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These technologies adoption and expansion have been accelerated by the rapid advancement of processing power and the wealth of available data (Shinde & Shah 2018; Shrestha & Mahmood, 2019; Dargan et al., 2020). The ML and DL architectures, which are the foundation of these technologies, have made significant progress and shown remarkable capabilities in tasks such as natural language processing, autonomous systems, and image and audio recognition. ML models come in a variety of architectures, from basic linear regression models to intricate neural networks, designed for different tasks and types of data (Chauhan & Singh, 2018; Sengupta et al., 2020; Alzubaidi et al., 2021). DL, a branch of ML, utilizes neural networks with multiple layers to capture complex patterns and features in data (Minar & Naher, 2018; Dargan et al., 2020; Alzubaidi et al., 2021). Architectures such as Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Generative Adversarial Network (GANs) have expanded the capabilities of machines, resulting in advancements in computer vision, speech synthesis, and generative art. Fig. 1.1 shows the co-occurrence analysis of the trending keywords in ML. Table 1.1 shows the key architectural innovations and enhancements in ML and DL. Table 1.2 shows the key architectural innovations and enhancements in ML and DL.

**1.1 Artificial Intelligence**

Table 1.1 shows the key architectural innovations and enhancements in ML and DL.

**1.2 Machine Learning**

Table 1.1 shows the key architectural innovations and enhancements in ML and DL.

**2 Literature review**

Fig. 1.1 shows the co-occurrence analysis of the trending keywords in ML. Table 1.1 shows the key architectural innovations and enhancements in ML and DL. Ensure that all tables and figures are properly cited within the text.

**3 Methods and materials**

Fig. 1.1 shows the co-occurrence analysis of the trending keywords in ML. Table 1.1 shows the key architectural innovations and enhancements in ML and DL.

**4 Results and discussions**

Fig. 1.1 shows the co-occurrence analysis of the trending keywords in ML. Table 1.1 shows the key architectural innovations and enhancements in ML and DL.

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**Fig. 1.1** Page size



**Fig. 1.2** Page margin

**Table 1.1** Key architectural innovations and enhancements in ML and DL. Text within tables should be set in size 10.

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| **Sr. No.** | **References** | **Architectural Innovation** | **Description** | **Enhancements** | **Key Applications** |
| 1 | (Shrestha & Mahmood, 2019; Aziz et al., 2020; Deng, 2014) | Convolutional Neural Networks (CNNs) | A category of deep neural networks predominantly employed for scrutinizing visual stimuli. | Noteworthy advancements encompass. | Disciplines of interest encompass.  |
| 2 | (Alzubaidi et al., 2021; Janiesch et al., 2021; Wu & Xie, 2022) | Recurrent Neural Networks (RNNs) | Neural network architectures characterized  | Distinctive enhancements embrace proficient handling of sequential datasets. | Application domains. |

**Conclusions**

Transformer-based models such as BERT have caused a significant change in the field of NLP and consistently establish higher levels of performance. These models use self-attention mechanisms to better capture contextual information compared to traditional RNNs and CNNs.

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