

Components of Algorithmic Design

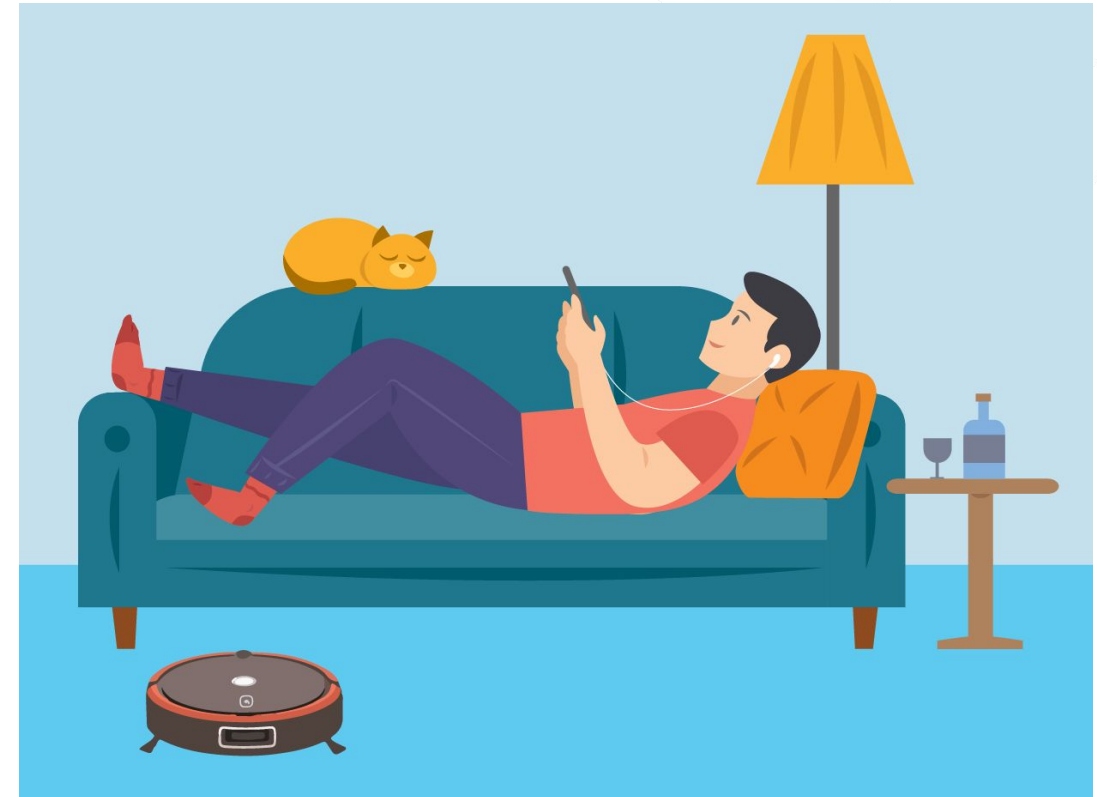


Alt text: Machine learning algorithm concept

Localisation and Mapping (SLAM)

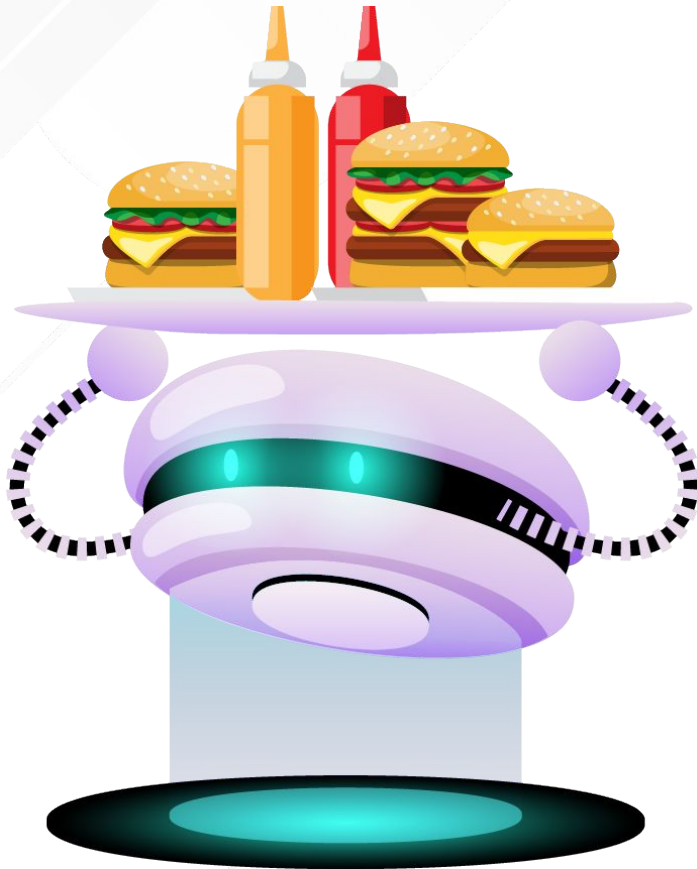
Autonomous systems like robotic vacuum cleaners need to navigate their environment efficiently.

