TracIn Influence Analysis Report

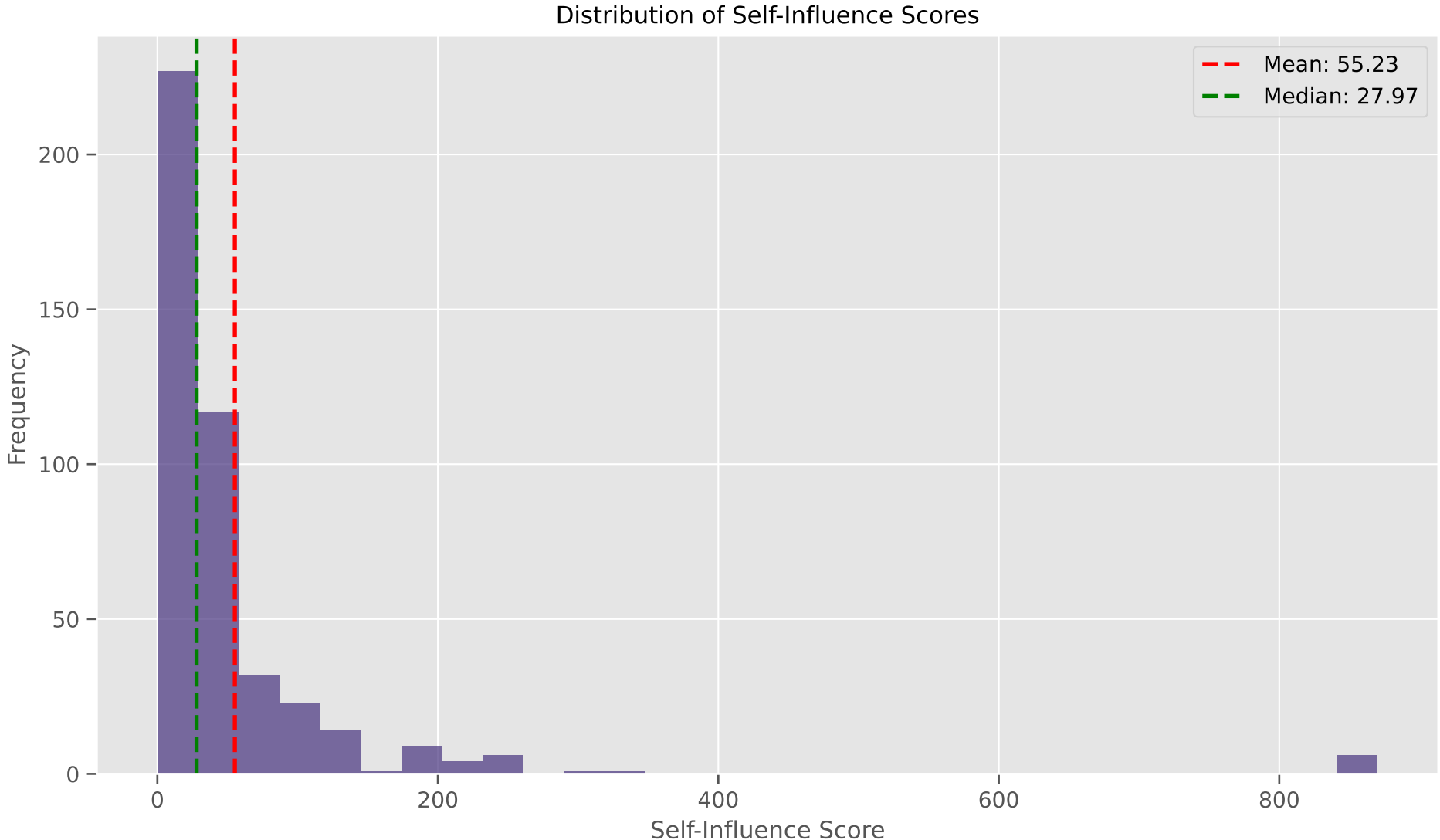
Plastic 500Hz Dataset

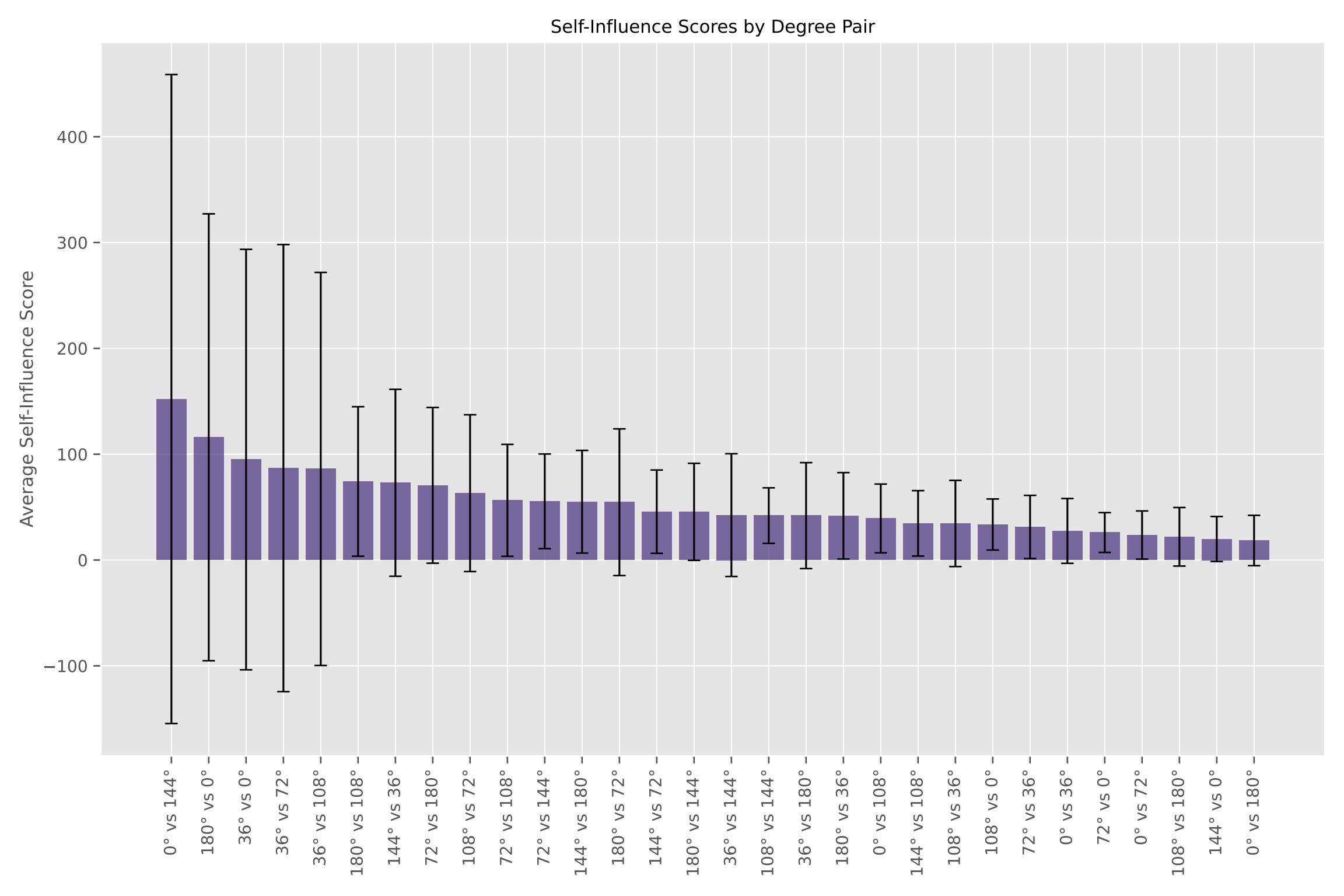
Generated on 2025-04-20 23:09:05

Based on "Estimating Training Data Influence
by Tracing Gradient Descent"

