TracIn Influence Analysis Report

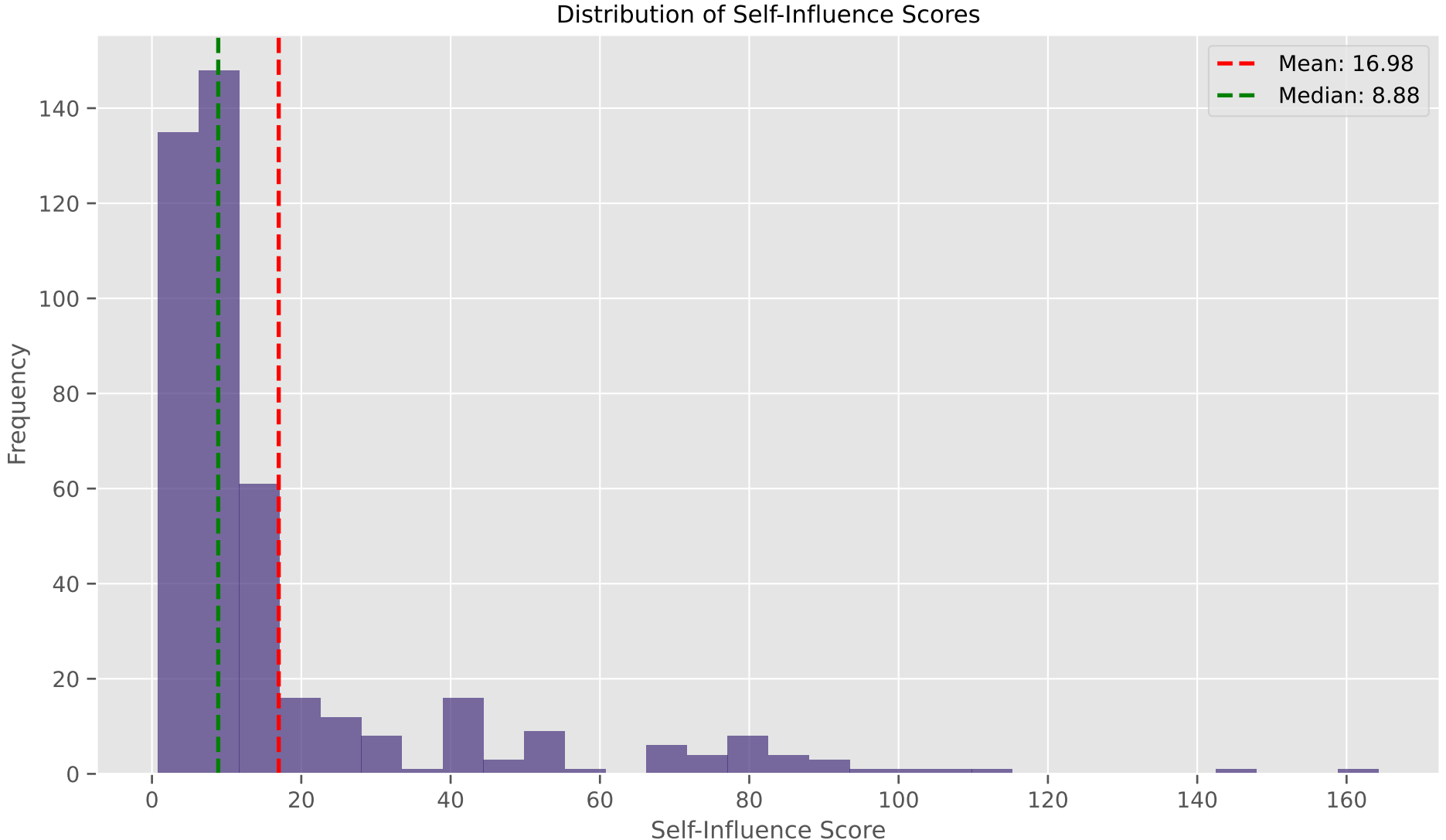
Plastic 500Hz Dataset

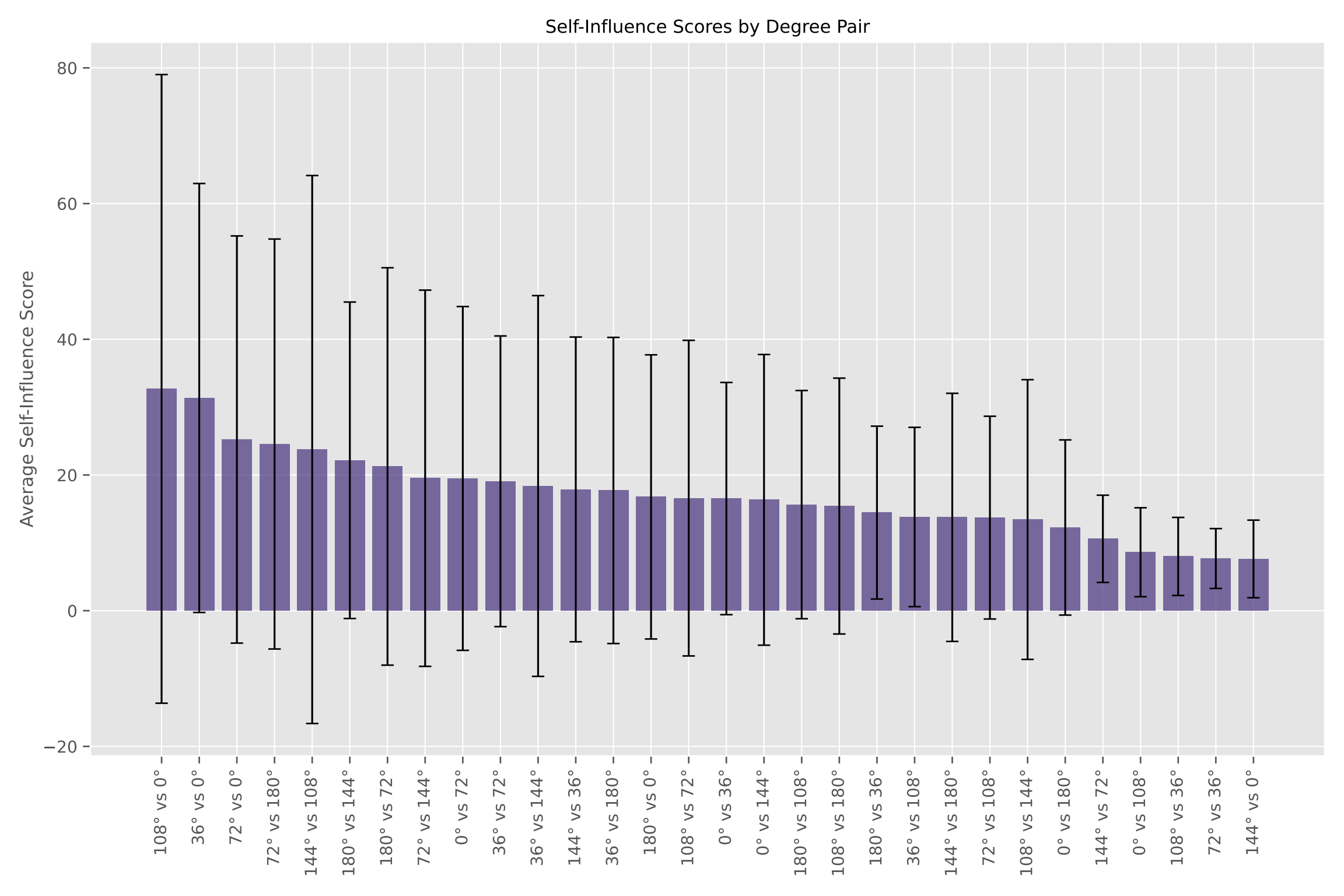
Generated on 2025-04-20 23:32:42

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

