give an appreciation for the inventors and innovators in this field who have helped robotics to become what it is today.

Greek Times

Some historians affirm that Talos, a giant creature written about in ancient greek literature, was a creature (either a man or a bull) made of bronze, given by Zeus to Europa. [6] According to one version of the myths he was created in Sardinia by Hephaestus on Zeus' command, who gave him to the Cretan king Minos. In another version Talos came to Crete with Zeus to watch over his love Europa, and Minos received him as a gift from her. There are suppositions that his name Talos in the old Cretan language meant the "Sun" and that Zeus was known in Crete by the similar name of Zeus Tallaios. Since Talos was a bronze man, his blood was lead, which they believed was a divine fluid (ichor), identical to that what runs in the veins of the gods. Talos' single vein was leading from his neck through his body to one of his heels, which was closed by a bronze nail or a bronze peg or a pin. [13]

~77-100BC

In 1901, between the islands of Crete and Kythera, a diver found the remnants of what might only be considered a mechanical computer. The device is a complex mix of gears which most likely calculated the position of the sun, moon or other celestial bodies.[7] The device dates back 2000 years and is considered to be of Greek origin and was given the name "The Antikythera Device".

~270BC

An ancient Greek engineer named Ctesibus made organs and water clocks with movable figures. [2] The concept for his clock was fairly simple; a reservoir with a precise hole in the bottom would take 24 hours to empty its contents. The container was marked into 24 divisions.

278 – 212BC

Archimedes (287-212BC) did not invent robots, but he did invent many mechanical systems that are used in robotics today, as well as advancing the field of mathematics.

10-70AD

The Hero of Alexandria, a Mathematician, Physicist and Engineer (10-70AD) wrote a book titled Automata (Arabic translation, or in Greek "moving itself") which is a collection of different devices which could have been used in temples. The Hero of Alexandria designed an odometer to be mounted on a cart and measure distances traveled. Among his other inventions are a wind-powered organ, animated statues and the Aeolipile. Although conceived simply as a trinket, the Aeolipile can be considered the forefather of modern steam engines. [8]

Medieval times

Automatons, human-like figures run by hidden mechanisms, were used to impress peasant worshippers in church into believing in a higher power. [These mechanisms] created the illusion of self-motion (moving without assistance). The clock jack was a mechanical figure that could strike time on a bell with its axe. This technology was virtually unheard of in the 13th century. [1]

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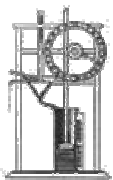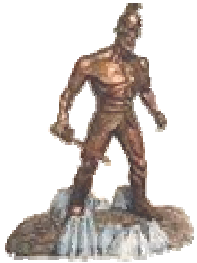
1495

Leonardo da Vinci designed what may be the first humanoid robot though it cannot be confirmed if the design was actually ever produced. The robot was designed to sit up, wave its arms, and move its head via a flexible neck while opening and closing its jaw. [4]

1645

Blaise Pascal invented a calculating machine to help his father with taxes. The device was called the Pascaline [9] and about 50 Pascalines were built. Only a few can be found in museums such as the one on display in the Des Arts et Metiers Museum in Paris.

1666

A pocket version of the Pascaline was invented by Samuel Morland [9] which worked "without charging the memory, disturbing the mind, or exposing the operations to any uncertainty" [14]

18th Century

In the 18th century, miniature automatons became popular as toys for the very rich. They were made to look and move like humans or small animals.[1]

1709

Jacques de Vaucanson's most famous creation was undoubtedly "The Duck." This mechanical device could flap its wings, eat, and digest grain. Each wing contained over four hundred moving parts and even today it remains something of a mystery. The original Duck has disappeared. [10]

1801

Joseph-Marie Jacquard invented a machine (essentially a loom) that could be programmed to create designs that could be printed onto cloth or tissue.

