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(57) Abstract :
An electromechanical data storage system that uses magnetic storage to store and retrieve digital data using one or more rigid, rapidly rotating platters is a hard disk drive (HDD), hard disk, hard drive or fixed disk. For modern HDDs, the two most popular form factors are 3.5-inch, for desktop computers, and 2.5-inch, mostly for notebooks. The good thing about them is that they are inexpensive compared to SSDs, but the bad thing is that because of power problems (power surges result in data loss when read/write heads malfunction), firmware corruption (cause disk to become unreadable), heat (disk expansion and contraction), unwanted vibrations (destroy the data stored in the disks) and many more, they are much more likely to fail. One of the commonly used methods to eliminate data corruption is to use the disks in a RAID configuration that, to some degree, solves the problem but limits the overall storage space. This inventionsuggest a machine learning model in this invention that uses SMART data from the drive and predicts a potential forthcoming failure that gives the user time to backup and save his/her data elsewhere. The dataset used for this model is the backblaze data for 2019 in which 2,068 out of 1,22,507 disk failures account for 1.89 percent of the annualized failure rate. Three models of machine learning were tested (namely XGB classifier, Logistic Regression and Random Forest Classifier). The final results of all three were compared and the highest precision of 98.66 percent was obtained by the XGB classifier. So, it is possible to build a more advanced version of this invention into a real application that data keeping organizations and even individuals can use to help protect their ' valuable data.

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