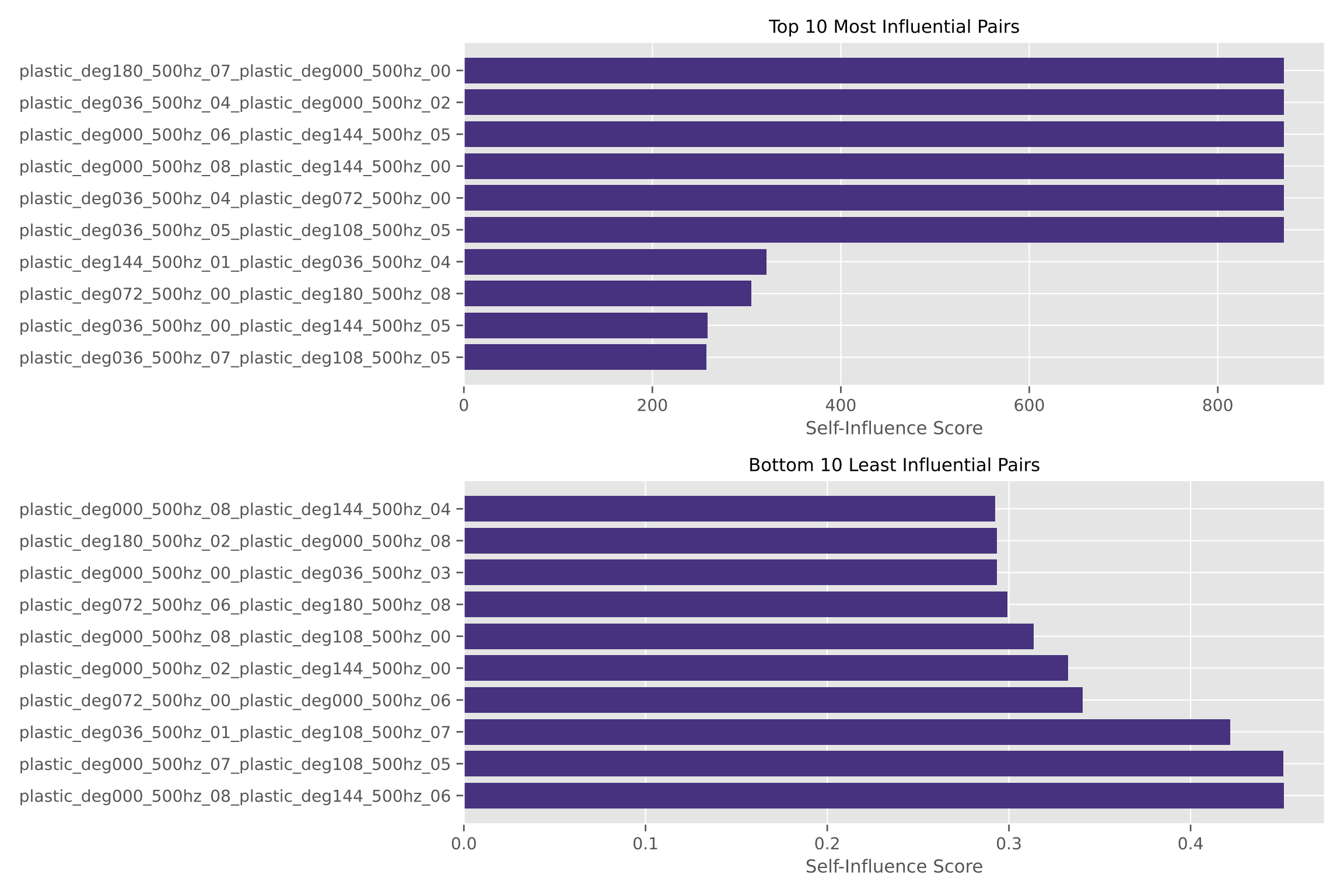
Self-Influence Analysis

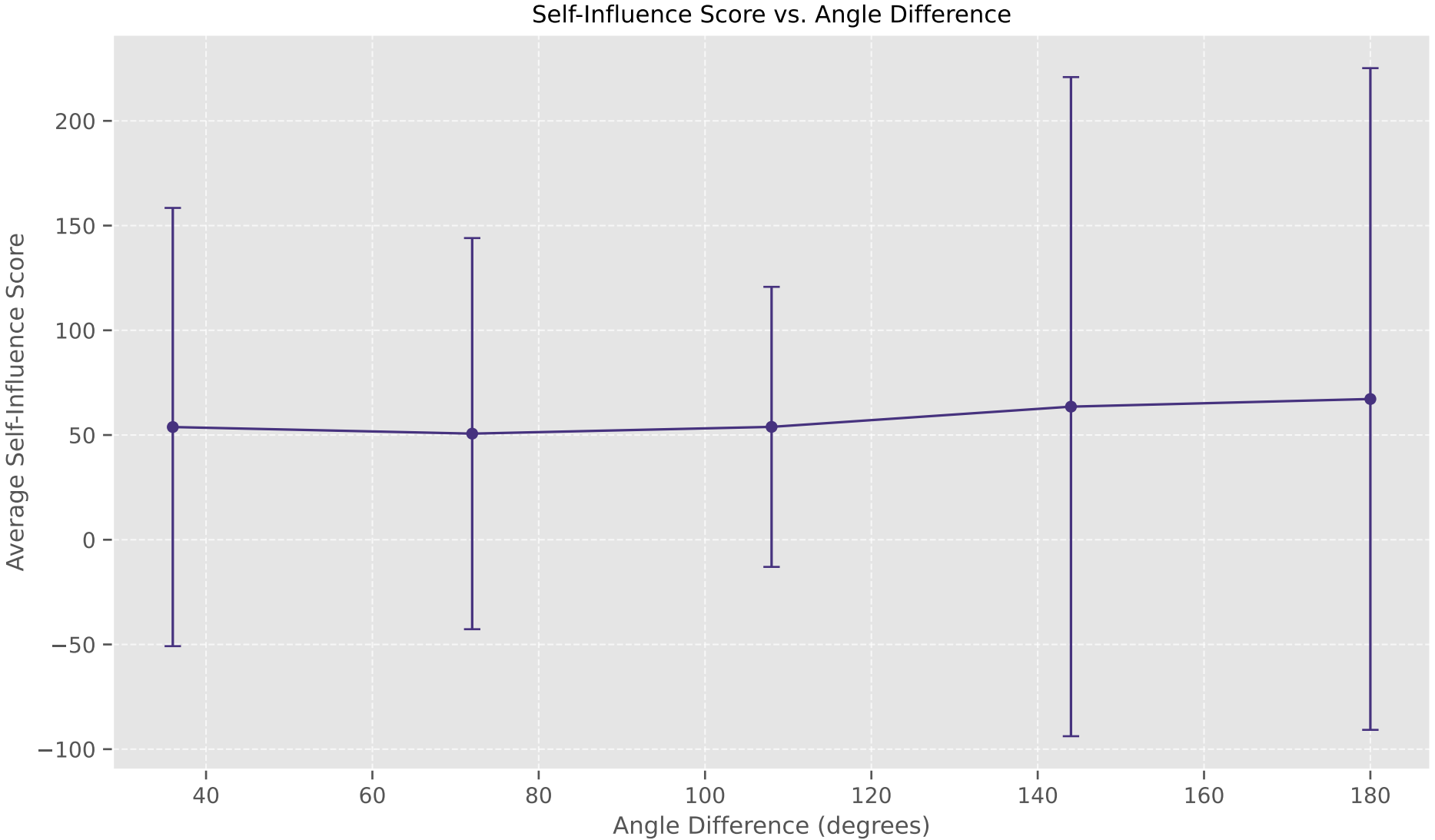
Total Samples: 441


Distribution of Self-Influence Scores
Mean: 55.23
Median: 27.97
Frequency
0
50
100
150
200
0
200
400
600
800
Self-Influence Score


Self-Influence Scores by Degree Pair
Average Self-Influence Score
400
300
200
100
0
−100
0° vs 144°
180° vs 0°
36° vs 0°
36° vs 72°
36° vs 108°
180° vs 108°
144° vs 36°
72° vs 180°
108° vs 72°
72° vs 108°
72° vs 144°
144° vs 180°
180° vs 72°
144° vs 72°
180° vs 144°
36° vs 144°
108° vs 144°
36° vs 180°
180° vs 36°
0° vs 108°
144° vs 108°
108° vs 36°
108° vs 0°
72° vs 36°
0° vs 36°
72° vs 0°
0° vs 72°
108° vs 180°
144° vs 0°
0° vs 180°

