| **TERM** | **DEFINITION** | **NENO** | **MAELEZO** |
| --- | --- | --- | --- |
| Activation Function | A mathematical function that determines the output of a neural network node based on its own input and weight. This allows networks to handle variety of complex tasks such as language processing, Image recognition and more. | Kazi ya Kuamsha/Kuamilisha/Dhima ya Uanzishaji/ Dhima chochezi | Hii ni kuonyesha matokeo kwa misingi ya michango binafsi na uzito wake |
| Adversarial Machine Learning | Machine Learning, which is behind AI and can be vulnerable to attacks. This leading it to-do what it was not designed for. Cybersecurity professionals call the process adversarial machine learning, which with malicious data, the machine learning models are tested to exploiting the model's weaknesses such as misclassification or errors. | Ujifunzaji kinzani kwa mashini | kuingiliwa kwa mashine ya ujifunzaji ya algoriti |
| Algorithm | An algorithm is a sequence of rules given to an AI machine to perform a task or solve a problem. Common algorithms include classification, regression, and clustering. | Algoriti | Algoriti ni mfuatano wa sheria zinazoingizwa kwenye mashini ya akili unde ili itekeleza jambo au kusuluhisha tatizo. Algoriti za kawaida ni kama uainishaji, kufanya makadirio na upangaji katika makundi. |
| Anomaly Detection | A process that detects rare events, which are outside of the norm. Such as weather spikes in July, not observed in years before. | Kugundua kasoro | Huu ni ugunduzi wa masuala adimu, matukio adimu ama maoni adimu ambayo yanaenda kinyume na data kusudiwa. |
| Artificial General Intelligence (AGI) | is understood as the overarching, and, as yet, unachieved, goal of designing a system with the ability to learn new skills and act intelligently in many domains, and which can mimic or even surpass human intelligence. Strong AI or AGI thus refers to a machine that has consciousness and can provide human-like responses. | Akili Unde ya Jumla/ Akili bunifu ya kijumla | inaeleweka kama lengo tondoti, na, ambalo bado halijafikiwa la kuunda mfumo ulio na uwezo wa kujifunza ujuzi mpya na kutenda kwa uerevu katika vikoa vingi na ambalo linaiga au hata kupita uerevu wa binadamu. AU au AGI thabiti inarejelea mashine ambayo ina ufahamu na inawea kutoa majibu sawa na ya binadamu. |
| Artificial Intelligence (AI) | AI stands for artificial intelligence, which is the simulation of human intelligence processes by machines or computer systems. AI can mimic human capabilities such as communication, learning, and decision-making. | Akili Unde (AU) | Akili unde ni kitendo cha mashini au mifumo ya kompyuta kuiga michakato ya akili ya binadamu. Akili unde inaweza kuiga uwezo wa binadamu kama mawasiliano, ujifunzaji an kufanya maamuzi |
| Artificial Life | Is a study named by Christopher Langton, an American theoretical biologist, in 1986. It focuses on computer simulation of life-like processes. | Maisha Unde | Huu ni uwanja wa ujifunzaji ambapo mtafiti anachunguza mfumo unaohusiana na maisha unde. |
| Autoencoders | Autoencoders are a type of artificial neural network used to learn efficient codings of unlabeled data (unsupervised learning). They are used for learning a lower-dimensional representation (encoding) for a higher-dimensional data. | Visimbaji otomatiki | Ni mashine elekezi ya modeli ya ujifunzaji ambayo hutumika kupunguza kiwango cha matokeo ya data kwa kuumbua tena |
| Automated Machine Learning (AML) | The process of automating the end-to-end process of applying machine learning to real-world problems. | Kujifunza kwa Mashine Kiotomatiki | Huu ni mchakato wa kutumia mashine ya ujifunzaji kwa shida halisia za ulimwengu. |
| Backpropagation | A method used in artificial neural networks to calculate the gradient of the loss function with respect to all the weights in the network. This method helps to minimize the error rate of the model. | Kueneza nyuma/ Dosari jumuishi | Hii njia ya kujaribu kujumuisha hasara ya kila nodi na kutilia mkazo ili kupunguza hasara kwa kupeana kila nodi kiwango cha juu cha dosari. |
| Bayesian Inference | A method of statistical inference in which Bayes' theorem is used to update the probability for a hypothesis as more evidence or information becomes available. | Maelekezo ya Bayesian | Hii ni njia ya kutoa maelezo ambapo mtafiti anatumia uwezekano amuzi kwa migao inayoweza kuzalisha data |
| Bayesian Networks | A type of probabilistic graphical model that represents a set of variables and their conditional dependencies via a directed acyclic graph. | Mitandao ya Bayesian | Hizi ni grafu za modeli ya uwezekano ambazo huwakilisha vigezo vilivyo na masharti tegemezi. |
| Bias and Variance | Bias is the error introduced by approximating a real-world problem which may oversimplify the model. Variance is the error introduced by the model's sensitivity to small fluctuations in the training set. | Upendeleo na Tofauti | Hii ni hali ya kuamini kuwa maoni, mawazo, Imani na hulka ya watu fulani ni bora bila kuzingatia vigezo vyote kabla ya maamuzi. Vigezo huchimua akili ili kuweza kufanya maamuzi yasiyo na upendeleo. |
