softserve

OIL & GAS ROBOTICS & ADVANCED AUTOMATION

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

SoftServe powers the next era of oil and gas automation, where intelligent robotics and physical AI transform high-risk, high-cost onshore and offshore operations into smart, autonomous, and resilient systems.

The Urgency of Intelligent Automation

- **High Operating Costs:** With rising operational expenses tightening break-even margins, greater automation has become essential for maintaining cost efficiency.
- **Workforce & Safety Risks**: Offshore production platforms, pipelines, and downstream facilities expose workers to hazards. Manual inspections increase accidents and can result in downtime.
- **Limited Operational Intelligence**: Disconnected systems and slow data collection hinder predictive maintenance, leak detection, and emergency response.
- **Aging Infrastructure**: Legacy assets are costly to maintain and prone to failures without continuous monitoring and predictive maintenance.
- **Operational Complexity:** Highly intricate topside and subsea environments require digital twins to simulate missions before execution.

Value we Deliver

Autonomous Inspections: Drones and robotic crawlers perform high-risk tank level inspections, systems control, leak and corrosion detection.

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

Scalable Automation: Modular, fully autonomous systems – including drones and humanoids – tested and optimized in realistic simulations before real-world deployment, reducing risk and costs.

Enhanced Visibility: Sensor-equipped robots and digital twins provide real-time insights for safety, process optimization, and emergency response.

Business Impact*

Up to **30%** faster inspections with drones, subsea robots, and topside crawlers.

Up to **30%** lower operational costs by replacing helicopters, boats, and manual work with robotics.

Up to **25%** less manual labor for inspections, monitoring, and emergency tasks.

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 as the 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).

Predictive Maintenance:

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

Advanced Sensor Integration:

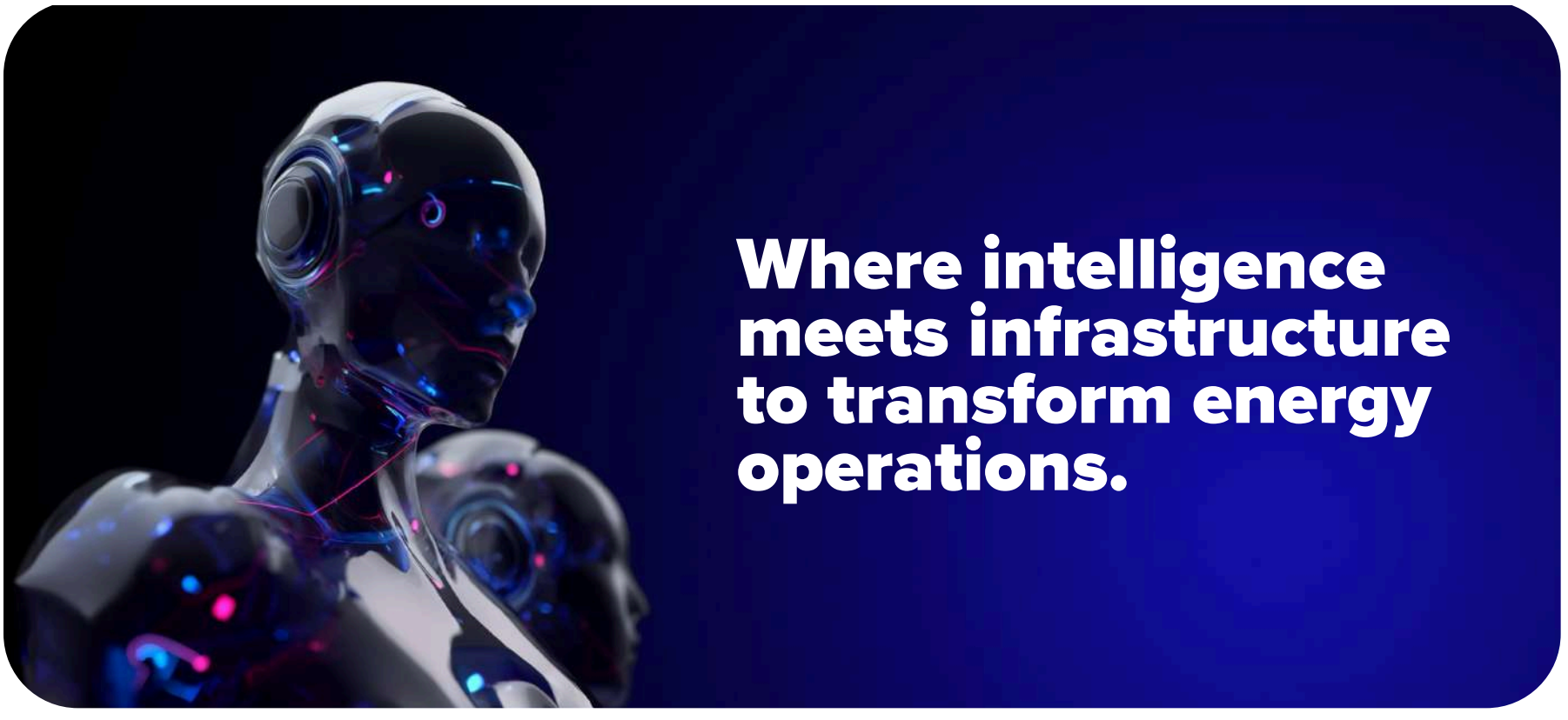
AI-powered sensors provide real-time monitoring of anomalies and hazards, enhancing operational safety.