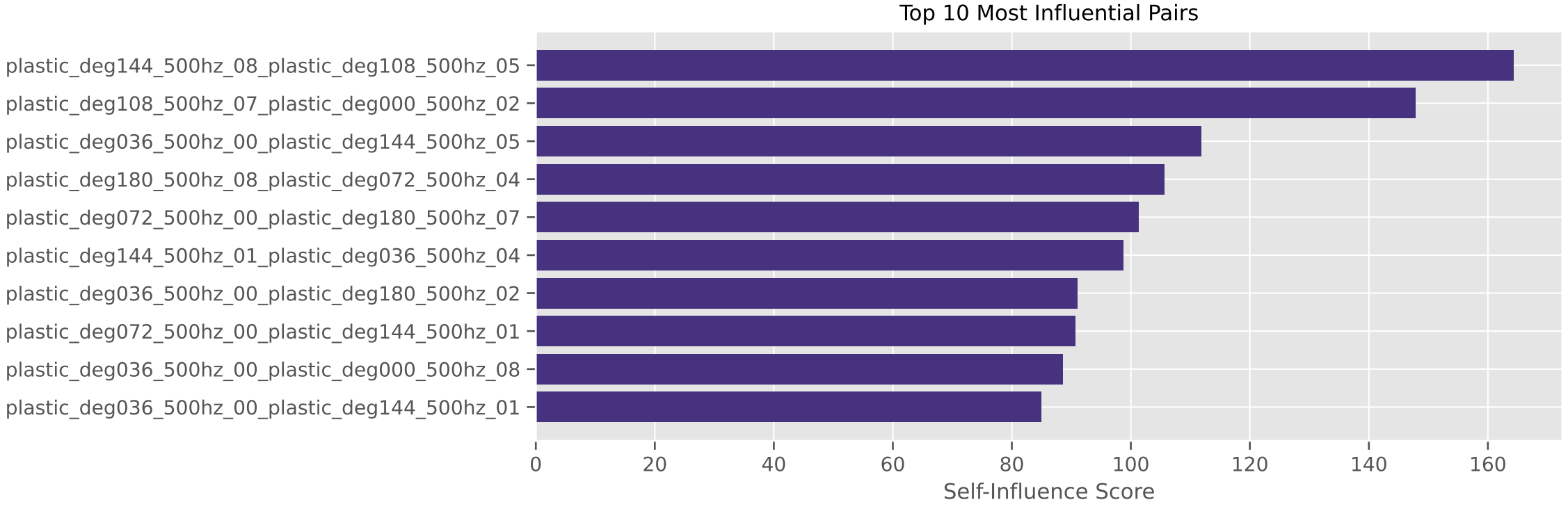
Self-Influence Analysis

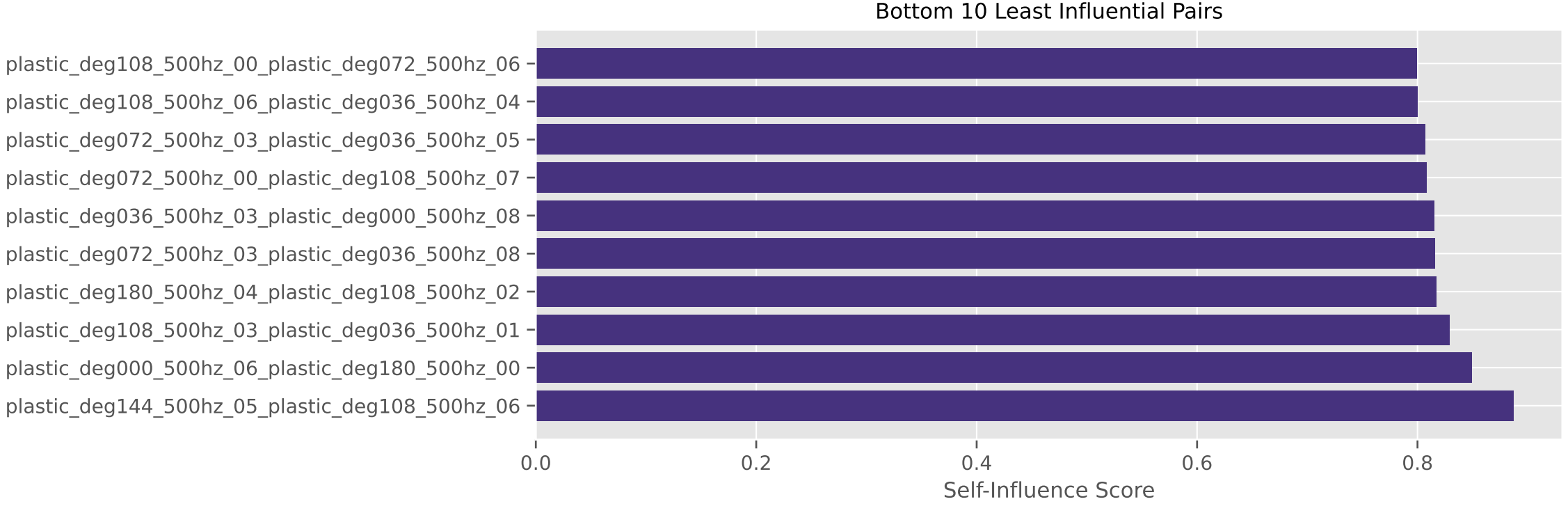
Total Samples: 441

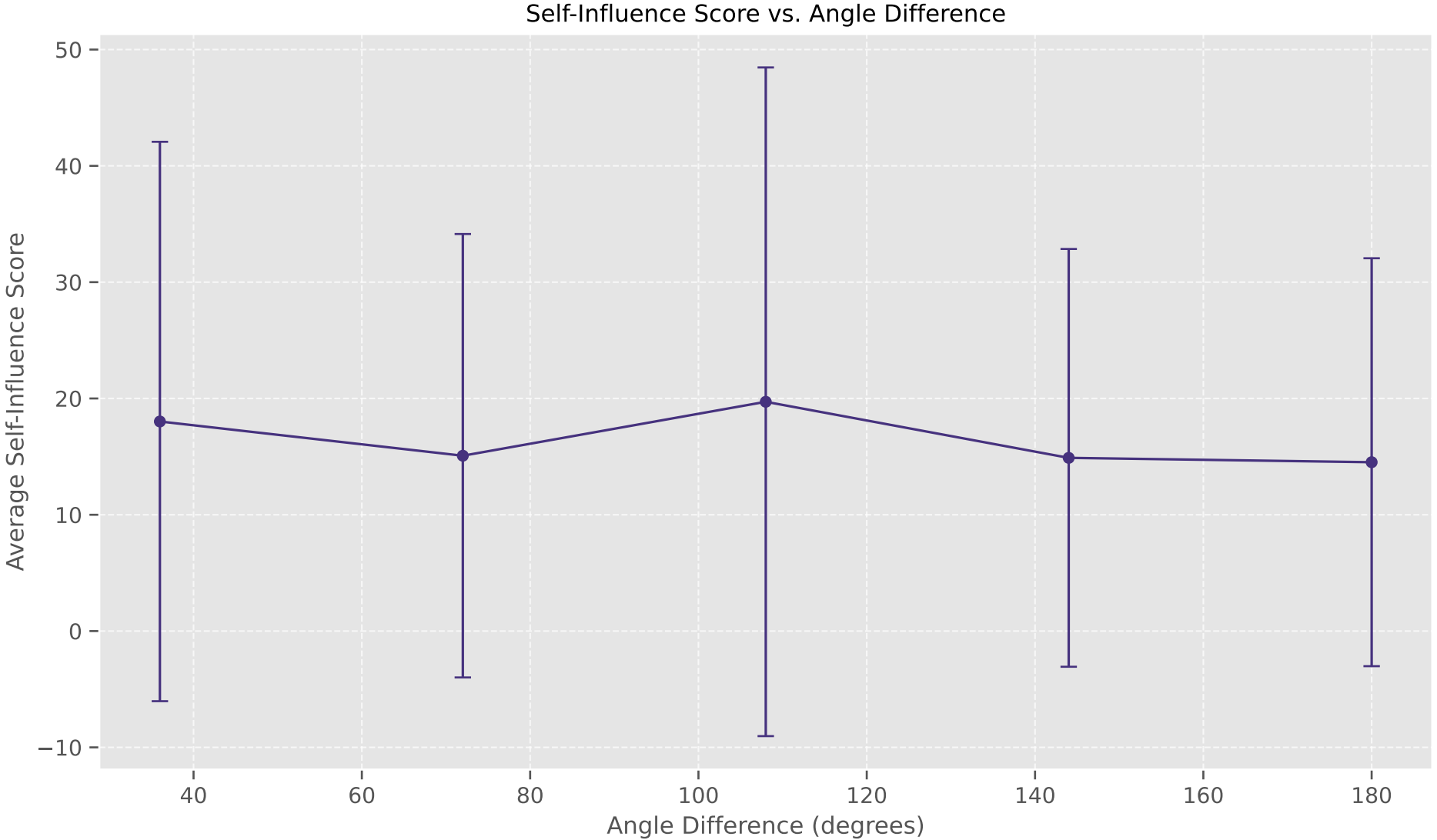

Distribution of Self-Influence Scores
Mean: 16.98
Median: 8.88
Frequency
Self-Influence Score
0
20
40
60
80
100
120
140
160


Self-Influence Scores by Degree Pair
Average Self-Influence Score
80
60
40
20
0
−20
108° vs 0°
36° vs 0°
72° vs 0°
72° vs 180°
144° vs 108°
180° vs 144°
180° vs 72°
72° vs 144°
0° vs 72°
36° vs 72°
36° vs 144°
144° vs 36°
36° vs 180°
180° vs 0°
108° vs 72°
0° vs 36°
0° vs 144°
180° vs 108°
108° vs 180°
180° vs 36°
36° vs 108°
144° vs 180°
72° vs 108°
108° vs 144°
0° vs 180°
144° vs 72°
0° vs 108°
108° vs 36°
72° vs 36°
144° vs 0°


Average Self-Influence Score by Degree Combination
First Degree
Second Degree
0°
36°
72°
108°
144°
180°
16.5
19.5
8.6
16.3
12.3
31.3
19.1
13.8
18.4
17.7
25.2
7.7
13.7
19.5
24.6
32.7
8.0
16.6
13.4
15.4
7.6
17.9
10.6
23.8
13.8
16.8
14.5
21.3
15.6
22.2
30
25
20
15
10