| Bias-Variance Tradeoff | The property of a model that the decrease of bias increases the variance and vice versa. The aim is to find the right balance to minimize the total error. | Usawazishaji wa upendeleo na utofauti | Huu ni usawazishaji kati ya vianzio viwili vya dosari katika modeli ya utabiri unaojumuisha upendeleo na kigezo |
| Big Data | is the act of summarizing, grouping or otherwise organizing the raw data of a given data set into a summary form for statistical analysis. While this can and has been performed by humans in the past (through traditional statistical analysis), the age of Big Data ushers in the need for AI solutions to extract, recognize or extrapolate patterns in these incredibly large data sets, which are then used for a variety of applications. For instance, data aggregation is at work behind many of today’s recommender systems, grouping similar users together, or pairing a user with a new product, page or interest group. | Data Kubwa | ni kitendo cha kutoa muhtasari, kuweka kwenye makundi au vinginevyo kupanga data halisi kutokana na seti fulani ya data kwa muhtasari kwa ajili ya uchambuzi wa takwimu. Ingawa hii inaweza na imefanywa na binadamu simu za nyuma (kupitia uchambuzi wa jadi wa takwimu), enzi ya Data Kubwa imekuja na hitaji la suluhu za AU ili kuopoa, kutambua au kuchanganua mitindo kwenye seti hizi kubwa sana za data, ambazo kisha zinatumiwa kwa matumizi mbalimbali. Kwa mfano, ujumlishaji wa data ndiyo hutumika ndani ya mifumo mingi ya kipendekezaji ya leo, kuweka pamoja watumiaji wanaofanana, au kuoanisha mtumiaji na bidhaa, ukurasa au kikundi kipya cha mapendeleo. |
| Cellular Automata | A discrete model studied in computability theory, mathematics, physics, complexity science, theoretical biology, and microstructure modeling. | Automata ya Simu/ Seli automata | Hii ni seli inayozalisha uwezo wa lugha mbalimbali ambazo zinakosa ukawaida fulani wa kimaumbo. |
| Chatbot | is a type of virtual AI assistant (a computer program) designed to mimic conversation with a human user, typically over the internet or some virtual interface, via text or text and speech. Chatbots can provide useful information to users or direct them to appropriate resources and play a key role in addressing the needs of users at scale. | Boti ya Gumzo | ni aina ya mratibu wa AU mtandaoni (programu ya kompyuta) iliyoundwa kuiga mazungumzo na mtumiaji binadamu, kwa kawaida mtandaoni au kwenye kiolesura fulani cha mtandaoni, kupitia maandishi au maandishi na matamshi. Boti ya magumzo zinaweza kutoa taarifa muhimu kwa watumiaji au kuwaelekeza kwenye rasilimali zinazofaa na kuchukua nafsi muhimu katika kushughulikia mahitaji ya watumiaji katika kiwango. |
| Classification | data analysis process of organizing and labeling items in a collection into distinct categories or classes according to shared characteristics. This enables efficient information retrieval and analysis. It is widely used in various fields including machine learning, statistics, and pattern recognition. | Uainishaji | Huu ni upangaji wa vitu kwa kutegemea sifa bainifu. Upangaji huu hutoa makundi mbalimbali. |
| Cloud Computing | A technology that allows users to access and use scalable computer system resources, especially data storage and computing power, without direct active management by the user. It enables fast scaling up or down of resources to meet demand, often through a pay-as-you-go model. | Uhifadhi kwa intaneti | Huu ni utekelezaji wa huduma kompyuta unaohusu; sava, uhifadhi, data msingi na akili bunifu ya mtandao |
| Clustering | The process of organizing a set of objects into groups where objects in the same group are more similar to each other than to those in other groups. | Upangaji wa makundi | Huu ni upangaji wa seti ya vitu ili vitu vilivyo katika kundi moja vionekane kuwa vingi. |
| Cognitive Computing | Cognitive computing is essentially the same as AI. It’s a computerized model that focuses on mimicking human thought processes such as pattern recognition and learning. Marketing teams sometimes use this term to eliminate the sci-fi mystique of AI. | Kompyuta ya Utambuzi | Komputa ya utambuzi kimsingi ni sawa na Akili Unde. Ni kiundi cha kikompyuta ambacho hujikita katika uigaji wa michakato ya Mawazo ya binadamu kama vile utambuzi wa ruwaza na ujifunzaji. Timu za masoko wakati mwingine hutumia istilahi hii kuepukana na sci-mystique ya Akili Unde |
| Computer Vision | A field of AI that trains computers to interpret and understand visual information from the world. It basically gives a computer an eye. | Maono ya Kompyuta | Hii ni mbinu ya kupokea , kutengeneza , kuchanganua na kuelewa mambo ya kidijitali na kupata data ya kiwango cha juu ili kuunda takwimu au ishara ya ujumbe. |