SLAM algorithms help them create maps and localise their position in real-time. This enables the vacuum cleaner to clean the house without bumping into furniture or getting lost.



Alt text: Robotic vacuum cleaner

Path Planning and Navigation



Alt text: Autonomous delivery robot

Path planning algorithms ensure that the robot reaches its destination while avoiding obstacles and following predefined rules like avoiding human traffic.

For example, the autonomous delivery robots plan the best route in crowded environments.

Decision Making and Control

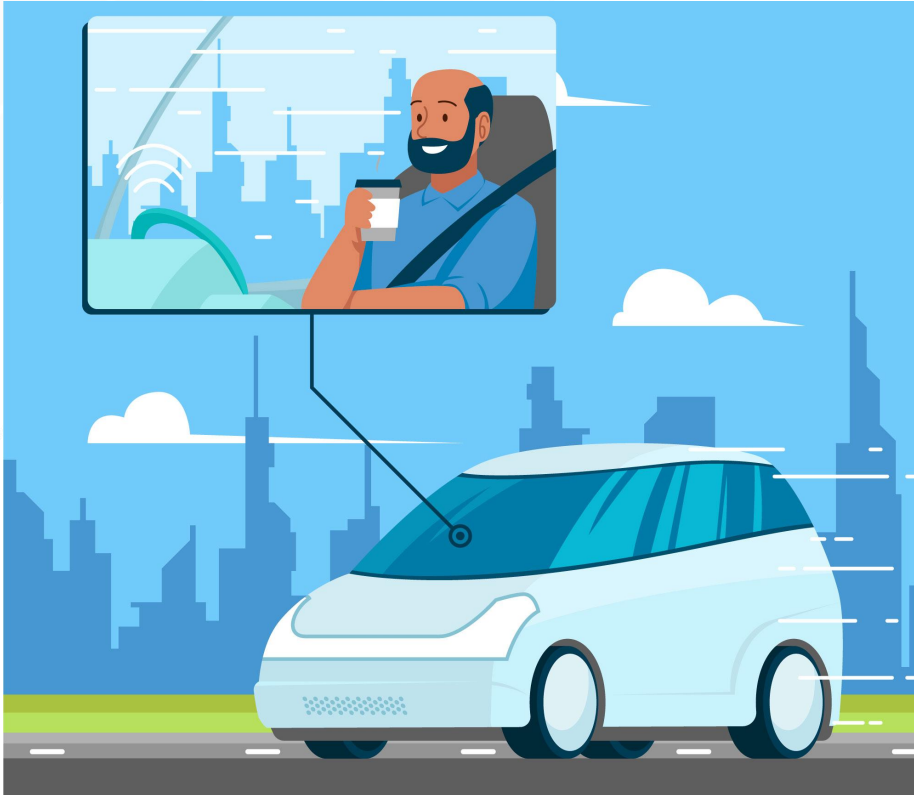
These algorithms allow systems to make choices based on the processed data.

For instance, an autonomous drone needs to decide whether to land, hover, or change direction depending on its environment and mission goals.



Alt text: Autonomous drone

Machine Learning and Adaptation



Alt text: Self driving car

Systems must continuously learn and adapt to their environments.

For instance, a self-driving car should improve its driving based on real-time traffic data, learning to avoid congested routes.