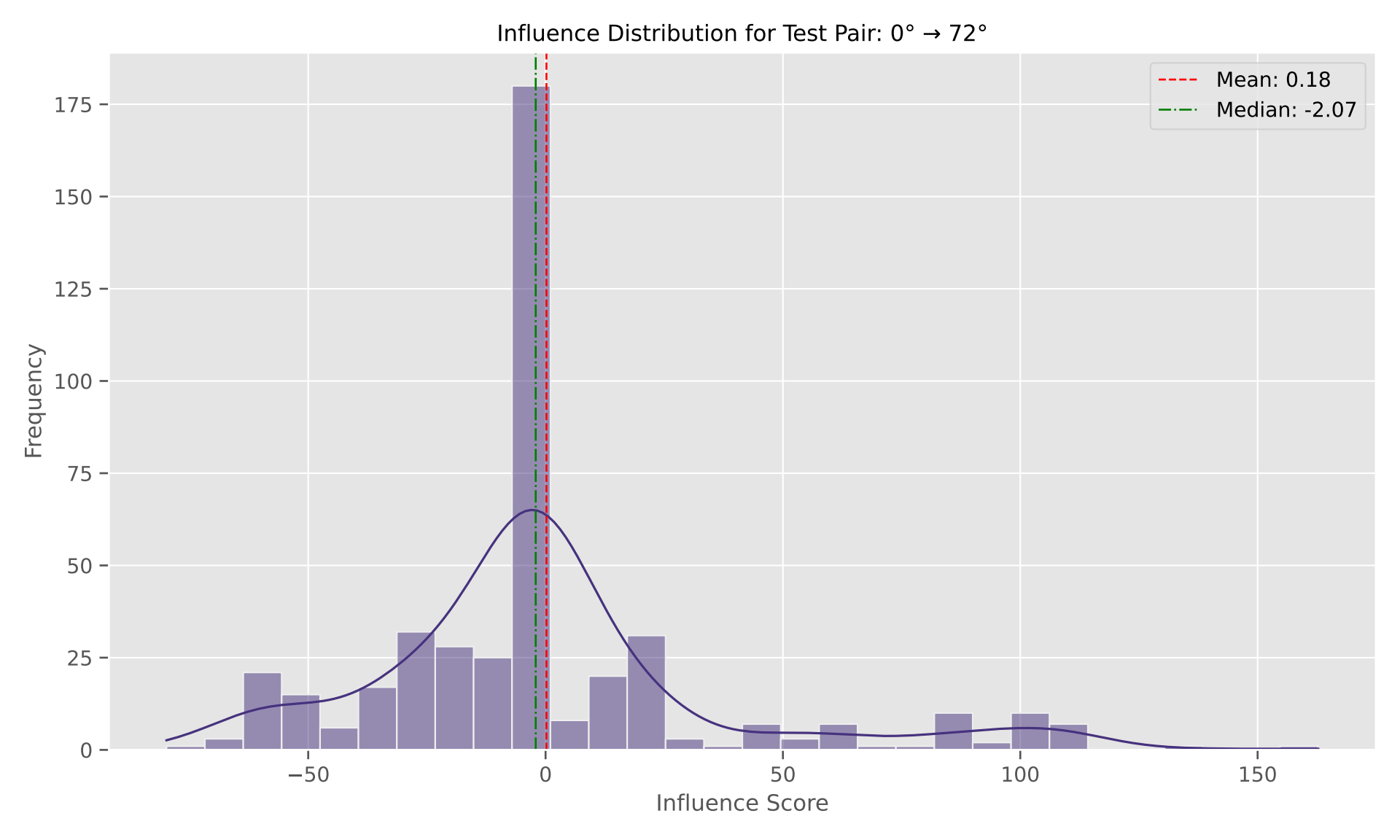

Top 10 Most Influential Pairs
plastic_deg144_500hz_08_plastic_deg108_500hz_05
plastic_deg108_500hz_07_plastic_deg000_500hz_02
plastic_deg036_500hz_00_plastic_deg144_500hz_05
plastic_deg180_500hz_08_plastic_deg072_500hz_04
plastic_deg072_500hz_00_plastic_deg180_500hz_07
plastic_deg144_500hz_01_plastic_deg036_500hz_04
plastic_deg036_500hz_00_plastic_deg180_500hz_02
plastic_deg072_500hz_00_plastic_deg144_500hz_01
plastic_deg036_500hz_00_plastic_deg000_500hz_08
plastic_deg036_500hz_00_plastic_deg144_500hz_01
0
20
40
60
80
100
120
140
160
Self-Influence Score