| Content Moderation | describes the process by which humans or Artificial Intelligence decide which content is allowed on a specific platform or forum, typically in alignment with the platform or forum’s community standards, guidelines, or terms of service. Today, most major platforms are moderated by a combination of humans and AI systems. In part, this is due to the striking amount of new content which is uploaded every day—far too much for humans alone to handle. While AI-powered moderation is an efficient solution to this problem, it’s inability to detect linguistic nuance, such as humor or sarcasm on one hand, combined with pressure from various governmental bodies to censor unfavorable content across platforms on the other, may threaten freedom of expression and lead to increased online censorship. | Ukaguzi wa Maudhui/ usawazishaji wa yaliyomo | inaelezea mchakato ambapo binadamu au Akili Unde huamua maudhui ambayo yanaruhusiwa kwenye mfumo au jukwaa mahususi, kwa kawaida kwa kuambatana na viwango vya jumuiya, miongozo au sheria na masharti ya mfumo au jukwaa hilo. Leo, mifumo mingi mikuu inakaguliwa na binadamu pamoja na Mifumo ya AU. Kwa upande mmoja, hii inatokana na kiasi kikubwa cha maudhui ambayo hupakiwa kila siku, ambayo ni kubwa mno kwa binadamu kushughulikia peke yake. Ingawa ukaguzi unaoendeshwa na AU ni suluhu bora kwa tatizo hili, kutoweza kwake kugundua utofauti wa kiisimu, kama vile ucheshi au kejeli kwa upande mmoja, pamoja na shinikizo kutoka katika mashirika ya serikali kudhibiti maudhui yasiyofaa kwenye mifumo yote kwa upande mwingine, inaweza kutishia uhuru wa kujieleza na kusababisha kuongeza kwa udhibiti wa mawasiliano mtandaoni. |
| Continual Learning | A set of techniques that train machine learning models using a data sample as it becomes available. | Kuendelea Kujifunza | Hii ni seti ya mbinu za kuandaa modeli za mashine za ujifunzaji kwa kutumia sampuli ya data inapopatikana |
| Convolution | A process of combining two sources of information. | Uunganishaji | Utaratibu wa kuunganisha vyanzo viwili vya taarifa |
| Cross-Validation | A technique for assessing how the results of a statistical analysis will generalize to an independent data set. | Uthibitishaji kwa kutumia data tofauti/Uthibitishaji wa utendakazi wa mashini | Hii ni mbinu ya kupima ujifunzaji katika modeli ya utabiri. |
| Data | The main building blocks of the digital world, representing real-world entities, events, or concepts in formats that can be stored, transmitted, and processed by computers and other digital systems. These formats include, but are not limited to, numbers, text, images, audio, and video. | Data/ Deta | Hii ni jumla ya habari au sampuli ambayo huchanganuliwa kimaelezo ama kitakwimu |
| Data mining | Data mining is the process of sorting through large data sets to identify patterns that can improve models or solve problems. | Uchimbaji data | Uchimbaji data ni mchakato wa kupanga data kutokana seti kubwa ili kuchagua ruwaza zinazoweza kuboresha modeli au kutatua matatizo. |
| Data Science | An interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data. | Sayansi ya Data | Hii ni mbinu ya kijumla ambayo hujumuisha sifa na utendaji na hutumika kuchanganua data kubwa kutokana na utafiti. |
| Data set | is sometimes called a ‘database’, a data set is simply a collection of structured data. In other words, it’s a collection of things like facts, measurements, observations, images, text, audio or video, or representations thereof. Data sets are integral to Artificial Intelligence. In fact, without data sets, AI would not be able to learn, perceive, categorize, speak, listen or interpret, to name just a few. Data sets can be large or small, public or private, balanced or biased, but no matter the details, data sets provide the backbone for bottom-up, machine learning, or what we rightly call data- driven AI. | Seti ya Data | wakati mwingine huitwa ‘kanzidata’, seti ya data ni mkusanyiko wa data iliyoundwa. Kwa maneno mengine, ni mkusanyiko wa mambo kama vile ukweli, vipimo, mitazamo, picha, matini, sauti au video au uwakilisho wake. Seti za data ni muhimu kwa umaizi bandia. Ukweli, bila seti za data, AU haingeweza kujifunza, kudhani, kuainisha, kuzungumza, kusikiliza au kufasiri miongoni mwa mambo mengine. Seti za data zinaweza kuwa kubwa au ndogo, za umma au za faragha, zilizosawazishwa au zenye upendeleo, lakini licha ya maelezo yake, seti za data zinatoa uti wa mgongo wa chini- juu, mafunzo ya mashine au kile tunachokiita kwa usahihi kama AU inayoendeshwa na data. |
| Decision Support Systems | A computer-based system that supports the decision-making process of an organization by analyzing large amounts of data. | Mifumo ya Usaidizi wa Maamuzi | Huu ni mfumo wa kompyuta unaoimarisha matokeo ya kampuni inapofanya maamuzi. Huchanganua data kubwa. |
| Decision Trees | A decision support tool that uses a tree-like model of decisions and their possible consequences. | Miti ya Uamuzi | Hii huanza kwa nodi ambayo huunda matawi ya matokeo yanayonuiwa kisha nodi hizo kuunda matawi yanayoashiria uwezekano mwingine |
| Deep Belief Networks (DBN) | A generative graphical model that learns to probabilistically reconstruct its inputs. | Mitandao ya Kina | Hii ni modeli zalishi ambayo neroni kutoka viwango mbalimbali hulinganishwa lakini neroni katika kiwango sawa hazilinganishwi. |