1865

John Brainerd created the Steam Man apparently used to pull wheeled carts and more. [4] In 1885, Frank Reade Jr. built the "Electric Man" which is more-or-less an electric version of the Steam Man. [4]

1903

The first patents were awarded for the construction of a "printed wire" which came into use after World War 2. The concept was to replace radio tube with something less bulky. [18]

1921

The term "robot" was first used in a play called "R.U.R." or "Rossum's Universal Robots" by the Czech writer Karel Capek. The plot was simple: man creates a robot to replace him and then robot kills man! [2]

1937-1938

Westinghouse creates ELEKTRO a human-like robot that could walk, talk, and smoke [4]. ELEKTRO was first unveiled at the 1939 world's fair.

1941

Science fiction writer Isaac Asimov first used the word "robotics" to describe the technology of robots and predicted the rise of a powerful robot industry. [2]

The term robotics refers to the study and use of robots; it came about in 1941 and was first adopted by Isaac Asimov, a scientist and writer. It was Asimov who also proposed the following "Laws of Robotics" in his short story Runaround in 1942.

1942

Isaac Asimov wrote the "Three Laws of Robotics". A zeroth law was later added (law zero below).

Law One: A robot may not injure a human (or humanity), or, through inaction, allow a human (or humanity) to come to harm.
Law Two: A robot must obey orders given it by human beings, except where such orders would conflict with a higher order law.
Law Three: A robot must protect its own existence as long as such protection does not conflict with a higher order law]

Law Zero: A robot may not injure a human being, or, through inaction, allow a human being to come to harm, unless this would violate a higher order law

1942

The first "programmable" mechanism, a paint-sprayer, was designed by Willard Pollard and Harold Roselund for the DeVilbiss Company. (US Patent No. 2,286,571). [4]

1946

George Devol patented a general purpose playback device for controlling machines using magnetic recordings. [4]

1947

On November 14, 1947, Walter Brattain had an accident while trying to study how electrons acted on the surface of a semiconductor. This accident brought about the creation of the first transistor. [16]

1948

W. Grey Walter created his first robots; Elmer and Elsie, also known as the turtle robots. The robots were capable of finding their charging station when their battery power ran low. [4]

1951

Raymond Goertz designed the first tele-operated articulated arm for the Atomic Energy Commission. This is generally regarded as a major milestone in force feedback (haptic) technology. (US Patent 2679940) [4]
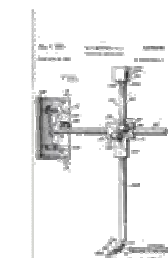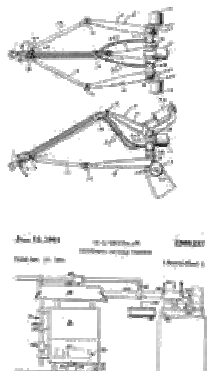
1954

George Devol designed the first truly programmable robot and called it UNIMATE for "Universal Automation." (US patent 2 998 237) [4] Later, in 1956, George Devol and Joseph Engelberger formed the world's first robot company "Unimation" which stands for "universal automation". [2] As a result, Engelberger has been called the 'father of robotics'. [3] Unimation is still in production today, with robots for sale. [3]

1957

History changed on October 4, 1957, when the Soviet Union successfully launched Sputnik I. The world's first autonomous, artificial satellite was 22.8 inches in diameter and weighed only 183.9 pounds. [15]

1960's

One of the first operational, industrial robots in North America appeared in the early 1960's in a candy factory in Kitchener, Ontario. [1]

1964

Artificial intelligence research laboratories are opened at M.I.T., Stanford Research Institute (SRI), Stanford University, and the University of Edinburgh. [20]

1965

Carnegie Mellon establishes the Robotics Institute.

1968

The first computer controlled walking machine was created by Mcgee and Frank at the University of South Carolina. [4]

1968

The first manually controlled walking truck was made by R. Mosher. It could walk up to four miles an hour [4]

1968

SRI built "Shakey"; a mobile robot equipped with a vision system and controlled by a computer the size of a room.

