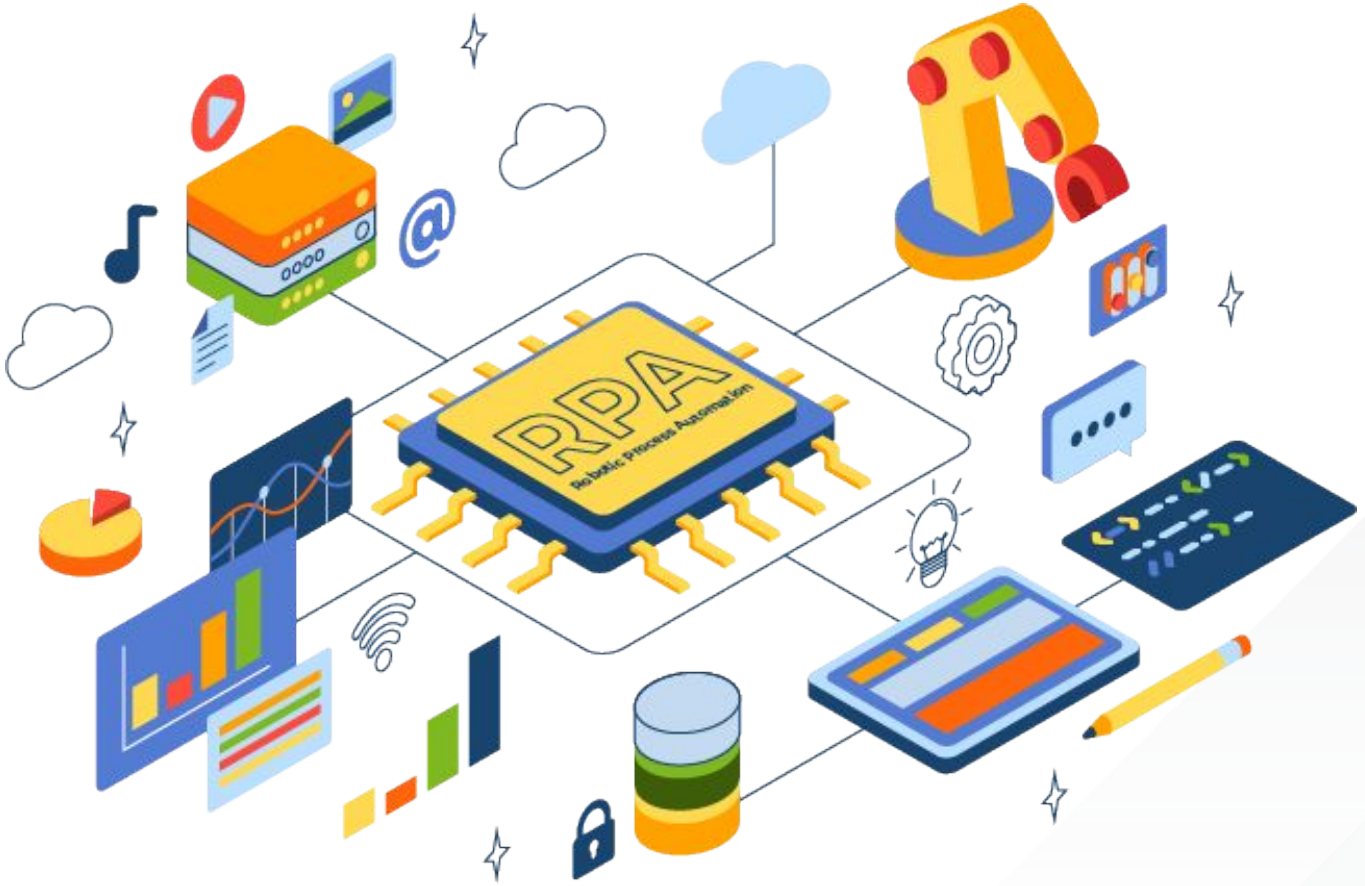
Challenges in Designing Core Algorithmic Models



