A model that allocates which mail folder an email should be sent to (work, friends, promotions, important), like Gmail's inbox tabs.

Source: https://www.sciencedirect.com/science/article/pii/S2405844018353404#bib2

As we receive more emails, it's essential to organise them in a way that makes sense. When an email company does this well, it improves our experience. Spam messages can cause various problems such as taking up space on email servers, slowing down our internet, using up computer power, and wasting our time.

Email filters provide different levels of configuration to make decisions based on predefined categories. These categories can involve regular expressions, keywords in the message body, or the email address, especially for messages from friends or family.

Advanced filters, such as anti-spam systems, utilise techniques like the naive Bayes classifier or natural language processing to categorise incoming emails. the email hosting company accomplishes this, it greatly benefits the user.

Major email providers have employed a combination of machine learning techniques, including neural networks. These providers go beyond simply checking for junk mail using pre-existing rules. They generate new regulations based on what they have learned while continuing their spam filtering operations.

Email services like Gmail, Yahoo Mail, and Outlook use neural networks to identify spam emails. These networks learn and create new rules based on what they've learned. This helps them get better at filtering out spam.

According to a research paper (link), to automatically filter and categorise emails, content-based filtering is often used. It involves using machine learning techniques like Naive Bayes classification, Support Vector Machine, and neural networks. This method looks at the words, how often they appear, and how they are distributed in the email content.

As claimed by the same study, support vector machines (SVM) is one of the most potent and efficient state-of-the-art classification techniques for tackling the email spam problem. This supervised learning model analyses data and identifies patterns for categorisation and exploring the relationship between variables of interest.

A model that helps decide what grade to award to an essay question. This can be used by a university professor who grades a lot of classes or essay competitions.

Source:
https://link.springer.com/article/10.1007/s10462-021-10068-2
https://core.ac.uk/download/pdf/289244534.pdf

Automated essay scoring (AES) systems have evolved over the years, incorporating natural language processing and regression-based techniques for improved accuracy. Factors such as relevance, idea development, coherence, and domain knowledge are considered when evaluating essays.

Semantic features are extracted using Word2Vec and GloVe libraries. In some systems, the model is directly trained with word embeddings to determine the score.

A proposed approach combines structural and semantic features to determine scores. Challenges include the need for domain-specific datasets, limitations in feature extraction libraries, and a lack of completeness assessment and feedback.

The primary goal of AES systems is to reduce human effort and improve consistency. Various machine learning models, such as linear regression, random forest regression, and support vector regression, could be used, with the random forest regression model showing better performance.

A model that provides assistive technology for doctors to provide their diagnosis. Remember, doctors ask questions, so the model will use the patients' answers to provide probable diagnoses for the doctor to weigh and make decisions.

Source:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8754556/
https://www.nature.com/articles/s41467-020-17419-7

AI plays a crucial role in assisting doctors with disease diagnosis by utilising advanced algorithms and a vast amount of data. By analysing complex biomarkers, imaging findings from aggregated clinical studies, and medical notes from millions of patients, AI aims to improve diagnostic accuracy. Machine learning models, such as random forest classifiers, logistic regression, fuzzy logic, gradient boosting machines, decision tree, K-nearest neighbours (KNN), and support vector machines (SVM), are commonly employed for disease diagnosis. Deep learning models, particularly Convolutional Neural Networks (CNN), are also frequently utilised in this context.

Despite the progress made in AI-assisted diagnosis, there are several challenges that researchers need to address. Limited data size, high dimensionality, efficient feature selection techniques, and model generalisation are some of the key obstacles that need to be overcome.

It is worth noting that existing diagnostic algorithms, such as Bayesian model-based approaches and Deep Learning, primarily rely on associative inference. They identify diseases based on the correlation between symptoms and medical history.

However, a study published in Nature has shown promising results with counterfactual algorithms, which outperformed Bayesian diagnosis in terms of diagnostic accuracy and causal explanations.