1969

Victor Scheinman created the Stanford Arm, which was the first successful electrically-powered, computer-controlled robot arm.

1969

WAP-1 became the first biped robot and was designed by Ichiro Kato. Air bags connected to the frame were used to stimulate artificial muscles [4] WAP-3 was designed later and could walk on flat surfaces as well as climb up and down stairs or slopes. It could also turn while walking. [4]

1973

V.S. Gurfinkel, A. Shneider, E.V. Gurfinkel and colleagues at the department of motion control at the Russian Academy of Science create the first six-legged walking vehicle. [4]
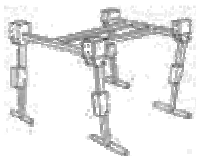
1973

Ichiro Kato created WABOT I which was the first full-scale anthropomorphic robot in the world. It had a system for controlling limbs, vision, and conversation! It was estimated that it had the mental ability of a 18 month old child. [4]
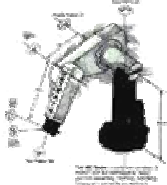
1973

Cincinnati Milacron released the T3, the first commercially available minicomputer-controlled industrial robot (designed by Richard Hohn). [20]
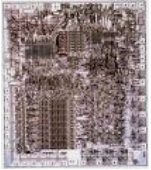
1974

Intel (Integrated Electronics) produced the first batch of second-generation 8080 general purpose chips.

1975

Victor Schenman developed the Programmable Universal Manipulation Arm (Puma). It was widely used in industrial operations. [4]

1975

The MITS ALTAIR was the first 8080 chip based kit computer and is arguably the start of the personal computer. [17]

1977

The Variante Masha, a six-legged walking machine, was created at the Russian academy of Science by Dr. Devjanin, Dr. Grufinkelt, Dr. Lensky, Dr. Schneider, and colleagues. [4]

1978

Shigeo Hirose created ACMVI (Oblix) robot. It had snake-like abilities. The Oblix eventually became the MOGURA robot arm used in industry. [4]

1979

The Stanford Cart crossed a chair-filled room without human assistance. The cart had a TV camera mounted on a rail which took pictures from multiple angles and relayed them to a computer. The computer analyzed the distance between the cart and the obstacles. [2]

1979

Hiroshi Makino of Yamanashi University designed the Selective Compliant Articulated Robot Arm (SCARA) for assembly jobs in factories.

1980

Quasi-dynamic walking was first realized by WL-9DR. It used a micro-computer as the controller. It could take one step every 10 seconds. It was developed by Ichiro Kato at the Department of Mechanical Engineering School of Science and Engineering, Waseda University, Tokyo. [4]
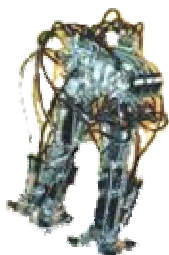
1981

Shigeo Hirose developed Titan II. It is a quadruped which could climb stairs. Picture is of Titan III, which is a successor to Titan II. [4]
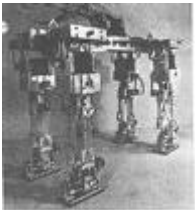
1985

Created by the General Robotics Corp. the RB5X was a programmable robot equipped with infrared sensors, remote audio/video transmission, bump sensors, and a voice synthesizer. It had software that could enable it to learn about its environment. [4]

1985

Waseda Hitachi Leg-11 (WHL-11) was a biped robot developed by Hitachi Ltd. It was capable of static walking on a flat surface. It was able to turn and could take a step every 13 seconds. [4]

1985

A four legged walking machine, Collie1, was developed by H. Miura at the University of Tokyo. The machine had 3 degrees of freedom per leg. [4]
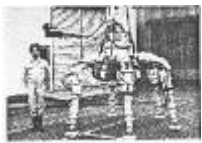
1985

The Melwalk3 was developed at Namiki Tsukuba Science City and was a six-legged walking machine.