|  | Deep learning is a function of AI that imitates the human brain by learning from how it structures and processes information to make decisions. Instead of relying on an algorithm that can only perform one specific task, this subset of machine learning can learn from unstructured data without supervision. | Kujifunza kwa Kina | Ujifunzaji kwa kina ni dhima ya akili unde ambayo huiga ubongo wa binadamu kwa kujifunza namna unavyounda na kuchakata taarifa ili kufanya maamuzi. Badala ya kutegemea algoriti ambayo inatekeleza jukumu moja mahususi, kijisehemu cha ujifunzaji kwa njia ya mashine hiki kinaweza kujifunza bila usimamizi kupitia data isiyopangiliwa. |
| Deep Reinforcement Learning | A method that combines reinforcement learning and deep learning using neural networks. | Mafunzo ya Uimarishaji wa Kina | Hii ni mbinu inayojumuisha ujifunzaji wa msukumo na ule wa kina wa neurali. Inatokana na adhabu ama tunu. |
| Dimensionality Reduction | A process of reducing the number of random variables under consideration by obtaining a set of principal variables. | Upunguzaji uzito wa sifa/ Uwakilishi wa seti ya data ya chini | Hii ni mbinu inayowakilisha seti ya data kwa kutumia idadi ndogo ya sifa wakati unapotafuta data halisia iliyo na sifa zenye maana. |
| Ensemble Learning | The process of using multiple models to solve the same problem, improving the performance. | Mafunzo Unganishi | Hii ni ujumuishaji wa modeli mbalimbali kila mojawapo ikiwa na uzuri na ubaya wake ili kupata matokeo mazuri. |
| Ensemble Methods | Techniques that create multiple models and then combine them to produce improved results. | Mbinu Unganishi | Haya ni matumizi ya mbinu mbalimbali katika aligorathimu ili kupata matokeo tabiri katika utendaji. |
| Ethics of AI | AI ethics refers to the issues that AI stakeholders such as engineers and government officials must consider to ensure that the technology is developed and used responsibly. This means adopting and implementing systems that support a safe, secure, unbiased, and environmentally friendly approach to artificial intelligence. | Maadili katika AI | Maadili katika AU ni masuala ambayo wadau kama wahandisi na maafisa wa serikali hawana budi kuzingatia kuhakikisha kwamba teknolojia inaendelezwa na kutumiwa kwa kuwajibika. Inamaanisha upitishaji na utekelezaji wa mifumo inayowezesha michakato salama, isiyo na upendeleo, na inayokidhi vigezo vya mazingira kwa akili unde |
| Evolutionary Computation | A branch of AI used for solving complex optimization problems through mechanisms inspired by biological evolution. | Mahesabu ya Mageuzi/ Tawi la mahesabu ya mageuzi | Hili ni tawi la AU linalotumika Zaidi kwa kutatua shida zilizo na vigezo tofauti. |
| Evolutionary Strategies | Techniques that use mechanisms inspired by biological evolution, such as reproduction, mutation, recombination, and selection. | Mikakati ya Mageuzi | Hii ni mbinu spesheli ambayo mtu mmoja katika jamii hupokezwa ujuzi |
| Expert Systems | Computer systems that emulate the decision-making ability of a human expert. | Mifumo ya Wataalam | Katika akili bunifu huu ni mfumo wa kompyuta ambao unaiga uwezo wa wa kufanya maamuzi wa wataalamu. |
| Explainable AI | Processes and methods that allow human users to comprehend and trust the results and output created by machine learning algorithms. | AU inayoeleweka/ AU Elezi | Mchakato na mbinu zinazoruhusu wanadamu kuelewa na kuamini matokeo yam ashine ya aligorithimu. |
| Fairness in AI | The principles that ensure AI systems are unbiased and treat all users fairly. | Usawa katika AU | Huu ni uwekaji wa sheria zilizo sawa na zinazoingiliana na sheria za kupinga ubaguzi na kulinda akili bunifu. |
| Fault Diagnosis | The process of identifying and understanding the faults or errors in a system. | Utambuzi wa Makosa | Huu ni mchakato wa kutambua tatizo kutokana na dalili zake, kuweka ufahamu na kuchanganua matokeo yake. |
| Feature Engineering | The process of using domain knowledge to extract features from raw data to improve the performance of machine learning models. | Uhandisi wa Kipengele | Huu ni mchakato wa kuteua, kufanya na kubadili data katika vipengele vinavyoweza kutumika katika ujifunzaji |
| Fine-Tuning | The process of making small adjustments to a pre-trained model to improve its performance on a specific task. | Uboreshaji | Hii kufanya mabadiliko madogo kwa mashine ili kuleta matokeo ya juu sana au utendakazi wa juu sana |
| Fuzzy Logic | A form of logic that allows for degrees of truth rather than the usual true or false (1 or 0) Boolean logic. | Mantiki Isiyoeleweka | Huu ni mwelekeo wa kimantiki ambao huruhusu mambo mengi kuundwa chini ya kigezo kimoja |
| Gaussian Mixture Model (GMM) | A probabilistic model that assumes all the data points are generated from a mixture of several Gaussian distributions with unknown parameters. | Kiunzi cha Mchanganyiko wa Gaussian/ Modeli ya mchanganyiko ya Gaussian | Hii ni mbinu ya ujifunzaji ya mashine ambayo hutambua uwezekano wa kila data kupatikana katika kundi fulani. |