Collaborative & Modular Automation:

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

End-to-End Operational Intelligence:

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



Robotics & Physical AI Capabilities in Oil & Gas

Mobile Robots & Humanoids

Autonomous drones, crawlers, and humanoids perform high-risk inspections, valve operations, pipeline monitoring, and emergency response across offshore platforms, subsea pipelines, and onshore facilities.

Edge AI & Real-Time Decision Making

Onboard AI enables autonomous intervention and real-time decision-making in high-risk or communication-limited environments, ensuring safe, reliable, and resilient operations.

Smart Facilities & Intelligent Workspaces

Integrate AI, robotics, and digital twins to enable autonomous monitoring, optimize energy and asset performance, and enhance safety and operational efficiency across refineries, terminals, and offshore sites.

AI-Driven Perception & Sensor Fusion

Multi-sensor fusion (optical gas imaging, infrared, LiDAR, radar, thermal) combined with AI and computer vision allows precise leak detection, corrosion monitoring, and anomaly identification, even in complex offshore and subsea environments.

High Fidelity Simulations & Digital Twins

High-fidelity simulations and digital twins model platforms, pipelines, and subsea assets to test inspections and emergency scenarios using synthetic datasets to minimize operational risks before deployment.

Industrial Robotics & Human-Robot Collaboration

Humanoids, legged robots, and robotic arms assist humans in maintenance, emergency interventions, and repetitive inspections, increasing safety and efficiency in hazardous or hard-to-access areas.

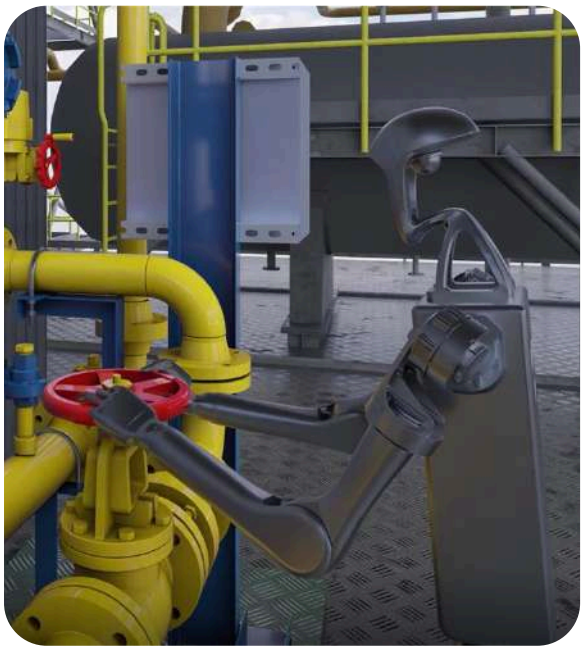
Robotic Operations & Fleet Integration

Connect heterogeneous robots across onshore, offshore, and subsea sites for coordinated inspections, predictive maintenance, and continuous monitoring. Cloud-based fleet management optimizes efficiency and reduces manual intervention.

