Motion Planning Algorithm Performance Analysis

(a) Success Rates Across Different Scenarios

Legend:
- Static Obstacles
- Dynamic Environment
- Dense Foliage
- Wind Disturbance

X-axis: Motion Planning Algorithms (DDPG, A3C, PPO, SAC, RRT*, PRM, Dijkstra, Hybrid-RL)
Y-axis: Success Rate (%)

(b) Processing Time vs Adaptability Tradeoff

- High Adaptability Fast Processing
- High Adaptability Slow Processing

Labels: SAC, PPO, A3C, Hybrid-RL, RRT*, PRM, Dijkstra

Legend:
- RL Algorithms
- Traditional Algorithms
- Circle: DDPG/RRT*
- Square: A3C/PRM
- Triangle: PPO/Dijkstra

X-axis: Processing Time (ms)
Y-axis: Adaptability Score

(c) Learning Convergence Speed (RL Algorithms)

Algorithm	Epochs to 90% Performance
DDPG	850
A3C	1200
PPO	950
SAC	780
Hybrid-RL	920

X-axis: Reinforcement Learning Algorithms
Y-axis: Epochs to 90% Performance

(d) Performance Heatmap Across Scenarios

Scenario	DDPG	A3C	PPO	SAC	RRT*	PRM	Dijkstra	Hybrid-RL
Static Obstacles	92.3%	88.7%	90.1%	91.8%	85.4%	82.1%	78.9%	89.5%
Dynamic Environment	87.6%	85.2%	88.9%	89.3%	71.2%	68.7%	65.1%	86.8%
Dense Foliage	82.1%	79.8%	84.3%	85.7%	68.9%	65.2%	61.4%	83.2%
Wind Disturbance	78.9%	76.3%	81.2%	83.1%	72.5%	69.8%	66.7%	80.4%

Color scale: Success Rate (%) from 60 (red) to 95 (green)