| Generative AI | Generative AI is s type of technology that uses AI to create content, including text, video, code and images. A generative AI system is trained using large amounts of data, so that it can find patterns for generating new content. | AI Zalishi | Akili Unde Zalishi ni aina ya technolojia inayotumia AU kuunda data ikiwa ni Pamoja na matini, video, msimbo na picha. AU Zalishi hufundishwa kutumia kiwango kikubwa cha data ili iweze kutafuta ruwaza za kuunda taarifa mpya. |
| Generative Models | Techniques that enable computers to create new data based on the input data. | Viunzi zalishi | Hii ni mbinu inayofanikisha watumizi kompyuta kuunda habari mpya kwa misingi ya michango tofautitofauti. |
| Genetic Algorithms | Algorithms used for optimization that are based on the process of natural selection. | AU ya Kimaumbile/Aligorithimu ya jenetiki/ Mbinu suluhu ya jenetiki | Hii ni mbinu ya kutatua shida kwa misingi teuzi ya uhalisia, mchakato uletao mabadiliko ya kibayolojia |
| Genetic Programming | A type of evolutionary algorithm that evolves programs to solve specific problems. | Upangaji wa Kinasaba | Hii ni mbinu ya kimpangilio inayowezesha kompyuta kutoa suluhu kwa matatizo kuanzia kwa kiwango cha juu . |
| Gradient Descent | An optimization algorithm used to minimize the loss function in machine learning models. | Kushuka kwa gradienti | Hii ni awamu ya kwanza inayotumika kwenye ujifunzaji wa mashine kuonyesha kiwango cha chini ama cha juu katika utendakazi |
| Graph Neural Networks (GNN) | A type of neural network that directly operates on the graph structure. | Grafu ya neorali | Huu ni mfumo wa kimuundo wa data unaojumuisha tezi au nodi na ili kutoa uhusiano kati yazo. |
| Hallucination | Hallucination refers to an incorrect response from an AI system, or false information in an output that is presented as factual information. | Halusinesheni/ ukiushi | Halusinesheni/Ukiushi hurejelea jibu lisilo sahihi kutokana na mfumo wa akili unde au taarifa ghushi katika matokeo yanayowasilishwa kama taarifa yenye ushahidi |
| Hyperparameters | Parameters that are set before the learning process begins and control the learning process. | Vigezo vya juu/ viwango vya juu | Haya ni baadhi ya mambo wanasayansi wa data hutumia ili kupima modeli ya maandalizi ya mashine |
| Image Recognition | The ability of a machine to identify objects, people, places, and actions in images. | Utambuzi wa Picha | Uwezo wa mashine kutambua picha ya kitu |
| Inference | The process of deriving logical conclusions from premises known or assumed to be true. | Makisio | Hii ni hali ya mashine kutokuwa na uhakika wakati wa kutoa uamuzi |
| Long Short-Term Memory (LSTM) | A type of recurrent neural network capable of learning long-term dependencies. | Kumbukumbu ya muda Mrefu -mfupi | Huu ni uwezo mashine kuweza kuweka habari kwa muda mfupi au mrefu |
| Loss Function | A method of evaluating how well a specific algorithm models the given data. | Dhima ya kubaini kasoro | Hii ni mbinu ya kutathmini uwezo wa kukumbuka data |
| Machine Learning (ML) | is also called ‘data-driven’ or ‘bottom-up’ AI, machine learning is an adaptive type of algorithmic process which allows computers to learn from experience, learn by example, or learn by analogy, using large amounts of data, where the learning processes improve the performance of the system over time. Closely related to Artificial Neural Networks (ANNs), many machine learning practices are inspired by the structure of the human brain. ANNs use very simple and highly connected processors (called neurons) with weighted links, which pass signals from one neuron to another. The learning process occurs when these weights are adjusted as the system receives training data input, eventually storing the ‘trained’ rules required for correctly solving a given problem — such as classification or pattern recognition — which are used in decision-making when new data is fed into the system. | Kujifunza kwa Mashine/ ujifunzaji wa mashine | inaitwa pia AU ‘inayotawaliwa na data’ au ‘chini-juu’, mafunzo ya mashine ni aina ya mchakato wa kialgoriti inayowezesha kompyuta kujifunza kutokana na uzoefu, ujifunzaji kwa mfano, au ujifunzaji kwa mlinganisho, kwa kutumia kiasi kikubwa cha data, ambapo michakato ya ujifunzaji huboresha utendaji wa mfumo huo kwa muda. Ikiwa inahusiana kwa karibu na Mitandao ya Neva Unde, mafunzo mengi ya mashini huchochewa na muundo wa ubongo wa binadamu. Mitandano Nurali Unde hutumia vichakataji rahisi vilivyounganishwa kwa hali ya juu (huiitwa nuroni) zenye viungo vilivyo na uzani, ambavyo hupitia ishara kutoka kwenye nuroni moja hadi nyingine. Mchakato wa kujifunza hutokea wakati mizani hii inaporekebishwa huku mfumo ukiendelea kupokea mafunzo ya kuingiza data, hatimaye ikihifadhi sheria ‘zilizofunzwa’ zinazohitajika ili kutatua tatizo fulani kwa usahihi — kama vile uanishaji au utambuzi wa mitindo — ambayo hutumiwa katika kufanya uamuzi data mpya inapoingizwa kwenye mfumo. |
