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| ONLINE BANKING | SPAM FILTER | SMART TOYS | CHATBOTS |
| **How:** Uses computer vision to recognize human handwriting on images of checks**Examples:** Banking apps to scan checks for mobile deposit | **How:** Learns to identify spam emails based on past user interactions and patterns**Examples:** Gmail, Outlook, Yahoo email spam folders | **How:** Use computer vision to navigate, voice recognition and language processing to understand commands**Examples:** Cozmo, My Friend Kayla | **How:** Use naturallanguage processing to understand responses **Examples:** Customer service chatbots online and on phone hotlines |
| SMART CAR | AI HEALTHMONITOR | SMART CAMERA | SOCIAL MEDIA |
| **How:** Self-driving cars use computer vision, sensors, and machine learning to navigate**Examples:** Tesla, auto parallel park feature, blindspot detection | **How:** Uses sensor data to detect abnormalities in health patterns, like heartbeat**Examples:** Apple watch | **How:** Uses computer vision and light sensors to detect people/motion **Examples:** Nest security camera, smart baby monitor | **How:** Algorithms sort newsfeed items based on your viewing history **Examples:** Twitter, Instagram, TikTok, Facebook |
| SMART SPEAKER | SENTIMENT ANALYSIS | SMART THERMOSTAT | VIDEO GAME CHARACTER |
| **How:** Uses voice recognition and language understanding to process commands**Examples:** Google Home, Amazon Alexa, Siri | **How:** Analyzes text/voice to determine sentiment **Examples:** Many customer service systems | **How:** Learns your heating/ cooling habits over time **Examples:** Nest thermostat, Ecobee, Emerson Sensi | **How:** Uses AI to navigate in world and make decisions**Examples:** Skyrim dragon, Pokemon, Minecraft skeleton |
| FACIAL RECOGNITION | RIDE SHARE | SEARCH ENGINE | TARGETED ADS |
| **How:** Recognizes facial features based on faces it has seen before **Examples:** Surveillance, Snapchat filters, unlocking phone | **How:** Fare price, trip time, and route calculated based on current conditions and past examples**Examples:** Uber, Lyft | **How:** Prioritizes resultsbased on your history and history of others like you **Examples:** Google, Bing, DuckDuckGo | **How:** Shows you adsbased on your viewing history**Examples:** Ads on social media, websites, online news |
| SEARCH HISTORY | MEMES | RECOMMENDATION SYSTEMS | SMART VACUUM |
| A list of phrases people have searched for, with the searchers’ emails | A collection of images of memes and a popularity score for each meme | **How:** Predicts what you will like based on your history**Examples:** Spotify, Apple Music, Netflix, Hulu,Amazon | **How:** Uses sensors and updates map in memory to navigate**Examples:** Roomba, Neato Botvac, Ecovacs Deebot |
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| TOUCH SENSOR | CAMERA | TEXTS | EMAILS |
| **What:** Recognizes touch **How:** Change in conductivity from air **Uses:** Touchscreens, mousepads | **What:** Captures images and video of the world **How:** Focuses light that reflects off of objects **Uses:** Recording video, taking pictures | A dataset of texts withtheir content, sender, receiver, and date | A dataset of emails withtheir content, sender, and receiver, and date |
| SOUND SENSOR | SMELL SENSOR | FACEBOOKPOSTS | TWEETS |
| **What:** Detects sound **How:** Changes in air pressure**Uses:** Security system, voice assistant | **What:** Senses smell **How:** Chemical gas sen- sors**Uses:** Detecting toxins, explosives | A dataset of Facebookposts with the poster’s name, number of likes, and date | A dataset of tweets withthe poster’s username, number of likes and retweets, and date |
| PROXIMITYSENSOR | PRESSURESENSOR | WEATHERHISTORY | IMAGES |
| **What:** Detects presence of nearby objects**How:** Electromagnetic field**Uses:** Security systems | **What:** Pressure sensor **How:** Sensing strain in a material**Uses:** Keyboards, aircraft | History of weather ina particular city over the past year, including temperature and precipitation | A dataset of images ofa particular subject (e.g. dogs, tomatoes, plants, faces, etc.) |
| HEAT SENSOR | SPEED SENSOR | SONGS | DICTIONARY |
| **What:** Detects temperature**How:** Temperature differences cause voltage changes**Uses:** Cooking, AC | **What:** Detects speed **How:** Rotating magnet creates voltage**Uses:** Car speedometer | A dataset of audio files ofsongs and text files with the songs’ lyrics | A list of words in theEnglish language, including parts of speech and definitions |
| LIGHT SENSOR | INFRAREDSENSOR | BOOKS | ROUTES |
| **What:** Senses light **How:** Changes in Cadmium-Sulfide, a substance sensitive to light**Uses:** Lamps, brightness | **What:** Detects infrared radiation**How:** Emits radiation that is reflected back**Uses:** Night vision, detecthuman bodies | A dataset of book titles, summaries, and cover images | A dataset of routes driven by Uber drivers, orga- nized by driver ID number and including data suchas length of route andamount of traffic |
| control, agriculture |  |  |  |  |  |  |  |  |  |  |  |





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| PREDICTION | SORTING | GRIPPER | ELECTRIC CURRENT SENSOR |
| AI can output a prediction (e.g. about something a user might like) based on the input/algorithm | AI could output a list of inputs sorted according to the algorithm’s results | **What:** Opens and closes two “fingers”**How:** Compressed air**Uses:** Grasping items | **What:** Detects changes in electric sensor**How:** Magnetic field **Uses:** Power meters, surge protectors |
| NLP | REGRESSION | SUCTION CUP | STEPPER MOTOR |
| NLP algorithms analyzetext to extract information such as parts-of-speech, sentiment, or key ideas | A regression algorithmuses past data to predict the future—for example, using past home prices to predict the price of a new home on the market | **What:** Attaches to smooth surfaces**How:** Forcing air out, makes cup a vacuum **Uses:** Picking up or climbing on items | **What:** Rotates in specified steps/degrees **How:** Electrical power **Uses:** Precise rotational positioning of objects |
| DECISION TREES | PLANNING | SOLENOID | ARTIFICIALMUSCLE |
| Decision trees are like flow charts that help an algorithm move from observations about an item to a decision about the item’s category or value | Planning algorithms try to look ahead into probable future conditions and develop a sequence of steps to navigate a route or solve a problem | **What:** Produce linear motion over short distances**How:** By creating a magnetic field**Uses:** Latching systems,valves | **What:** Mimic a human muscle**How:** Changing pressure **Uses:** Machinery, medical devices |
| CLUSTERING | CLASSIFIER | SPEAKER | HYDRAULIC ACTUATOR |
| A clustering algorithmgroups items in a dataset together based on similarity. Items that are similar are close together, items that are not are far apart. | A classification algorithmuses a dataset to recognize future input—for example, using many pictures of cats to recognize a new cat image in the future | **What:** Generates noise**How:** Converts sound waves into mechanical movement that compresses air**Uses:** Playing music | **What:** Produce linear motion**How:** Liquid pressure **Uses:** construction equipment |
| REINFORCEMENT | CASE-BASED | VISUAL DISPLAY | LIGHT BULB |
| Reinforcement learningalgorithms learn patterns from continuous interaction with and feedback from the environment. | Case-based algorithmssave prior experiences as “cases” and learn lessons from them in the future, similar to how humans learn from experience. | A visual display such as a computer or TV screencan show different images or videos depending on the results | A light bulb can light up or change colors when a particular result is found |
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