1988

The first HelpMate service robot went to work at Danbury Hospital in Connecticut.

1989

Aquarobot, a walking robot for undersea use, was created at the Robotics Laboratory at the Ministry of Transport in Japan. [4]

1989

Developed by Kato Corporation, the WL12RIII was the first biped walking robot which was able to walk on a terrain stabilized by trunk motion. It could walk up and down stairs and could take a single step every 0.64 seconds. [4]

1990

iRobot Corporation was founded by Rodney Brooks, Colin Angle and Helen Greiner and produced domestic and military robots.

1993

Dante explored Mt. Erebrus in Antarctica. The 8-legged walking robot was developed at Carnegie-Mellon University. However, the mission failed when its tether broke. [4]Dante II subsequently explored Mt. Spurr in Alaska in 2004. This was a more robust version of Dante I.

1996

RoboTuna was created by David Barrett at MIT. The robot was used to study how fish swim. [4]

1996

Honda created the P2, which was the first major step in creating their ASIMO. The P2 was the first self-regulating, bipedal humanoid robot. [4]
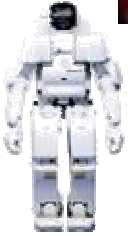
1997

NASA's PathFinder landed on Mars. The wheeled robotic rover sent images and data about Mars back to Earth.
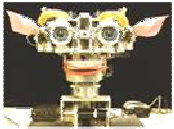

1997

IBM's deep blue supercomputer beat the champion Gary Kasparov at a chess match. This represented the first time a machine beat a grand champion chess player.

1997

Honda created the P3, the second major step in creating their ASIMO. The P3 was Honda's first completely autonomous humanoid robot.

1998

Dr. Cynthia created Kismet, a robotic creature that interacted emotionally with people.

1998

LEGO released their MINDSTORMS robotic development product line, which is a system for inventing robots using a modular design and LEGO plastic bricks.

1998

Campbell Aird was fitted with the first bionic arm called the Edinburg Modular Arm System (EMAS). [4]

1999

Sony released the first Aibo robotic dog.

1999

Mitsubishi created a robot fish. The intention was to create a robotic version of an extinct species of fish.

1999

Personal Robots released the Cye robot. It performed a variety of household chores, such as delivering mail, carrying dishes, and vacuuming. It was created by Probotics Inc. [4]

2000

Sony unveiled the Sony Dream Robots (SDR) at Robodex. SDR was able to recognize 10 different faces, expresses emotion through speech and body language, and can walk on flat as well as irregular surfaces. Image of QRIO [4]

2001

iRobot Packbots searched through the rubble of the world Trade Center. Subsequent versions of the Packbot robots are used in Afghanistan and Iraq.

2001

MD Robotics of Canada built the Space Station Remote Manipulator System (SSRMS). It was successfully launched and worked to assemble the International Space Station. [4]

2002

Honda created the Advanced Step in Innovative Mobility (ASIMO). It is intended to be a personal assistant. It recognizes its owner's face, voice, and name. Can read email and is capable of streaming video from its camera to a PC. [4]

2002

iRobot released the first generation of Roomba robotic vacuum cleaners.

2003

As part of their mission to explore Mars, NASA launched twin robotic rovers on June 10 and July 7, 2003 called Spirit and Sojourner.

2003

RobotShop Distribution Inc. was founded to provide today's society with domestic and professional robot technology that can help increase the pleasure, knowledge liberty and security of individuals.

2005

The Korean Institute of Science and Technology (KIST), created HUBO, and claims it is the smartest mobile robot in the world. This robot is linked to a computer via a high-speed wireless connection; the computer does all of the thinking for the robot.

2005

Cornell University created self-replicating robots.

This timeline ends in 2005. Information between 2005 and the present can be found in the "Revolution of Robotics" page on the *RobotShop Learning Center*.

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