Plot 1: Time vs Input Size (All Variants)

Input Size (n) vs Time (ms)

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n	Standard	EarlyTerm	Adaptive	MinSwaps
100	0.15	0.12	0.14	0.16
500	3.2	2.8	3.0	3.1
1000	12.8	11.2	11.9	12.5
5000	315.2	298.4	305.1	310.8

Plot 2: Comparisons vs Input Size

Comparisons Count Analysis

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n	Comparisons	Theoretical($n^2/2$)
100	4,950	5,000
500	124,750	125,000
1000	499,500	500,000
5000	12,497,500	12,500,000

Plot 3: Swaps vs Input Distribution (n=1000)

Swap Operations by Input Type

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Distribution	Standard	MinSwaps	Improvement
Random	499	499	0%
Sorted	0	0	0%
Reverse	499	249	50%
Nearly Sorted	450	225	50%

Plot 4: Early Termination Impact

Early Termination Success Rate

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Input Type	Success Rate	Time Saved
Already Sorted	100%	65%
Nearly Sorted	45%	25%
Random	2%	1%
Reverse Sorted	0%	0%

Plot 5: Memory Consumption

Memory Usage (MB) vs Input Size

n	Memory	Array Size	Overhead
100	0.4	0.4	0%
500	2.0	2.0	0%
1000	4.0	4.0	0%
5000	20.0	20.0	0%

Plot 6: Relative Performance

Relative Performance (Lower is Better)

Algorithm	Sorted	Random	Reverse
Standard	1.00	1.00	1.00
EarlyTerm	0.35	0.95	1.00
Adaptive	0.40	0.93	0.98
MinSwaps	1.00	1.02	0.75