



**Figure 5 Role of ML/ DL in IoT security.**

IoT devices and networks are growing rapidly worldwide and some of the researchers predict that the revenue generated due to smart IoT devices will reach 4 to 11 trillion dollars in 2025 [10]. The huge data traffic management and its security has become biggest concern worldwide. Although, a lot of research has been done in these areas, further research and validation is necessary to manage the ever-growing data traffic and emerging zero-day attacks. To meet this demand, intelligent techniques, resources, investment and research scientists are required in Qatar and every technologically advancing country.

### References:

- [1] Miorandi, Daniele, et al. "Internet of things: Vision, applications and research challenges." *Ad hoc networks* 10.7 (2012): 1497-1516.
- [2] Chase, J. (2013). *The evolution of the internet of things*. Texas Instruments, 1.
- [3] Asad, Mohammad & Memon, Zulfiqar & Syed, Tahir & Memon, Jamshed & Alshboul, Rabah. (2017). Addressing Future Data Management Challenges in IoT: A Proposed Framework. *International Journal of Advanced Computer Science and Applications*. 8. 10.14569/IJACSA.2017.080525.
- [4] J. Fu, Y. Liu, H. Chao, B. K. Bhargava and Z. Zhang, "Secure Data Storage and Searching for Industrial IoT by Integrating Fog Computing and Cloud Computing," in *IEEE Transactions on Industrial Informatics*, vol. 14, no. 10, pp. 4519-4528, Oct. 2018.
- [5] Dobre C, Xhafa F. Intelligent services for big data science. *Future Generation Computer Systems*. 2014 Jul 1;37:267-81.
- [6] Jabbar, Rateb, et al. "Applied Internet of Things IoT: Car monitoring system for Modeling of Road Safety and Traffic System in the State of Qatar." *Qatar Foundation Annual Research Conference Proceedings*. Vol. 2018. No. 3. Qatar: HBKU Press, 2018.
- [7] Daza, Vanesa & Pietro, Roberto & Klimek, Ivan & Signorini, Matteo. (2017). CONNECT: CONtextual NamE discovery for blockchain-based services in the IoT. 1-6. 10.1109/ICC.2017.7996641.
- [8] Al-Fuqaha, A., Guizani, M., Mohammadi, M., Aledhari, M., & Ayyash, M. (2015). Internet of things: A survey on enabling technologies, protocols, and applications. *IEEE communications surveys & tutorials*, 17(4), 2347-2376.
- [9] Al-Gradi, Mohammed Ali, Amr Mohamed, Abdulla Al-Ali, Xiaojiang Du, and Mohsen Guizani. "A survey of machine and deep learning methods for internet of things (IoT) security." *arXiv preprint arXiv:1807.11023* (2018).
- [10] IoT Revenue Projected to Reach \$3 Trillion by 2025, <https://www.ariasystems.com/blog/internet-things-3-trillion-market-2020/s>