| Machine Translation | The process of using computers to translate text from one language to another. | Tafsiri ya Mashine | Huku ni kutafsiri maneno ya lugha moja hadi nyingine k.v Kiingereza kwa Kiswahili kwa kusaidiwa na mashine ya tafsiri |
| Markov Chain | A mathematical system that undergoes transitions from one state to another on a state space. | Mnyororo wa Markov | Uamuzi wa jambo hutegemea misingi ya tukio la hivi punde |
| Markov Chain Monte Carlo (MCMC) | A method for sampling from a probability distribution based on constructing a Markov chain. | Mkururo wa Markov Monte Carlo | Hii ni mbinu ambayo hutoa uamuzi wa uwezekano wa jambo kwa misingi ya tukio lililotokea hivi karibuni |
| Markov Decision Process (MDP) | A mathematical process for making decisions in situations where outcomes are partly random and partly under the control of a decision maker. | Mchakato wa Uamuzi wa Markov/ mparanyo wa uamuzi wa Markov | Huu ni mchakato wa kiuwamuzi ambapo matokeo huwa nasibu na ya kupimwa. |
| Model | A simplified representation used to explain the workings of a real-world system or event. | Kiunzi/Modeli | Hiki ni kitu cha kuelekeza mtu katika ujifunzaji au kipimo cha utendaji |
| Model Interpretability | The degree to which a human can understand the cause of a decision made by a machine learning model. | Ufafanuzi wa kiunzi/Kufasiri modeli au kielelezo | Huu ni uwezo wa kuweza kutoa ufafanuzi wa dhana kutumia modeli au kielelezo awali |
| Model-Based Reinforcement Learning | A method where the learning agent uses a model of the environment to make decisions and improve its performance. | Ujifunzaji wenye msingi wa kiunzi/ ujifunzaji wenye msingi elekevu | Huu ni upangaji wa mikakati ya ujifunzaji ukiwa umeelewa kanuni kwa kuiga kielelezo au modeli awali. |
| Models | Simplified representations of reality that help us understand, explain, and predict real-world phenomena. | Vielelezo /Modeli | Hiki ni kitu cha kuigwa na cha kuonekana katika mchakato wa ujifunzaji au utekelezaji wa jambo. Huonyesha utaratibu wa kufanya jambo kwa kutoa mielekeo tofautitofauti. |
| Monte Carlo Simulation | A technique used to understand the impact of risk and uncertainty in prediction and forecasting models. | Mbinu ya Uigaji ya Monte Carlo | Hii ni mbinu ya kuiga ambayo hutabiri uwezekano wa kutokea kwa matukio yasiyojulikana |
| Naive Bayes | A family of simple probabilistic classifiers based on applying Bayes' theorem with strong independence assumptions between the features. | Mchakato wa uwezekano | Hii hutoa modeli ya ugawaji wa mchango wa kundi fulani au kategoria. Hailengi sana sifa ziletazo utofauti wa kimakundi |
| Named Entity Recognition (NER) | A process in natural language processing that identifies and classifies key elements from text into predefined categories. | Utambuzi wa Huluki zenye majina/ Utambuzi wa kiingilio jina | Huu ni mchakato wa kiuhalisia wa lugha unaotoa utambuzi wa habari za mtu na kuzipanga katika kategoria kama vile jina, jamaa, msimbo, mahali, muda, umri, utajiri, jinsia na hulka. |
| Natural Language Processing (NLP) | is the branch of Artificial Intelligence research dedicated to giving computers the ability to understand text and spoken words in ways similar to humans. Typically, NLP combines traditional linguistic methods such as the rule-based modelling of a language, with statistical or machine learning methods. Traditionally a hard problem in AI research, natural language processing has greatly improved with the use of machine learning, and can be found in many everyday AI applications such as voice assistants, speech-to-text dictation software, automated translation and chatbots. | Uchakataji wa Lugha Asilia (ULA) | ni tawi la utafiti wa umaizi bandia linaloshughulikia kuzipa kompyuta uwezo wa kuelewa matini na maneno yanayozungumzwa na binadamu. Kwa kawaida, NLP hujumuisha mbinu za kale za kisiimu kama vile miundo iliyojikita katika kanuni ya lugha, na mbinu za takwimu au za mafunzo ya mashine. Ikiwa ni tatizo gumu kwa kawaida katika utafiti wa AU, uchakataji wa lugha halisi umeimarika pakubwa kwa matumizi ya mafunzo ya mashine, na unaweza kupatikana katika programu nyingi za AU za kila siku kama vile miratibu ya sauti, programu za sauti hadi matini, tafsiri otomatiki na boti za gumzo. |
| Neural Networks | A neural network is a deep learning technique designed to resemble the human brain’s structure. Neural networks require large data sets to perform calculations and create outputs, which enables features like speech and vision recognition. | Mitandao ya Neva | Mtandao wa neva ni mbinu ya ujifunzaji wa kina iliyoundwa ili kufanana na muundo wa ubongo wa binadamu. Mitandao ya Neva inahitaji seti kubwa za data ili kufanya hesabu na kuunda matokeo, ambayo huwezesha vipengele kama vile utambuzi wa matamshi na maono. |
| Neuroevolution | The use of evolutionary algorithms to optimize artificial neural networks. | Mageuzi ya neva | Haya ni matumizi ya akili bunifu ya algoriti ili kuleta mageuzi ya kindani |