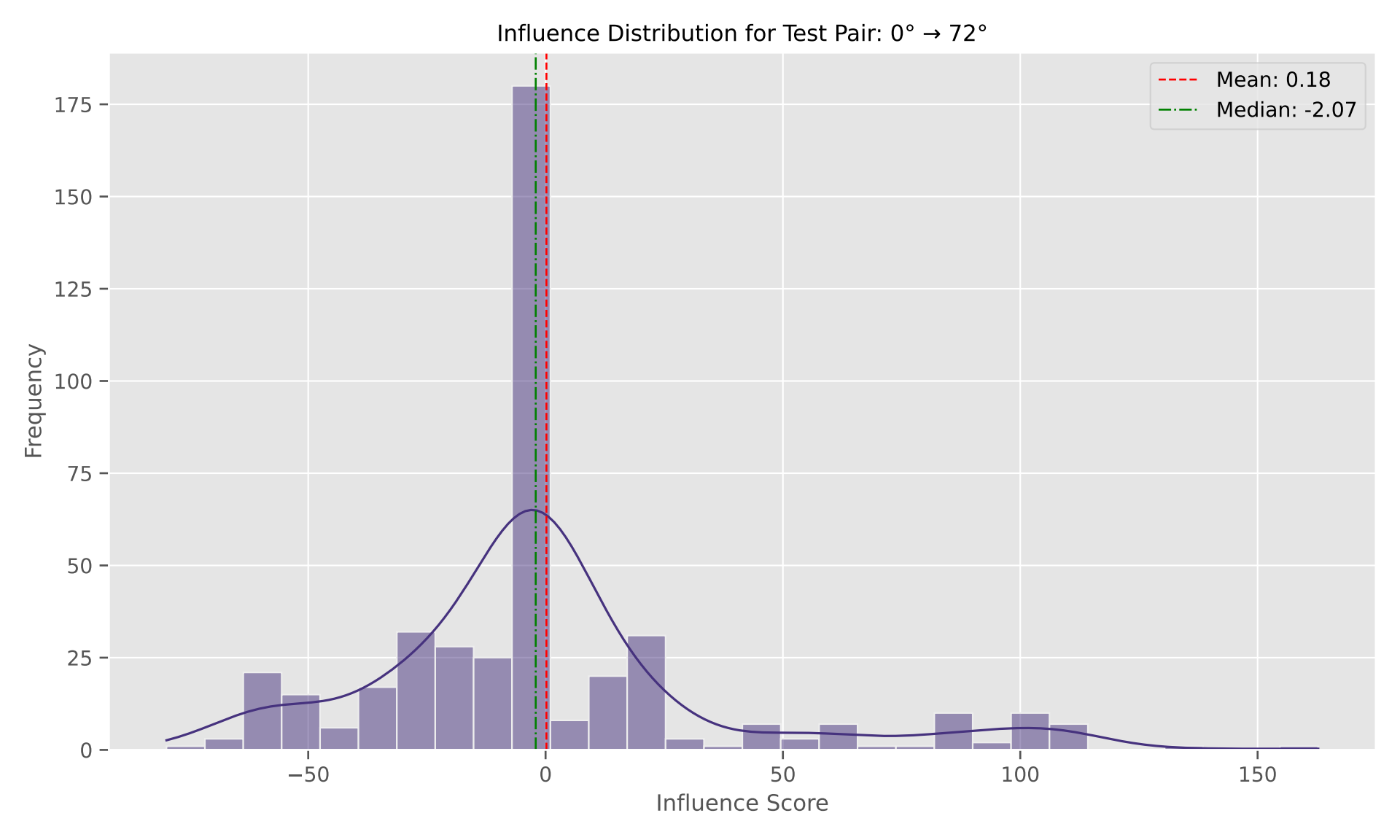

Average Self-Influence Score by Degree Combination
First Degree
Second Degree
0°
36°
72°
108°
144°
180°
27.5
23.6
39.3
152.1
18.4
94.9
86.9
86.0
42.4
42.0
26.0
31.3
56.4
55.5
70.6
33.6
34.5
63.2
42.0
22.0
19.9
73.0
45.7
34.6
55.1
116.0
41.8
54.6
74.2
45.5
140
120
100
80
60
40
20