Autonomous Vehicles & Navigation

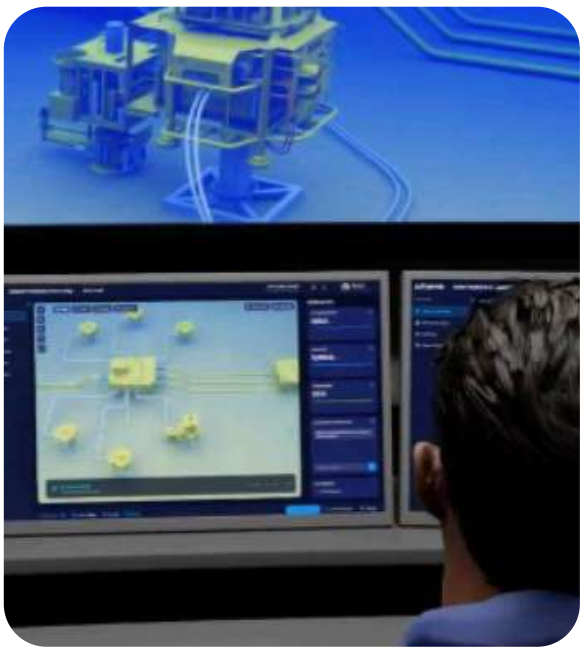
Surface, subsea, and aerial robots enhance inspections, maintenance, and logistics with 3D mapping, obstacle avoidance, and advanced motion planning. They enable predictive maintenance, leak detection, and remote monitoring, reducing operational delays and downtime.

Selected Use Cases



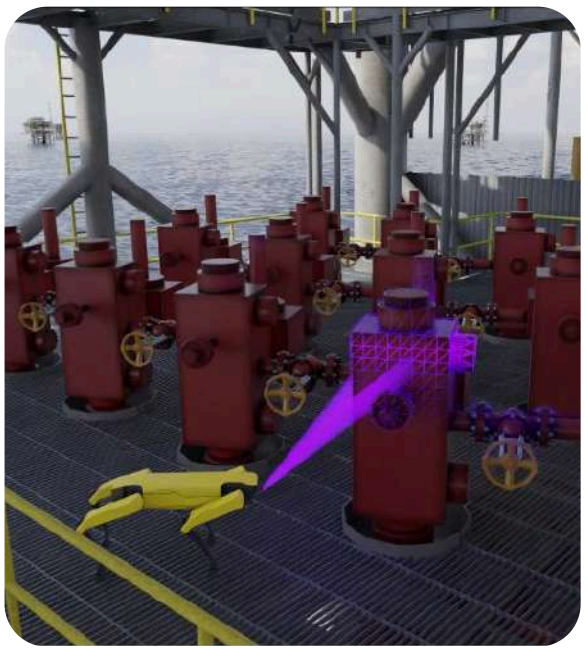
Wellhead Simulation for Autonomous Inspection

Spot, H1, and UAVs autonomously navigate platforms, operate valves, and respond to gas leaks, mitigating hazards, reducing downtime, and enhancing safety.



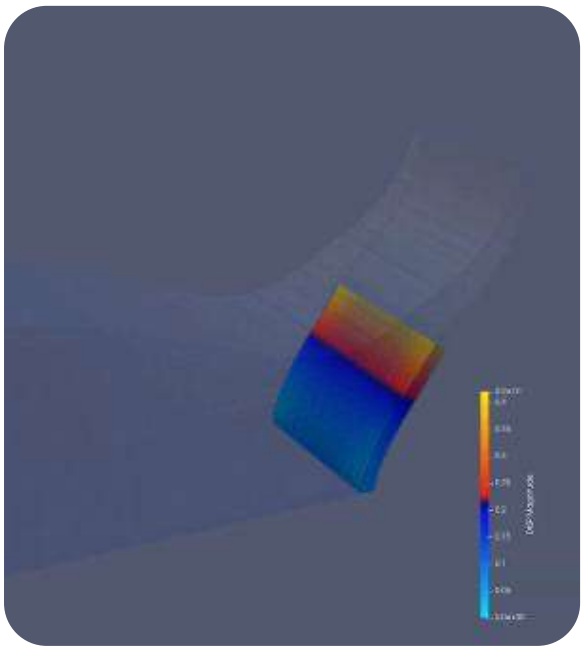
Digital Twin for Autonomous Subsea Operations

A cloud-native platform unifying subsea asset data and AI insights to automate engineering, enable predictive leak detection, and support autonomous robotics and mission planning.



