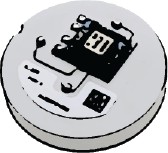




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| ONLINE BANKING | | | SPAM FILTER | | | SMART TOYS | | | CHATBOTS | | |
| **How:** Uses computer vision to recognize human handwriting on images of checks  **Examples:** Banking apps to scan checks for mobile deposit | | | **How:** Learns to identify 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 natural  language processing to understand responses **Examples:** Customer service chatbots online and on phone hotlines | | |
| SMART CAR | | | AI HEALTH  MONITOR | | | SMART CAMERA | | | SOCIAL MEDIA | | |
| **How:** Self-driving cars use computer vision, sensors, and machine learning to navigate  **Examples:** Tesla, auto parallel park feature, blind  spot 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 results  based on your history and history of others like you **Examples:** Google, Bing, DuckDuckGo | | | **How:** Shows you ads  based 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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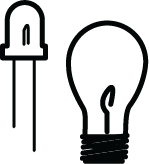
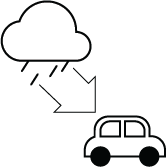




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| TOUCH SENSOR | | | CAMERA | | | TEXTS | | | EMAILS | | |
| **What:** Recognizes touch **How:** Change in conductivity from air **Uses:** Touchscreens, mousepads | | | **What:** Captures images and video of the world **How:** Focuses light that reflects off of objects **Uses:** Recording video, taking pictures | | | A dataset of texts with  their content, sender, receiver, and date | | | A dataset of emails with  their content, sender, and receiver, and date | | |
| SOUND SENSOR | | | SMELL SENSOR | | | FACEBOOK  POSTS | | | 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 Facebook  posts with the poster’s name, number of likes, and date | | | A dataset of tweets with  the poster’s username, number of likes and retweets, and date | | |
| PROXIMITY  SENSOR | | | PRESSURE  SENSOR | | | WEATHER  HISTORY | | | 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 in  a particular city over the past year, including temperature and precipitation | | | A dataset of images of  a 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 of  songs and text files with the songs’ lyrics | | | A list of words in the  English language, including parts of speech and definitions | | |
| LIGHT SENSOR | | | INFRARED  SENSOR | | | 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, detect  human 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 such  as length of route and  amount 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 analyze  text to extract information such as parts-of-speech, sentiment, or key ideas | | | A regression algorithm  uses 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 | | | ARTIFICIAL  MUSCLE | | |
| 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 algorithm  groups items in a dataset together based on similarity. Items that are similar are close together, items that are not are far apart. | | | A classification algorithm  uses 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 learning  algorithms learn patterns from continuous interaction with and feedback from the environment. | | | Case-based algorithms  save 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 screen  can 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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