| Optimization | The process of making something as effective or functional as possible. | Uboreshaji | Hiki ni kitendo cha kukifanya kitu kuwa kizuri Zaidi ama matumizi mazuri sana ya hali au raslimali. |
| Overfitting | Overfitting occurs in machine learning training when the algorithm can only work on specific examples within the training data. A typical functioning AI model should be able to generalize patterns in the data to tackle new tasks. | Ufaafu kupita kiasi | Ufaafu kupita kiasi hutokea katika majaribio ya ujifunzaji kwa kutumia mashine algoriti katika data ya mafunzo. Modeli faafu ya Akili Unde inatakiwa kuwa na uwezo wa kujumlisha ruwaza katika data ili kushughulikia majukumu mapya. |
| Pattern Recognition | Pattern recognition is the method of using computer algorithms to analyze, detect, and label regularities in data. This informs how the data gets classified into different categories. | Utambuzi wa Ruwaza | Utambuzi wa ruwaza ni mbinu ya kutumia algoriti za kompyuta kuchambua, kutambua na kuonyesha makosa katika data. Hil huonyesha namna data inavyopangiliwa katika makundi tofauti |
| Predictive analytics | Predictive analytics is a type of analytics that uses technology to predict what will happen in a specific time frame based on historical data and patterns. | Uchanganuzi wa Kutabiri | Uchanganuzi tabirifu ni aina ya uchanganuzi inayotumia teknolojia kutabiri kinachoweza kutokea ikiwa kalingana na muda mahususi maalum kuhusu data na ruwaza za kihistoria. |
| Principal Component Analysis (PCA) | A technique used to reduce the dimensionality of a data set by transforming it into a new set of variables. | Uchambuzi wa Kipengele Kikuu | Hii ni mbinu inayotumika kupunguza upana wa data kwa kuiweka katika seti ndogo ya hifadhi. |
| Privacy-Preserving AI | Systems that ensure user data remains confidential and secure. | AI ya Kuhifadhi Faragha | Hii ni mfumo unaowezesha habari za watumizi mtandao kuwekwa siri na wanaopeana huduma |
| Probabilistic Programming | An input that a user feeds to an AI system to get a desired result or output. | Upangaji kwa Uwezekano | Hii hufanywa kutumia kompyuta kwa kuandika programu, kulenga umuhimu wa maoni tofauti na kutathmini programu hiyo ili kupata matokeo. |
| Prompt | A prompt is an input that a user feeds to an AI system to get a desired result or output. | Ingizo /pupa | Ingizo ambalo mtumiaji analitumia katika mfumo wa Akili unde ili kupata matokeo yanayohitajika au yanayofaa. |
| Random Forest | An ensemble learning method for classification and regression that operates by constructing multiple decision trees. | Mashine Msitu Nasibu | Hii hulenga matokeo mbalimbali ya miti nasibu ili kupata matokeo maalum. |
| Recommender Systems | Systems that use data to predict and recommend items to users based on their preferences and behaviors. | Mifumo ya Kupendekeza | Haya ni mashine ya ujifunzaji ambayo hutumia data ili kutabiri, kulenga ili kubaini kilichokusudiwa kutokana na maoni mbalimbali |
| Recurrent Networks | Neural networks where connections between nodes can create cycles, enabling them to maintain a memory of previous inputs. | Mitandao ya kawaida/mara kwa mara | Hii ni modeli itowayo mchakato na kubadili data ya ndani ili kuzalisha data maalum ya matokeo |
| Regression | A statistical method used to determine the strength and character of the relationship between one dependent variable and one or more independent variables. | Kurudi nyuma | Hii ni mbinu inayotumika kubaini uwezo na tabia za uhusiano kati ya mawazo yasiyo huru na yaliyo huru |
| Reinforcement Learning | Reinforcement learning is a type of machine learning in which an algorithm learns by interacting with its environment and then is either rewarded or penalized based on its actions. | Kuimarisha Mafunzo | Kuimarisha mafunzo ni aina ya ujifunzaji kwa mashini ambapo algoriti hujifunza kwa kushirikiana na mazingira na badaye huzawadiwa au adhibiwa kulingana na vitendo vyake. |
| Reinforcement Learning Agent | An agent that learns by interacting with its environment, making decisions, and learning from feedback. | Wakala wa Mafunzo | Wakala anayejifunza kwa kuelewa, kufasiri mazingira, kutoa maamuzi na kujifunza kwa kukisia. |
| Reinforcement Learning Algorithms | Algorithms used in reinforcement learning to solve various problems by using trial and error methods. | Algoriti za Kuimarisha Mafunzo | ni mashine ya ujifunzaji ya alogariti ambayo hujifunza kutatua shida tofautitifauti kwa kutumia mbinu ya kukisia. |
| Robotics | The use of robots in creating, constructing, and implementing various tasks. | Robotiki | ni matumizi ya roboti katika kuunda, kujenga na kutekeleza masuala mbalimbali |
| Self-Organizing Maps (SOM) | A type of artificial neural network that is trained using unsupervised learning to produce a low-dimensional representation of the input space. | Ramani Zinazojipanga | Hizi ni ramani zilizo na data ya mpangilio wa maandalizi. Huonyesha sana mitindo tawala. Hutumika katika kusampulisha na kupanga vitu katika makundi madogo. |
