PANIMALAR ENGINEERING COLLEGE

An Autonomous Institution

[JAISAKTHI EDUCATIONAL TRUST]

Approved by AICTE | Affiliated to Anna University | Recognized by UGC

All Eligible UG Programs are Accredited by NBA

Bangalore Trunk Road,Varadharajapuram, Poonamallee, Chennai- 600 123

TECHDIVATHON

Empower, Innovate, Elevate: Code the Future Together

Domain: MEDICAL ROBOTICS

Problem Statements:

S.No	Title	Problem Statement	Description
1	Precision Robotic Surgery Tools	Design robotic arms with enhanced dexterity and precision for minimally invasive surgical procedures.	Robotic arms offering unmatched precision for delicate surgeries, reducing human error and patient recovery times.
2	Wearable Exoskeletons for Rehabilitation	Develop lightweight robotic exoskeletons for physical rehabilitation after strokes or spinal cord injuries.	Robotic exoskeletons aiding mobility-impaired individuals with improved muscle support and recovery efficiency.
3	Autonomous Patient Transport Robots	Create robots that autonomously transport patients within hospitals, ensuring safety and reducing staff workload.	Smart robots navigate hospital corridors, reducing strain on staff while ensuring patient safety during transport.
4	Robotic Systems for Emergency Care	Build rugged, portable robotic units that provide first aid and monitor vitals in disaster zones or remote locations.	Mobile robotic units equipped to save lives in disaster areas by administering first aid and monitoring critical vitals.
5	Endoscopy Robot with Improved Navigation	Develop a robotic system for endoscopic procedures with enhanced navigation capabilities.	Advanced endoscopy robots deliver accurate diagnostics with minimal patient discomfort through precise navigation.
6	Robotic Prosthetics with Sensory Feedback	Design prosthetic limbs with integrated sensors for real-time feedback mimicking natural movement and touch.	Smart prosthetics enable amputees to regain a sense of touch and seamless movement through integrated feedback systems.
7	Micro-Robots for Targeted Drug Delivery	Create micro-scale robots capable of delivering medications to specific locations within the body.	Microscopic robots precisely deliver drugs to targeted areas, minimizing side effects and maximizing effectiveness.
8	Robotic Assistance for ICU Monitoring	Develop robotic assistants equipped with sensors and AI for real-time ICU patient monitoring.	Robotic aides monitor ICU patients continuously, providing real-time alerts for critical care interventions.

9	Robotic Triage Units	Design robots for emergency departments to quickly assess patient conditions.	Robots perform rapid triage in emergencies, supporting healthcare staff by prioritizing urgent cases efficiently.
10	Haptic Feedback Systems for Robotic Surgery	Build robotic surgical systems with advanced haptic feedback for surgeons.	Haptic-enabled robots improve surgical precision by providing tactile feedback, enhancing decision-making during procedures.
11	AI-Powered Robot Navigation in Healthcare	Develop navigation algorithms for medical robots in crowded hospital environments.	AI algorithms enable robots to navigate dynamic hospital corridors, avoiding obstacles and ensuring timely task execution.
12	Surgical Workflow Optimization Software	Create software to integrate with robotic surgery systems for workflow optimization.	Workflow software streamlines surgical processes by identifying bottlenecks and offering actionable insights for time efficiency.
13	Machine Learning for Prosthetics Adaptation	Build adaptive learning software that personalizes robotic prosthetic behavior.	Machine learning algorithms personalize robotic prosthetics, improving user comfort and functionality through continuous adaptation.
14	Patient Monitoring Robots with Predictive Analytics	Develop AI models for robots to predict patient deterioration.	Predictive analytics empower robots to foresee health deteriorations, enabling early interventions and reducing emergency risks.
15	Voice-Controlled Robots for Elderly Care	Design software enabling robots to respond to voice commands from elderly patients.	Voice-responsive robots provide personalized care for the elderly, assisting with daily tasks and fostering independence.
16	Real-Time Data Analysis for Surgical Robots	Create analytics software for robotic systems to provide surgeons with real-time data insights.	Real-time data tools enhance decision-making in surgeries by delivering actionable insights instantly to the surgeon.
17	Telemedicine Robot Interface	Develop intuitive interfaces for telepresence robots used in remote consultations.	User-friendly telepresence systems enhance doctor-patient interactions, making remote healthcare more accessible.
18	Autonomous Task Scheduling for Medical Robots	Build algorithms that allow robots to autonomously schedule tasks in hospitals.	Scheduling algorithms enable medical robots to handle multiple tasks efficiently without human intervention.
19	Robotic Diagnosis Assistant with NLP	Create software for robots to interact with patients using natural language processing (NLP).	NLP-driven diagnosis tools allow robots to analyze patient symptoms and suggest initial care steps, improving healthcare efficiency.
20	Data Encryption Software for Medical Robots	Develop secure encryption systems for protecting sensitive patient data.	Encryption solutions safeguard patient information, ensuring compliance with healthcare data privacy regulations.
21	AI-Driven Robotic Surgery Assistants	Combine robotics hardware with AI software to provide surgeons with decision-support tools.	Intelligent surgical robots assist in decision-making, combining precision hardware with AI insights for improved outcomes.

22	Robots for Post-Surgery Rehabilitation	Design robots integrating motion-capture hardware and AI-driven feedback systems.	AI-powered rehabilitation robots enable tailored recovery programs, improving patient engagement and results.
23	Telepresence Robots for Critical Care	Develop robotic mobility and software interfaces for remote ICU interactions.	Telepresence robots bridge specialists and ICU teams, providing mobility and secure interaction tools.
24	Robotic Systems for Personalized Medicine Delivery	Create robots equipped with medication handling hardware and AI for personalized treatment plans.	Personalized medicine robots improve adherence to treatment plans through precise medication handling and intelligent scheduling.
25	Mobile Robotic Units for Infection Control	Design robots with integrated disinfection hardware and AI-driven path planning.	Infection-control robots enhance hospital hygiene by autonomously disinfecting spaces using advanced path-planning algorithms.