# Task-2

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| S.No | Application Domain | Complex Problem Identified | Justification |
| 1 | Healthcare AI | Diagnosing rare diseases using AI models | Diagnosing rare diseases is challenging due to limited data availability and the high variance in symptoms across patients. AI models require extensive training on diverse datasets to ensure accuracy. Additionally, ethical concerns arise regarding patient data privacy and potential biases in the models, leading to incorrect or delayed diagnoses. Research indicates that while AI can improve diagnostic efficiency, ensuring fairness and generalizability remains a major challenge. |
| 2 | Smart Cities | Traffic congestion prediction and optimization | Urban traffic congestion is influenced by numerous dynamic factors, including real-time events, weather conditions, and human behaviour. Predicting and managing congestion requires integrating multiple data sources, such as IoT sensors, historical traffic patterns, and AI-based analytics. The complexity increases with the need for real-time decision-making, where delays in response can cause inefficiencies and accidents. Moreover, implementing smart traffic solutions involves significant infrastructure investments and cybersecurity risks. |
| 3 | Cybersecurity | Detecting sophisticated cyber threats using machine learning | Cybercriminals constantly develop advanced attack strategies, making it difficult for traditional security measures to keep up. Machine learning models help detect anomalies, but they are vulnerable to adversarial attacks where hackers manipulate data to evade detection. Additionally, balancing false positives and false negatives in threat detection remains a challenge, as overly aggressive models may flag benign activities. The evolving nature of cyber threats demands continuous updates and adaptability in AI-driven security solutions. |
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