Facility Inspection Optimization with Spot

High-fidelity simulations enable Spot to inspect multi-story facilities, automating data collection, lowering operational costs, and improving accuracy.

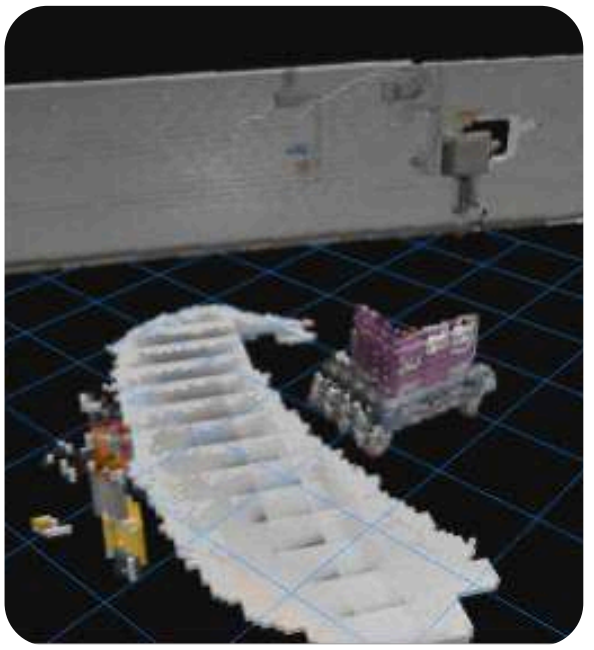


Fluid-Structure Simulation for Risk Prediction

Simulations predict pipeline and platform responses to fluid and structural stresses, enhancing maintenance planning and minimizing operational risks.

Digital Twin for Unmanned Underwater Vehicle (UUV)

A digital twin simulates UUV operations, battery usage, and fluid dynamics, accelerating deployment and optimizing performance while reducing field testing risks.



3D Mapping Validation

Controlled outdoor environments allow UAVs to map complex facilities accurately, streamlining inspection planning and providing actionable site intelligence.

Why SoftServe

32 Years
of Award-winning service across multiple industries

30%
of the team are Sc.D. & Ph.D. holders in robotics & advanced automation

100+
Successful automation projects across more than 10 industries worldwide

30%
Project delivery acceleration with a simulation-first approach

Strategic Alliances

NVIDIA Elite Partner

Google Cloud Service Premier Partner

aws Partner Premier Tier Services

Microsoft Solutions Partner

Proud to Collaborate

NASA

BruhnBruhn Innovation

Algoryx

Astroport Space Technologies

Prefixa

ISTVS istvs.org since 1962

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. Our boundless curiosity drives us to explore and reimagine the art of the possible. Clients confidently rely on SoftServe to architect and execute mature and innovative capabilities, such as digital engineering, data and analytics, cloud, AI/ML, robotics, automation and physical AI.

Our global reputation is gained from more than 30 years of experience delivering superior digital solutions at exceptional speed by top-tier engineering talent to enterprise industries, including high tech, financial services, healthcare, life sciences, retail, energy, and manufacturing.

Visit our **website**, **blog**, **LinkedIn**, **Facebook**, and X (**Twitter**) pages for more information.

Ready to Bring Robotics & Advanced Automation to Your Space Mission?

CONTACT US | ROBOTICS SERVICE PAGE | INDUSTRY PAGE

Austin HQ

201 W 5th Street, Suite 1550
Austin, TX 78701 USA
+1 866 687 3588 (USA)
+1 647 948 7638 (Canada)

London

30 Cannon Street
London EC4 6XH
United Kingdom
+44 333 006 4341

softserve