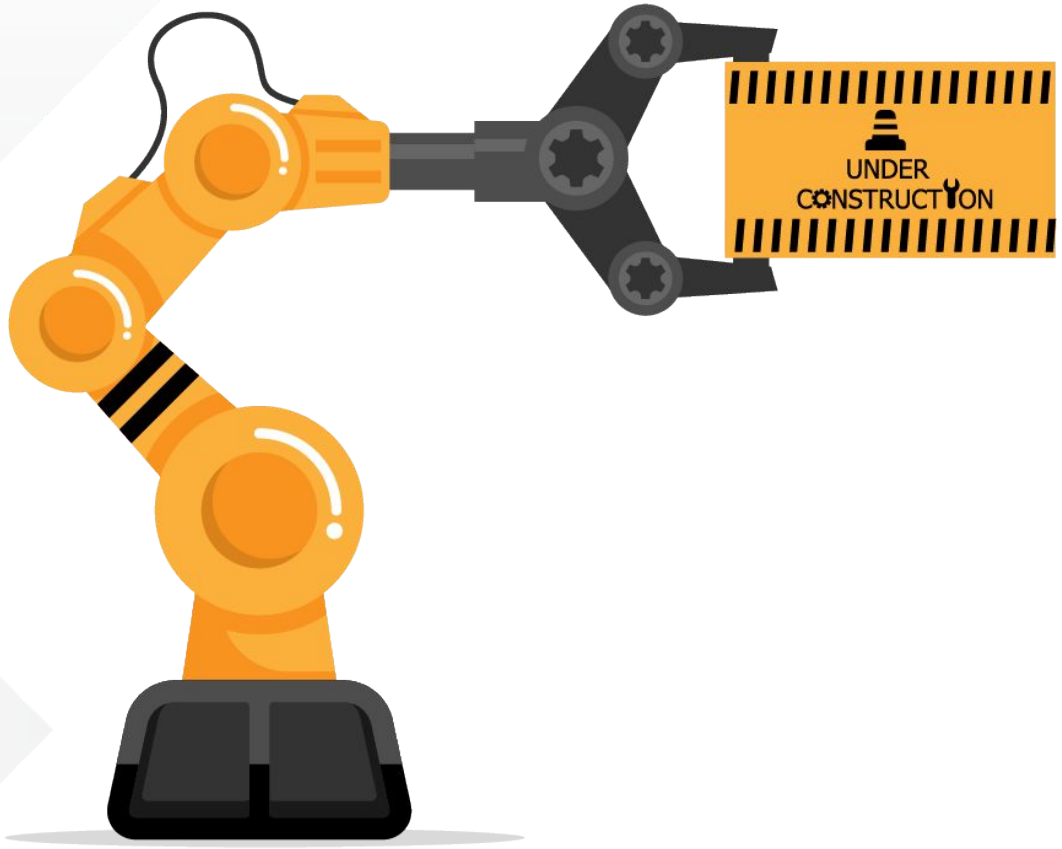
Alt text: *Robotic process automation illustration*

Uncertainty and Variability

In environments where sensor data may be **noisy** or incomplete (like heavy rain or fog for a self-driving car), designing robust algorithms is challenging but crucial.

Alt text: *Self drive car in rain*

Real-Time Performance



Alt text: *Robotic arm*

Algorithms must respond in real-time.

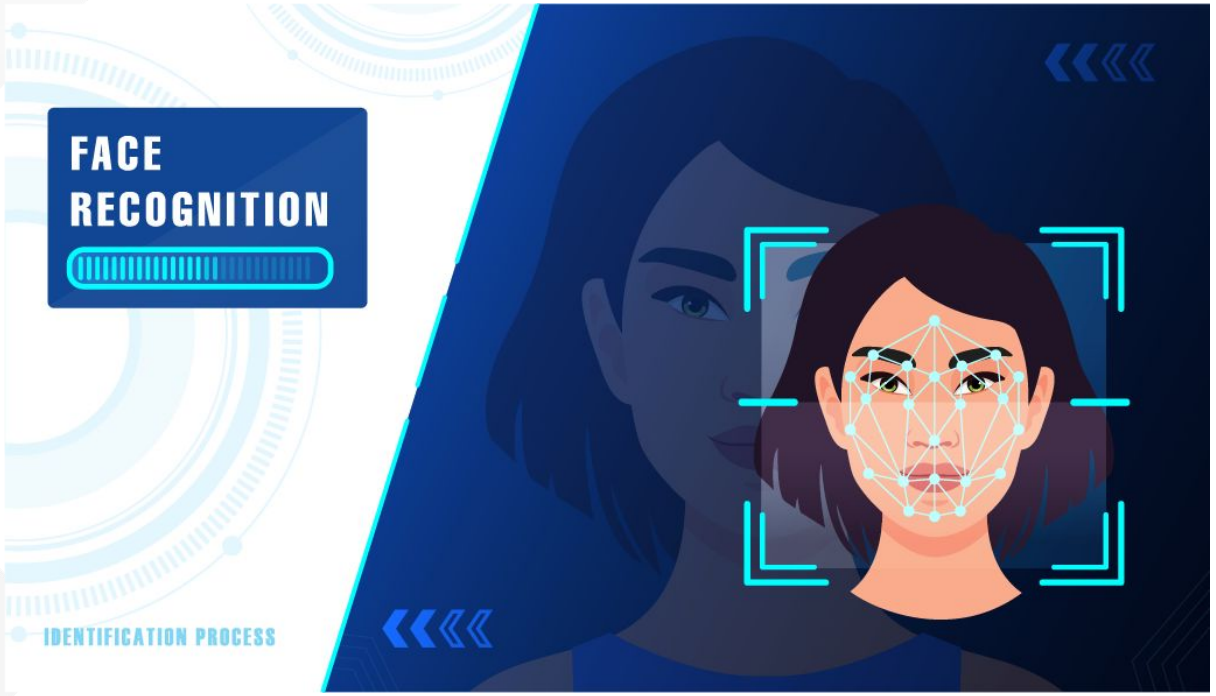
For example, an industrial robot arm must instantly adjust its movements to prevent errors during high-speed assembly.

Safety and Reliability

In critical systems, such as autonomous surgical robots, the algorithms must guarantee safe operations, as lives depend on them.

Alt text: *Robotic surgery*

Ethical and Legal Considerations



Alt text: *AI facial recognition*

Autonomous systems raise concerns such as privacy and fairness.

An AI facial recognition system must be designed ethically to avoid bias and ensure fair outcomes.