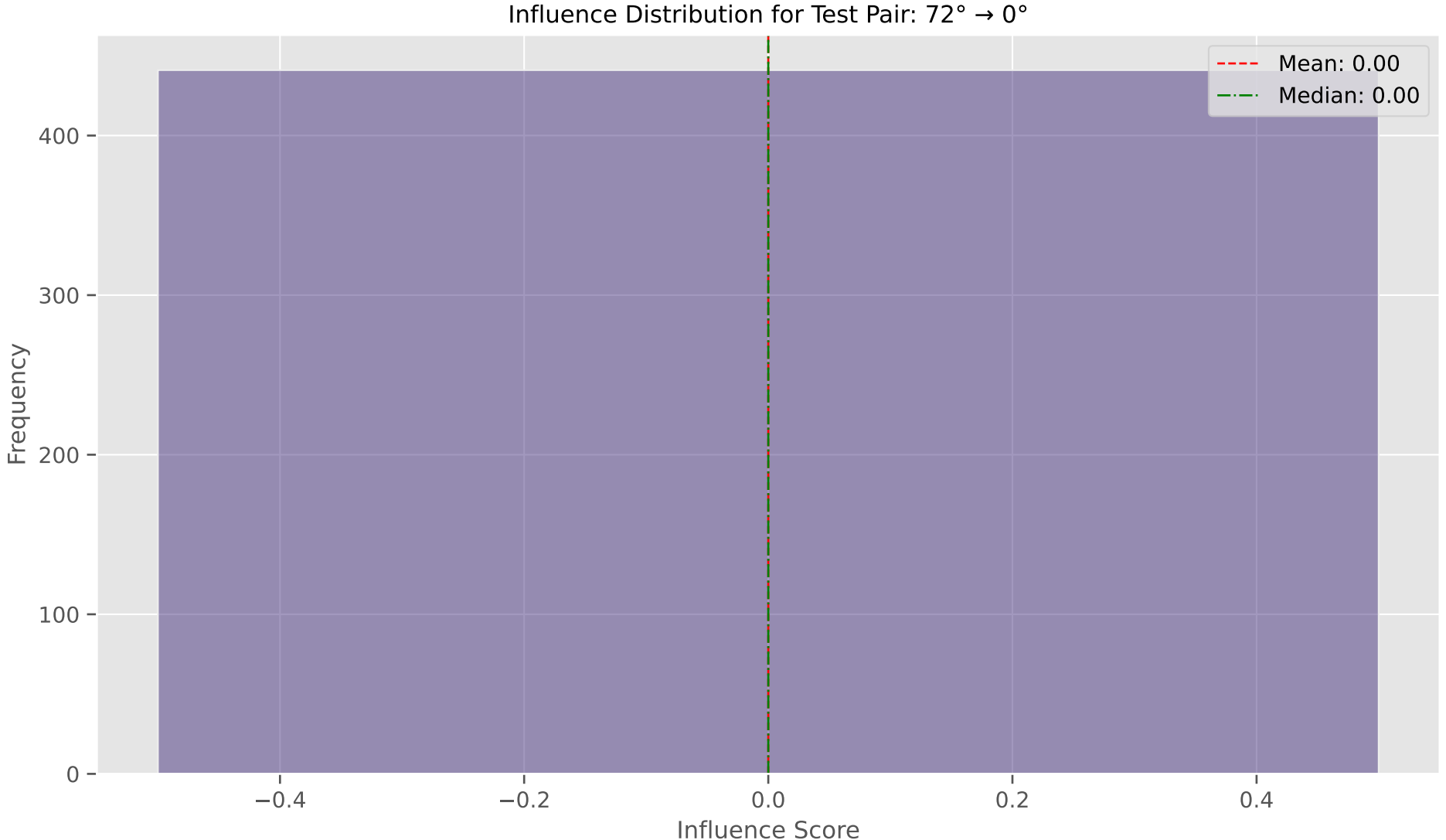

Top 10 Most Influential Pairs
plastic_deg180_500hz_07_plastic_deg000_500hz_00
plastic_deg036_500hz_04_plastic_deg000_500hz_02
plastic_deg000_500hz_06_plastic_deg144_500hz_05
plastic_deg000_500hz_08_plastic_deg144_500hz_00
plastic_deg036_500hz_04_plastic_deg072_500hz_00
plastic_deg036_500hz_05_plastic_deg108_500hz_05
plastic_deg144_500hz_01_plastic_deg036_500hz_04
plastic_deg072_500hz_00_plastic_deg180_500hz_08
plastic_deg036_500hz_00_plastic_deg144_500hz_05
plastic_deg036_500hz_07_plastic_deg108_500hz_05
0
200
400
600
800
Self-Influence Score
Bottom 10 Least Influential Pairs
plastic_deg000_500hz_08_plastic_deg144_500hz_04
