

# SoftServe

## Physical AI for Oil & Gas Robotics Operations

Improve safety, efficiency, and operational intelligence across onshore, offshore, and subsea operations.



### ROBOTICS AS A SOLUTION



#### UNDERWATER & SUBSEA INSPECTIONS

Drones and crawlers perform inspections and data collection, with simulation-based mission planning and XR/VR training for safer, more efficient operations.



#### TOPSIDE & OFFSHORE OPERATIONS

Detect liquid and gas leaks, operate valves/actuators/controllers, monitor tank levels/equipment, and support emergency response, leveraging advanced simulations and models (with CFD and FEMA tools).



#### END-TO-END OPERATIONAL INTELLIGENCE

Robots feed digital twins and AI systems for predictive maintenance, process optimization, and fully autonomous workflows.



#### ADVANCED SENSOR INTEGRATION

AI-powered sensors provide real-time monitoring of anomalies and hazards, enhancing operational safety.



#### PREDICTIVE MAINTENANCE

Early issue detection minimizes downtime, extends equipment life, and reduces reliance on costly manual inspections.



#### COLLABORATIVE & MODULAR AUTOMATION

Humanoids, drones, and modular robots work safely with humans and can be redeployed for multiple tasks.

### VALUE WE DELIVER

1

**Autonomous Inspections:** Drones and crawlers inspect tanks, monitor systems, detect leaks and corrosion.

3

**Enhanced Visibility:** Sensor-equipped robots and digital twins provide real-time insights for safety and optimization.

2

**Predictive Maintenance:** AI-enabled robots detect anomalies early, reducing downtime and costs.

4

**Scalable Automation:** Modular autonomous systems, including drones and humanoids, are tested in simulations before deployment.

### BUSINESS IMPACT\*

Up to  
**30%**

faster inspections with drones, subsea robots and topside crawlers

Up to  
**25%**

lower operational costs by replacing helicopters, boats and manual work with robotics

Up to  
**20%**

improvement in overall schedule adherence through constraint-aware planning

\*All performance estimates are based on benchmark studies, pilot data, and industry-validated robotics use cases



## ROBOTICS & PHYSICAL AI CAPABILITIES IN OIL & GAS

### MOBILE ROBOTS & HUMANOIDS

Autonomous drones, crawlers, and humanoids perform inspections, valve operations, pipeline monitoring, and emergency response offshore and onshore.

### AUTONOMOUS VEHICLES & NAVIGATION

Surface, subsea, and aerial robots use 3D mapping, obstacle avoidance, and motion planning to enable inspections, predictive maintenance, and monitoring.

### SMART FACILITIES & INTELLIGENT WORKSPACES

AI, robotics, and digital twins enable autonomous monitoring, optimize asset and energy performance, improve safety and operations in facilities.

### AI-DRIVEN PERCEPTION & SENSOR FUSION

Multi-sensor fusion (gas imaging, infrared, LiDAR, radar) with AI and vision enables precise leak detection, corrosion monitoring, and anomaly detection.

### HIGH FIDELITY SIMULATIONS & DIGITAL TWINS

High-fidelity simulations and digital twins model platforms and pipelines to test inspections and emergency scenarios, reducing operational risks.

### INDUSTRIAL ROBOTICS & HUMAN-ROBOT OPS

Humanoids, legged robots, and robotic arms assist with maintenance, emergency response, and repetitive inspections, improving safety in hazardous areas.

### ROBOTIC OPERATIONS & FLEET INTEGRATION

Connected robots across onshore, offshore, and subsea sites enable coordinated inspections and monitoring with cloud fleet management for efficiency.

### EDGE AI & REAL-TIME DECISION MAKING

Onboard Edge AI enables autonomous intervention and real-time decisions in high-risk or low-connectivity environments, ensuring safe operations.



### MATERIALS & RESOURCES



VIDEO



Physical AI-driven Robotics Inspection for Oil & Gas Facilities

WHITE PAPER



Physical AI-driven Robotics Inspection for Oil & Gas Facilities

## ABOUT SOFTSERVE

SoftServe is a premier IT consulting and digital services provider. We expand the horizon of new technologies to solve today's complex business challenges and achieve meaningful outcomes for our clients.

Visit SoftServe's website ([softserveinc.com](https://softserveinc.com)) for more information.

**Ready to bring robotics & advanced automation to oil & gas operations?**



Physical AI Service Page



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