| Semantic Analysis | The process of using AI to analyze the tone and opinion of a given text. | Uchambuzi wa kisemantiki | Huu ni uchanganuzi wa maana ya msamiati kwa misingi ya mchakato wa uundaji maneno katika lugha yoyote. |
| Sentiment Analysis | Also known as opinion mining, sentiment analysis is the process of using AI to analyze the tone and opinion of a given text. | Uchambuzi wa Hisia | Huu ni mchakato wa kutumia AU ili kuchanganua toni na maoni katika matini fulani. |
| Speech Recognition | The ability of a machine to identify words and phrases in spoken language and convert them into readable text. | Utambuzi wa Usemi | Hii ni mbinu ya kisayansi inayobuni mchakato wa kutambua sauti za maneno ya usemi na kuzibadili katika hali ya kusomeka. |
| Supervised Learning | Supervised learning is a type of machine learning in which classified output data is used to train the machine and produce the correct algorithms. It is much more common than unsupervised learning. | Mafunzo Yanayosimamiwa | Mafunzo yanayosimamiwa ni aina ya ujifunzaji kwa mashine ambapo matokeo ya data iliyoainishwa hutumiwa kufundisha mashine na kutoa kanuni sahihi. Ni ya kawaida zaidi kuliko ujifunzaji usiosimamiwa. |
| Support Vector Machines (SVM) | Supervised learning models used for classification and regression analysis. | Mashine ya Kimodeli | Mashine ya kilogarithimu yanayotoa deta inayoonyesha suluhu kwa changamoto mbalimbali za ujifunzaji kutokana na makundi tofautitofauiti |
| Support Vector Machine (SVM) Kernel | An algorithm used in SVM to transform data and find an optimal boundary between the possible outputs. | Mashine ya kimodeli ya Keneli | Haya ni mashine ya kilogarithimu ambayo hutumia mbinu angalizi ya ujifunzaji ili kutoa suluhu kwa changamoto ngumu na shida za awali ili kupeana deta na kuonyesha utofauti kwa misingi ya makundi ambayo hayajabainishwa |
| Swarm Intelligence | A type of artificial intelligence based on the collective behavior of decentralized, self-organized systems. | Akili pumba/ Sambazi | Akili ya kimfumo iliyotanda na yenye mashiko ya mawasiliano katika mazingira husika |
| Temporal Difference Learning | A method used in reinforcement learning to estimate the value of a policy by combining ideas from dynamic programming and Monte Carlo methods. | Mbinu ya ujifunzaji Tofauti ya Muda | Hii ni mbinu inayotumika kuleta pamoja jinsi tabia fulani ya muda hutokea au hubadili baada ya kuchochea akili ya mwanafunzi. |
| Token | A token is a basic unit of text that an LLM uses to understand and generate language. A token may be an entire word or parts of a word. | Kipashio msingi/tokeni | Kipashio msingi ni sehemu ya msingi ya maandishi ambayo Mashini ya ujifunzaji Lugha hutumia kuelewa na kuzalisha lugha. Ishara inaweza kuwa neno zima au sehemu za neno. |
| Topic Modeling | A type of statistical modeling used for discovering the abstract "topics" that occur in a collection of documents. | Ufunzaji wa Mada | Hii ni jinsi mada fulani itakavyofunzwa, matokeo maalum, shughuli za ujifunzaji na utaratibu wa kuifunza mada hiyo katika kipindi kusudiwa. |
| Training | The process of preparing a person in acquiring certain skills. | Maandalizi | Kuandaa mtu katika kupata ujuzi fulani |
| Transfer Learning | The method of using knowledge gained from solving one problem and applying it to a different but related problem. | Kuhamisha Mafunzo | Kuwezesha mtu mwingine kujifunza kwa kubadili mbinu na mikakati ya ujifunzaji. |
| Underfitting | Occurs when a machine learning model is too simple to capture the underlying structure of the data. | Ufaafu chini ya kiasi |  |
| Unsupervised Learning | A type of machine learning in which the model learns from unlabeled data and attempts to find patterns and relationships in the data. | Mafunzo Yasiyosimamiwa | Huu ni ujifunzaji usio na msukumo wa nje bali hutokana na ari ya ndani ya anayejifunza |
| Voice recognition | Voice recognition, also called speech recognition, is a method of human-computer interaction in which computers listen and interpret human dictation (speech) and produce written or spoken outputs. Examples include Apple’s Siri and Amazon’s Alexa, devices that enable hands-free requests and tasks. | Utambuzi wa Sauti | Utambuzi wa sauti, unaoitwa pia utambuzi wa usemi, ni njia ya mwingiliano wa kompyuta na binadamu ambapo kompyuta husikiliza na kufasiri msukumo wa binadamu (matamshi) na kutoa matokeo kimaandishi au ya kimatamshi. Mifano ni pamoja na Siri ya Apple na Alexa ya Amazon, vifaa vinavyowezesha maombi na kazi bila mguso. |
| Word Embeddings | A type of word representation that allows words to be represented as vectors in a continuous vector space. | Upachikaji wa Neno | Huu ni uwekaji wa maneno katika usemi ili kuleta maana iliyokusudiwa. |
| Word Frequency Analysis | The process of counting how often words appear in a text or corpus. | Uchambuzi wa Masafa ya Neno | Uchanganuzi wa ni mara ngapi neno limetumika katika matini au semi. |
| Word2Vec | A group of related models used to produce word embeddings. | Neno2Vek |  |