plastic_deg180_500hz_02_plastic_deg000_500hz_08
plastic_deg000_500hz_00_plastic_deg036_500hz_03
plastic_deg072_500hz_06_plastic_deg180_500hz_08
plastic_deg000_500hz_08_plastic_deg108_500hz_00
plastic_deg000_500hz_02_plastic_deg144_500hz_00
plastic_deg072_500hz_00_plastic_deg000_500hz_06
plastic_deg036_500hz_01_plastic_deg108_500hz_07
plastic_deg000_500hz_07_plastic_deg108_500hz_05
plastic_deg000_500hz_08_plastic_deg144_500hz_06
0.0
0.1
0.2
0.3
0.4
Self-Influence Score

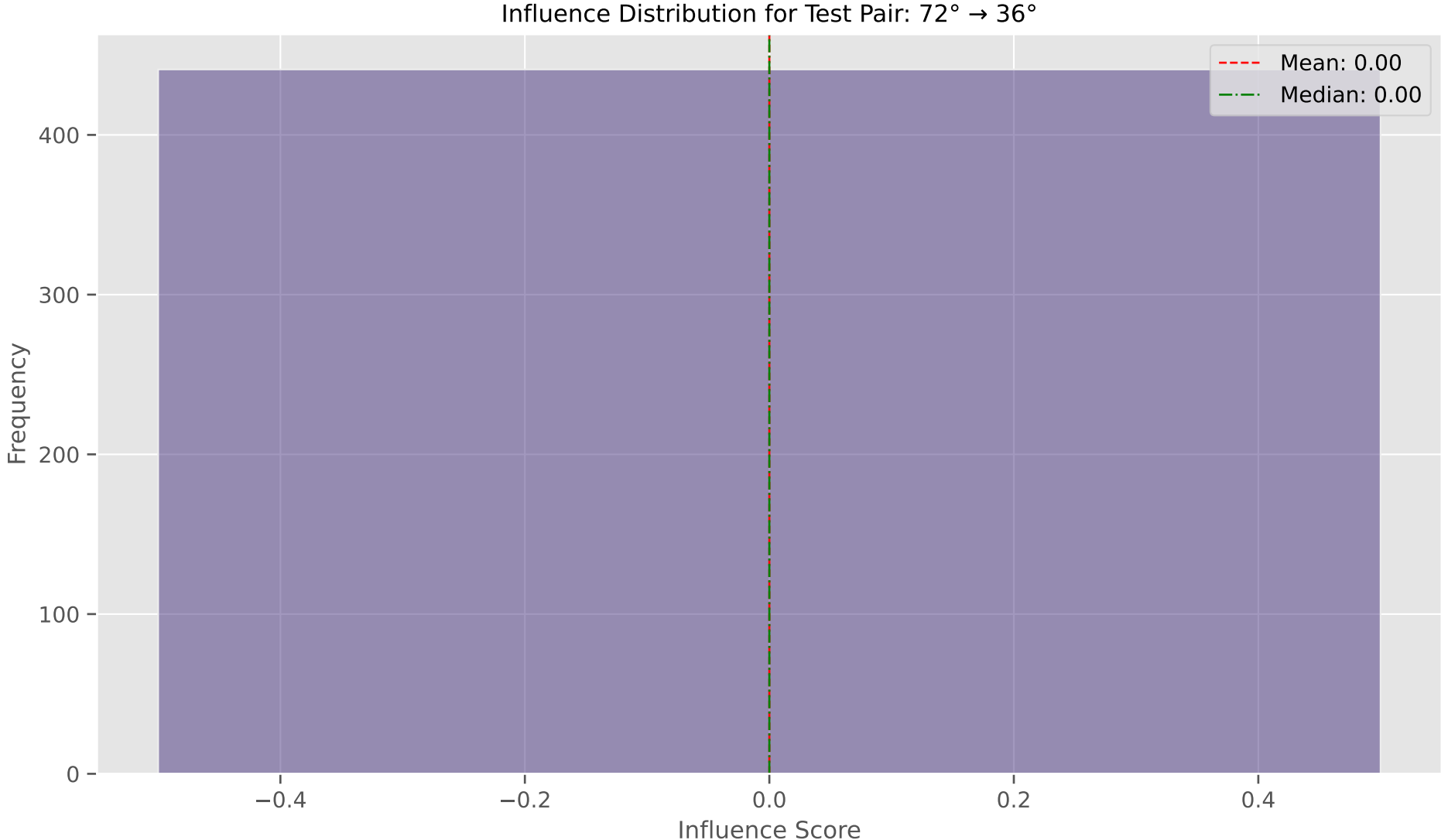

Self-Influence Score vs. Angle Difference
Average Self-Influence Score
200
150
100
50
0
−50
−100
40
60
80
100
120
140
160
180
Angle Difference (degrees)

