SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+'
Grade Approved by AICTE, New Delhi & Affiliated to Anna University,
Chennai

DEPARTMENT OF AEROSPACE ENGINEERING

19ASZ301– ROBOTICS & AUTOMATION IN SPACE

III YEAR VI SEM

UNIT 5 –ROBOTIC APPLICATIONS IN SPACE

TOPIC - ROBOTICS IN UNDERWATER OPERATIONS AND IN DEFENCE AND DISASTER MANAGEMENT

ROBOTICS IN UNDERWATER OPERATIONS

Need for Robotics in Underwater Missions:
- Human limitations at extreme depths
- Lack of light, high pressure, unpredictable terrains

Types of Underwater Robots:
- ROVs (Remotely Operated Vehicles): Tethered, surface-controlled
- AUVs (Autonomous Underwater Vehicles): Untethered, programmable

Applications:
- Ocean floor mapping
- Subsea pipeline inspection
- Marine biology & archaeology
- Deep-sea resource exploration
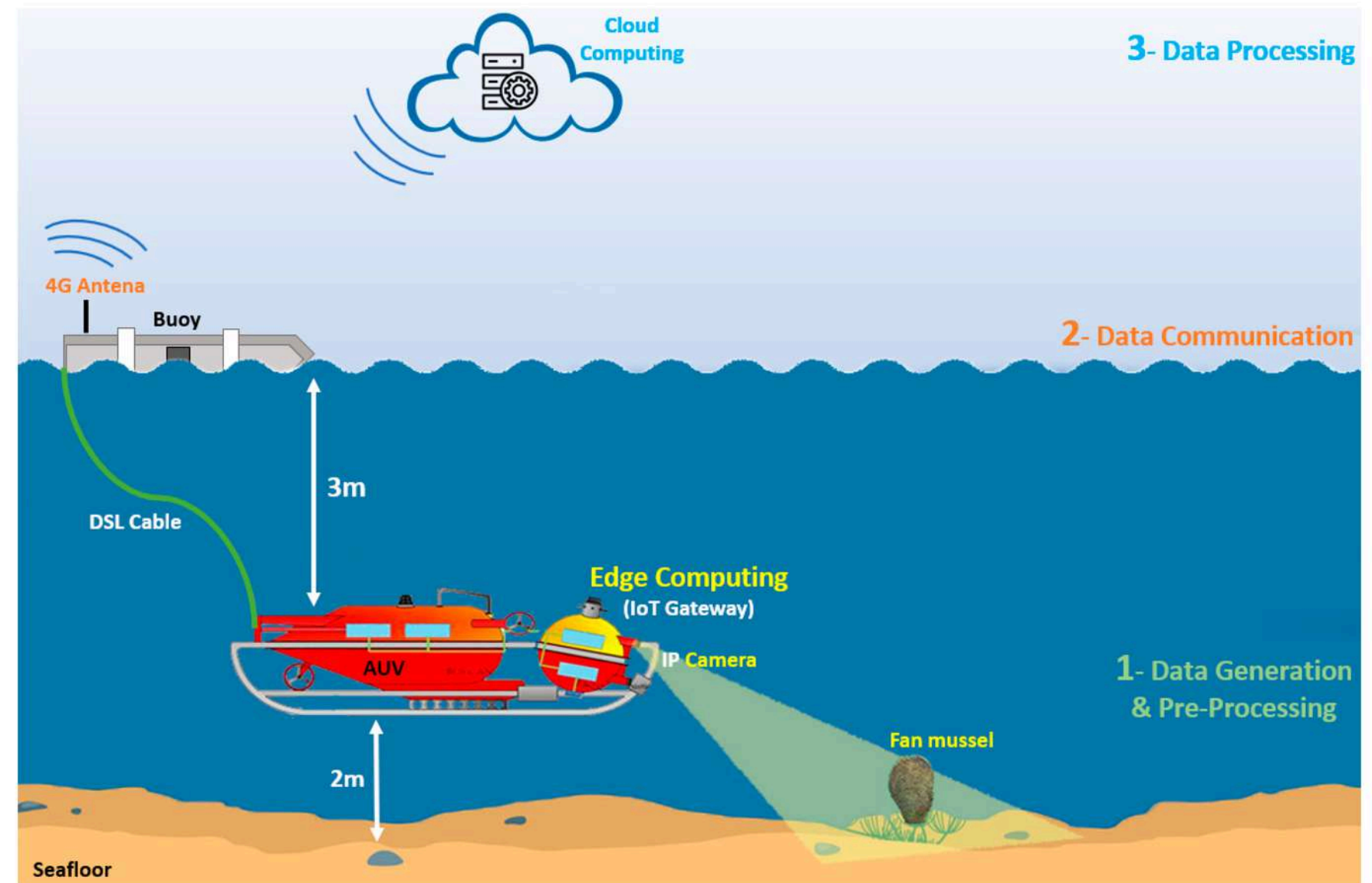
ROBOTICS IN DEFENCE OPERATIONS

Key Roles of Defence Robots:
- Operate in hazardous or enemy-controlled zones
- Support reconnaissance, bomb disposal, and logistics

Common Types:
- UGVs (Unmanned Ground Vehicles): E.g., bomb squads, surveillance
- UAVs (Unmanned Aerial Vehicles): Aerial reconnaissance & strikes
- Armed Robotic Systems: Remote-controlled weapon systems

Examples:
- India's Daksh: DRDO-developed UGV for bomb detection
- U.S. Talon Robot: Used in Iraq & Afghanistan for EOD (Explosive Ordnance Disposal)

ROBOTICS IN DISASTER MANAGEMENT

Role of Robots:
- Reach inaccessible or unsafe areas
- Locate survivors, assess damage, and deliver supplies

Types and Applications:
- Search & Rescue Drones: Locate victims using thermal cameras
- Snake-like Robots: Navigate through rubble
- Firefighting Robots: Enter high-temperature zones