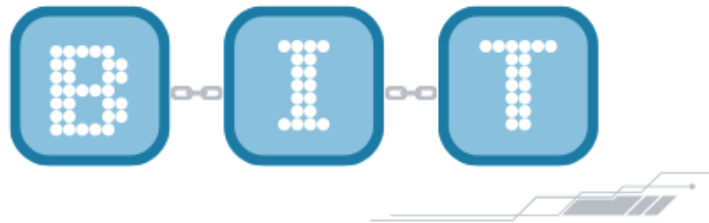


THE BITE OF



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BREAK DOWN

## What is The Bite of BIT

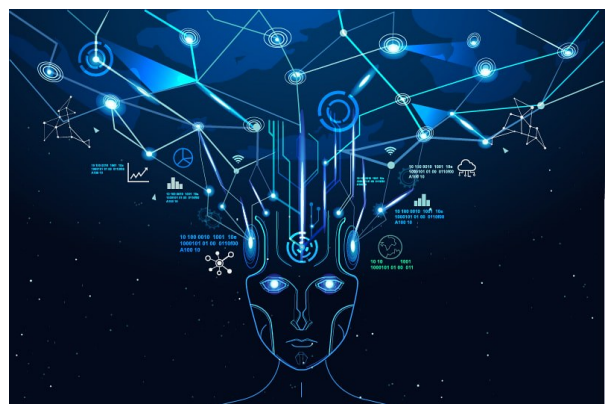
by [Kyra Gandhi](#) on November 6, 2023

Welcome to “The Bite of BIT”, BIT’s newsletter. Following each club session, we’ll deliver a comprehensive recap of our discussions. In our “New and Improved” segment, we’ll shine a spotlight on cutting-edge AI applications and their practical uses. Together we’ll explore the intersection between evolving technologies and our everyday world delving into their presence and futures in different fields. Whenever we host speakers, you can anticipate video uploads of their programs along with concise summaries of their insights. Additionally, we’ll provide links to valuable resources for our followers.

## Introduction to AI

by [Kyra Gandhi and Daniella Nuñez](#) on November 6, 2023

What is AI, or artificial intelligence? It's a technology field where humans enable computers to think independently. This is achieved through programs and systems capable of understanding, reasoning, and making decisions. Artificial



intelligence processes information, solves problems, and even evolves over time.

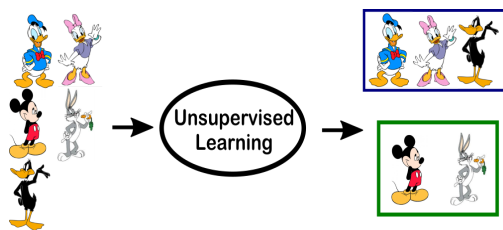
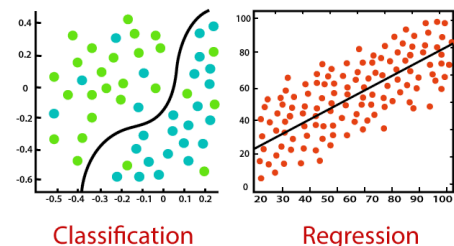
## Machine and Deep Learning

It operates using machine learning and deep learning (also known as neural networks). Machine learning allows systems to learn and improve through experience, without explicit programming. It employs algorithms and data to enable machines to mimic human cognitive functions and supports data collection and reprocessing. Deep learning involves interconnected layers of artificial neurons. Some machine-learning applications include robotics, drones, predictive tools (e.g., TikTok's 'For You' page, Netflix's recommendations, and weather forecasting), autonomous vehicles, and generation algorithms. Deep learning finds applications in computer vision (the machine process and analysis of visual data from images and videos), used in object tracking and autonomous navigation, and natural language processing (the computer interpretation of human language), as seen in chatbots like ChatGPT and Snapchat AI.

## Machine Learning Types

There are three fundamental types of machine learning: supervised, unsupervised, and reinforcement learning.

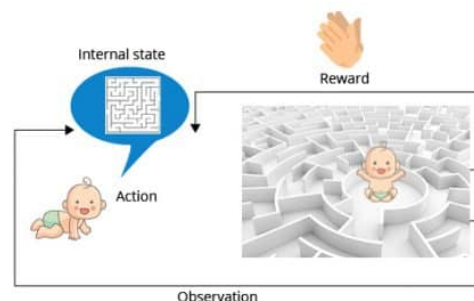
Supervised learning involves making **predictions or decisions** using **labeled training data**, comprising two primary categories: classification (for predicting categorical labels) and regression (for forecasting continuous numerical values). Its challenges revolve around the acquisition of high-quality labeled data, which can be time-consuming and expensive, potentially leading to overfitting on the training data, rather than learning general patterns.



Unsupervised learning identifies inherent **patterns or groupings** within **unlabeled training data**. It is useful for discovering interesting relationships or anomalies in large datasets and reducing dimensionality. Challenges in unsupervised learning include interpreting the significance of patterns, scaling, and efficiency. Notable examples include Netflix's grouping feature, which

suggests movies based on your viewing history, and DALL-E 2, a generative art application developed by OpenAI, the creators of ChatGPT.

Reinforcement learning involves an agent learning how to interact with an environment to achieve a goal through trial-and-error interactions. Think of a baby's learning process, which includes scenarios with a defined start and end state and various possible paths.



## Applications

AI has a variety of applications in different industries such as finance, agriculture, education, healthcare, entertainment & content creation, and image & video recognition

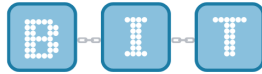
among many others. So how can we as high school students use it to our advantage? AI is a tool that should be used for elevating human potential and improving quality of life in a wide range of domains. For us it can be used to assist in career and college planning, studying, online tutoring (Quizlet & Khan Academy AI), and reading/information summarization (Readwise). When interacting with AI chatbots it is important to provide context and be clear and specific. For tasks like writing an email, it can be helpful to use language such as "from a professional high school student" or for whatever you want to come off as (friendly, advanced, smart), and "to a teacher" or to whomever your recipient is. The use of multitrn conversations can also serve to be extremely valuable, which is using language such as "You are a \_\_\_\_\_".

## New and Improved Pepper

by [Kyra Gandhi](#) on November 6, 2023

Pepper, often dubbed "the robot built for people," made its debut in Tokyo courtesy of SoftBank Robotics in June 2014. Sporting a humanoid form, Pepper possesses the remarkable ability to recognize and respond to human emotions. This interactive social robot boasts a diverse range of capabilities, from proposing games and taking photos to playing music and showcasing its dance moves. Pepper engages with people through both physical and vocal interactions and can engage in autonomous conversations. Its applications are as diverse as its talents. In several offices, Pepper fulfills the role of a receptionist, using facial recognition to identify visitors, sending meeting alerts, and even arranging beverages. Beyond the corporate world, it has found its place in banks, medical facilities, and select North American airports, offering warm greetings to travelers. In an unusual yet delightful twist, a team of Peppers took on the role of cheerleaders during a Japanese baseball game in July 2020. Not confined to public spaces, Pepper has found a home in numerous households, particularly in Japan, and serves as a valuable educational and research tool in schools, aiding in the teaching of programming and facilitating human-robot interaction studies. To top it all off, Tokyo, Japan, even boasts a Pepper Parlor Café, showcasing the robot's diverse range of capabilities.





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