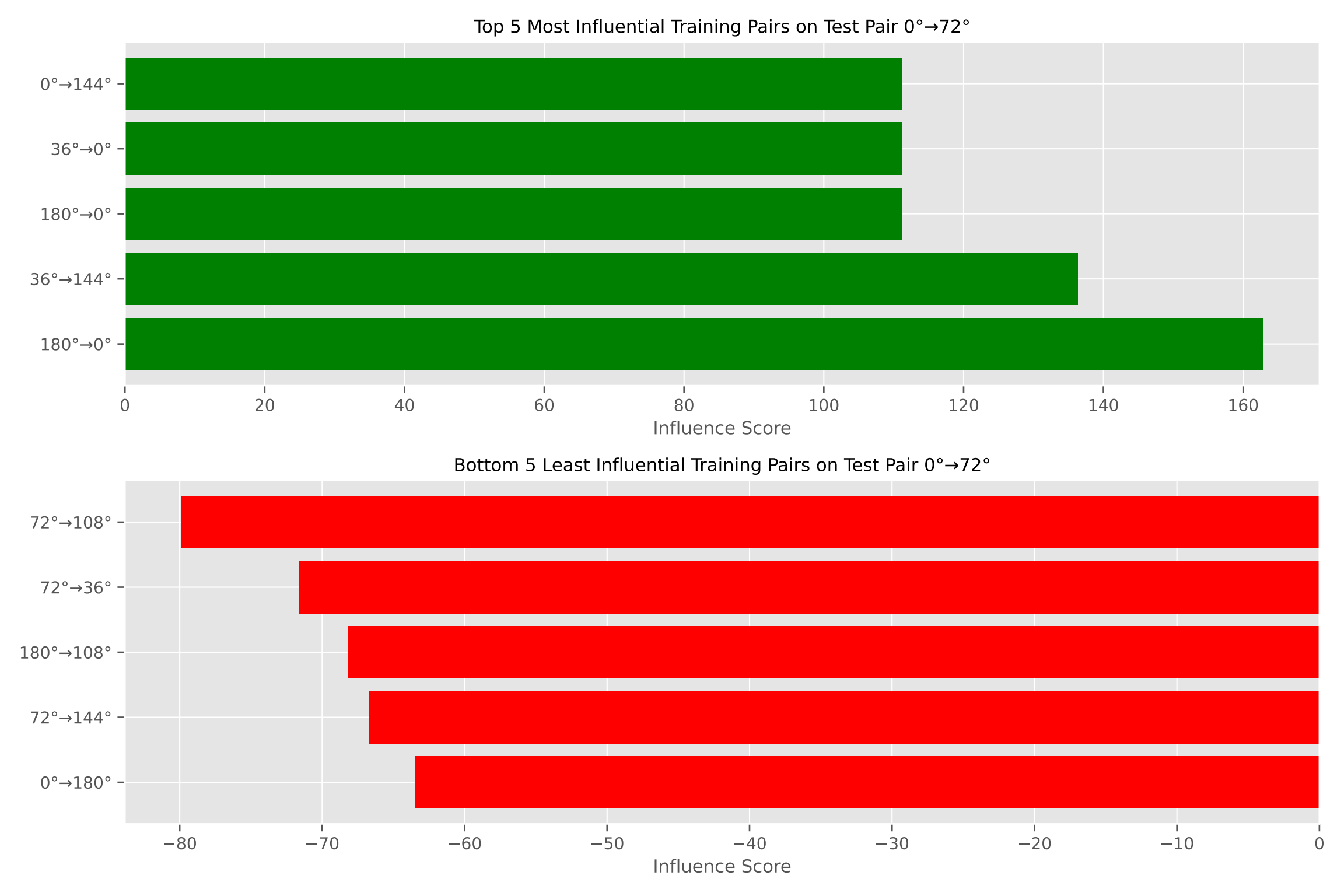
Test Influence Analysis

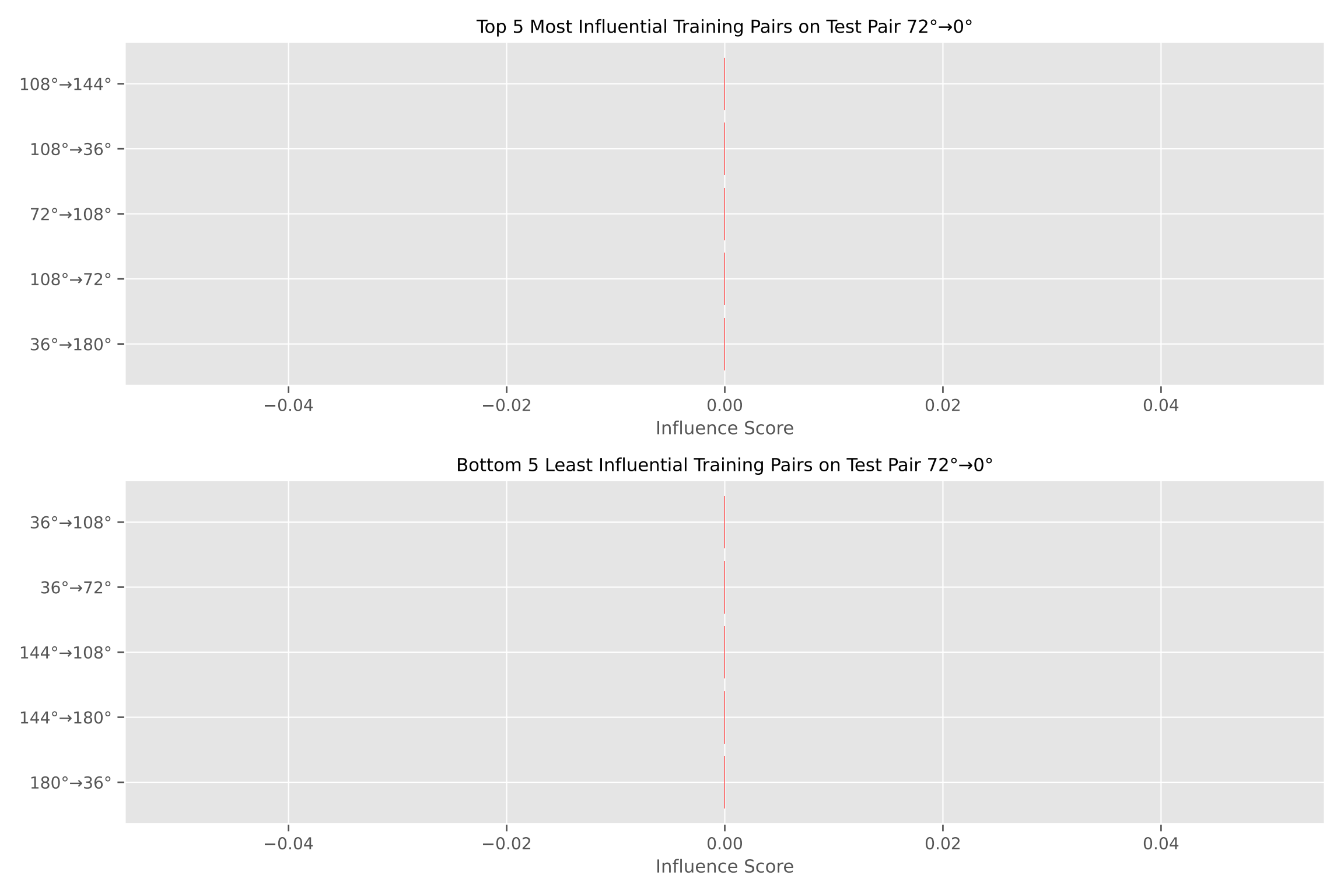
Total Test Pairs: 5

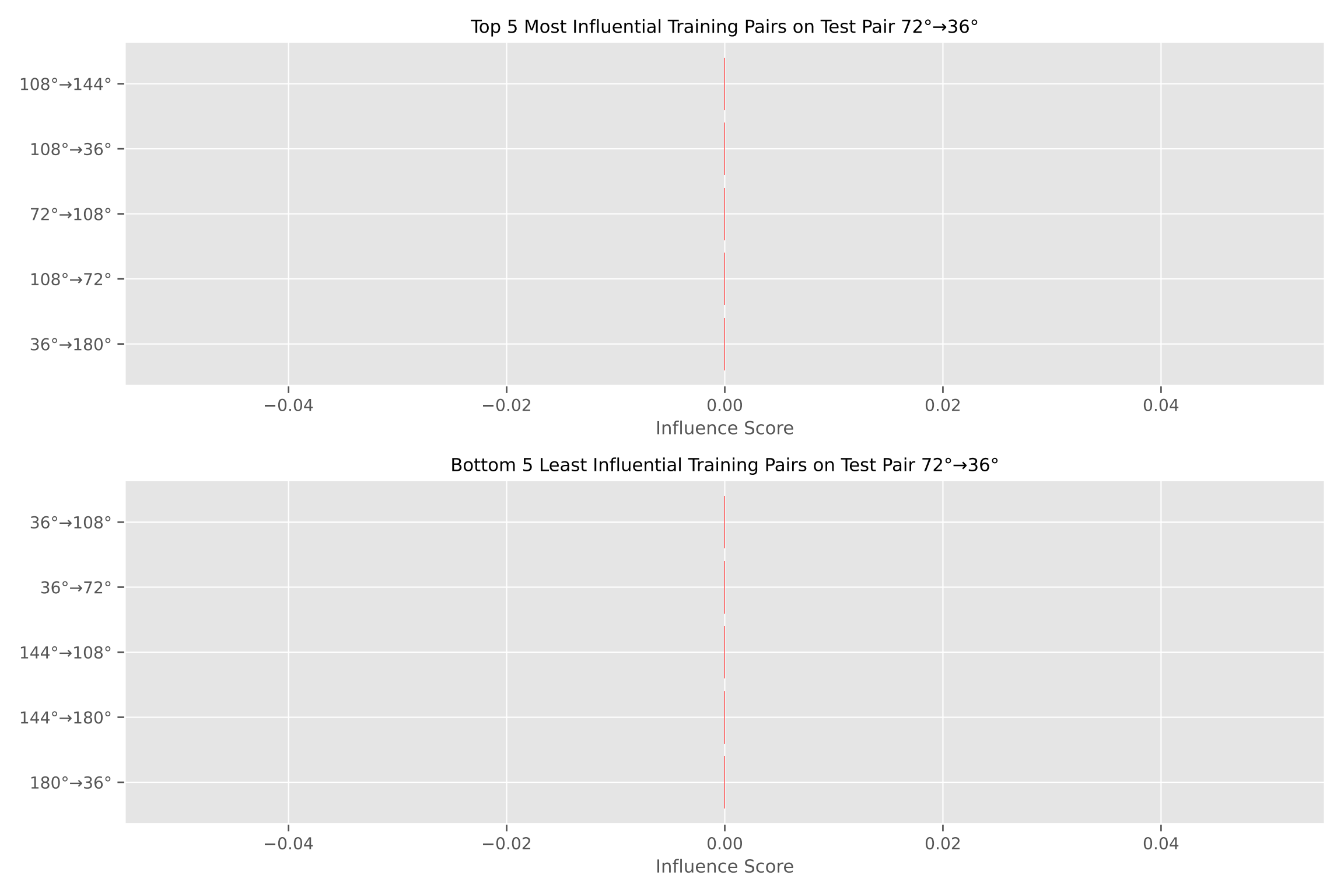

Influence Distribution for Test Pair: 0° → 72°
Mean: 0.18
Median: -2.07
Frequency
Influence Score
0
25
50
75
100
125
150
175
−50
0
50
100
150

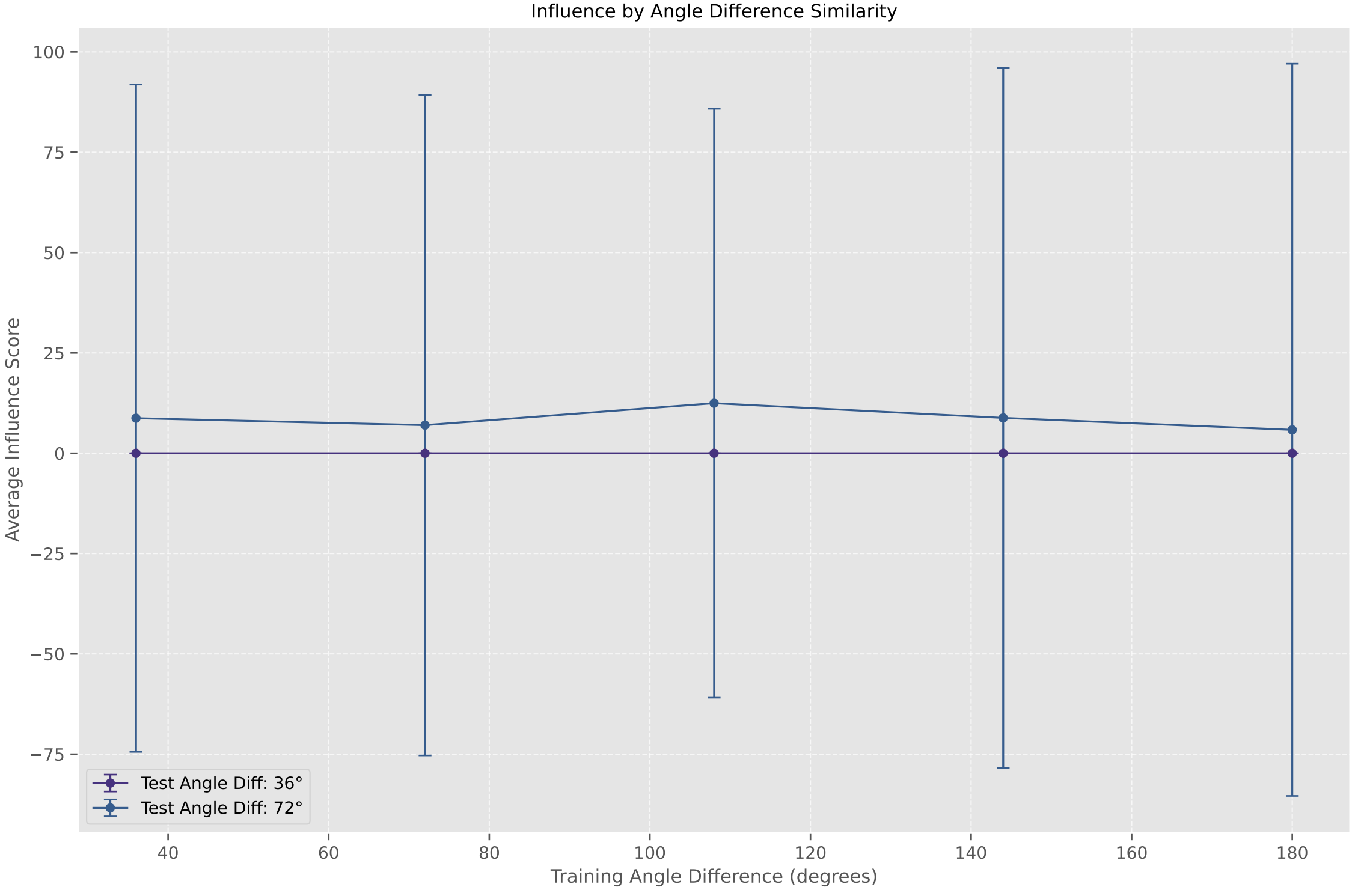

Influence Distribution for Test Pair: 72° → 0°
Mean: 0.00
Median: 0.00
Frequency
0
100
200
300
400
−0.4
−0.2
0.0
0.2
0.4
Influence Score


Influence Distribution for Test Pair: 72° → 36°
Mean: 0.00
Median: 0.00
Frequency
400
300
200
100
0
−0.4
−0.2
0.0
0.2
0.4
Influence Score


Top 5 Most Influential Training Pairs on Test Pair 0°→72°
0°→144°
36°→0°
180°→0°
36°→144°
180°→0°
0
20
40
60
80
100
120
140
160
Influence Score
Bottom 5 Least Influential Training Pairs on Test Pair 0°→72°
72°→108°
72°→36°
180°→108°
72°→144°
0°→180°
−80
−70
−60
−50
−40
−30
−20
−10
0
Influence Score


Top 5 Most Influential Training Pairs on Test Pair 72°→0°
108°→144°
108°→36°
72°→108°
108°→72°
36°→180°
−0.04
−0.02
0.00
0.02
0.04
Influence Score
Bottom 5 Least Influential Training Pairs on Test Pair 72°→0°
36°→108°
36°→72°
144°→108°
144°→180°
180°→36°
−0.04
−0.02
0.00
0.02
0.04
Influence Score


Top 5 Most Influential Training Pairs on Test Pair 72°→36°
108°→144°
108°→36°
72°→108°
108°→72°
36°→180°
−0.04
−0.02
0.00
0.02
0.04
Influence Score
Bottom 5 Least Influential Training Pairs on Test Pair 72°→36°
36°→108°
36°→72°
144°→108°
144°→180°
180°→36°
−0.04
−0.02
0.00
0.02
0.04
Influence Score


Influence by Angle Difference Similarity
Average Influence Score
Training Angle Difference (degrees)
100
75
50
25
0
−25
−50
−75
40
60
80
100
120
140
160
180
Test Angle Diff: 36°
Test Angle Diff: 72°

TracIn Analysis Conclusions

• Self-influence scores reflect sample difficulty and importance during training.

• Pairs with higher self-influence scores may require special attention during training.

• Angle difference correlates with self-influence, showing the model's sensitivity to angular changes.

• Test influence scores show how training samples affect the model's predictions on specific test pairs.

• Both positive and negative influence scores were observed, indicating that some training samples can hurt performance on specific test samples.

Recommendations

• These insights can guide data selection, augmentation strategies, and model improvements.

• Focus data collection on underrepresented or difficult angle pairs.

• Consider curriculum learning approaches using the influence difficulty order.

• Investigate and potentially remove harmful training samples with negative influence.

• Use these insights to guide model architecture decisions.