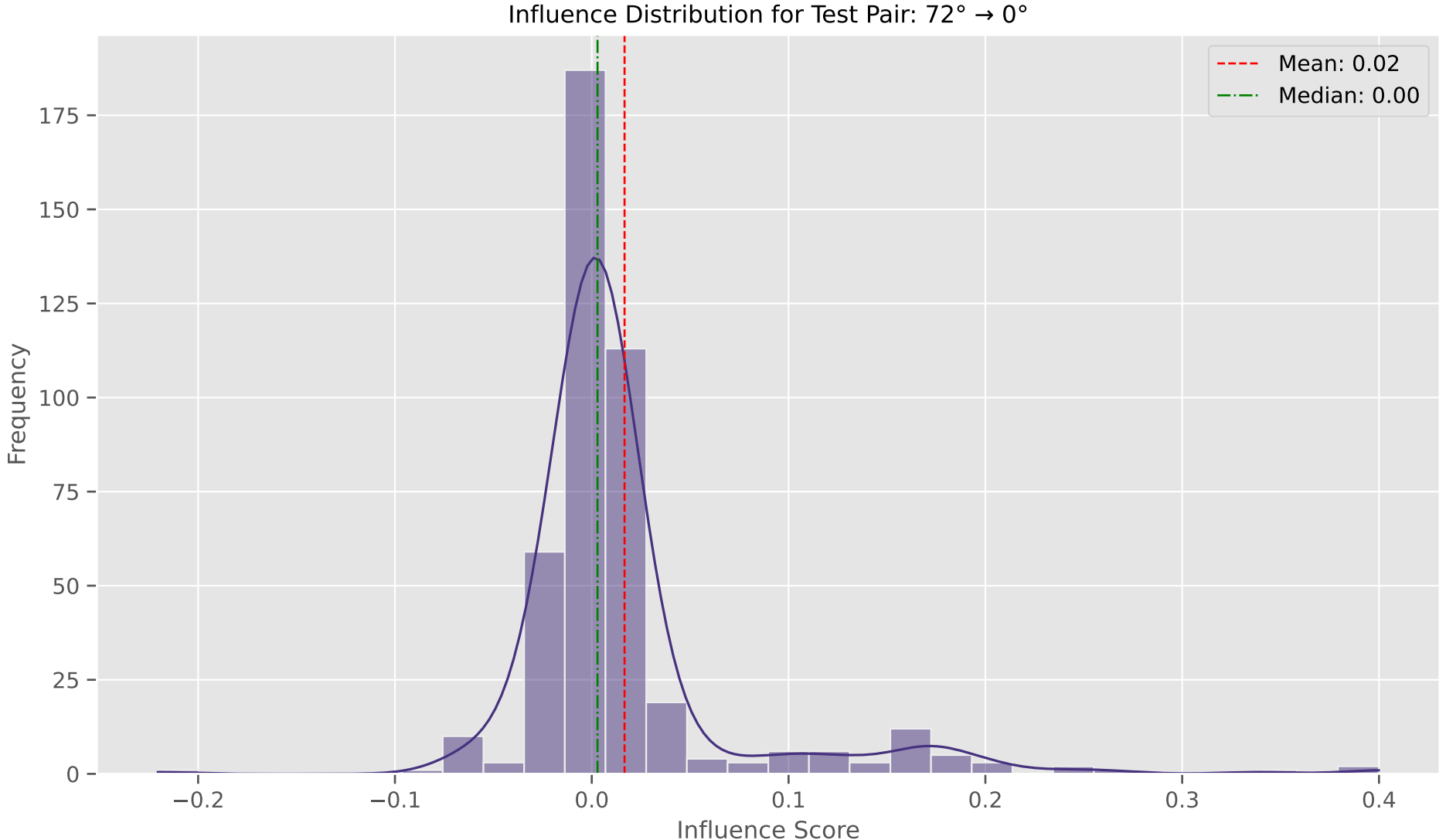

Bottom 10 Least Influential Pairs
plastic_deg108_500hz_00_plastic_deg072_500hz_06
plastic_deg108_500hz_06_plastic_deg036_500hz_04
plastic_deg072_500hz_03_plastic_deg036_500hz_05
plastic_deg072_500hz_00_plastic_deg108_500hz_07
plastic_deg036_500hz_03_plastic_deg000_500hz_08
plastic_deg072_500hz_03_plastic_deg036_500hz_08
plastic_deg180_500hz_04_plastic_deg108_500hz_02
plastic_deg108_500hz_03_plastic_deg036_500hz_01
plastic_deg000_500hz_06_plastic_deg180_500hz_00
plastic_deg144_500hz_05_plastic_deg108_500hz_06
0.0
0.2
0.4
0.6
0.8
Self-Influence Score

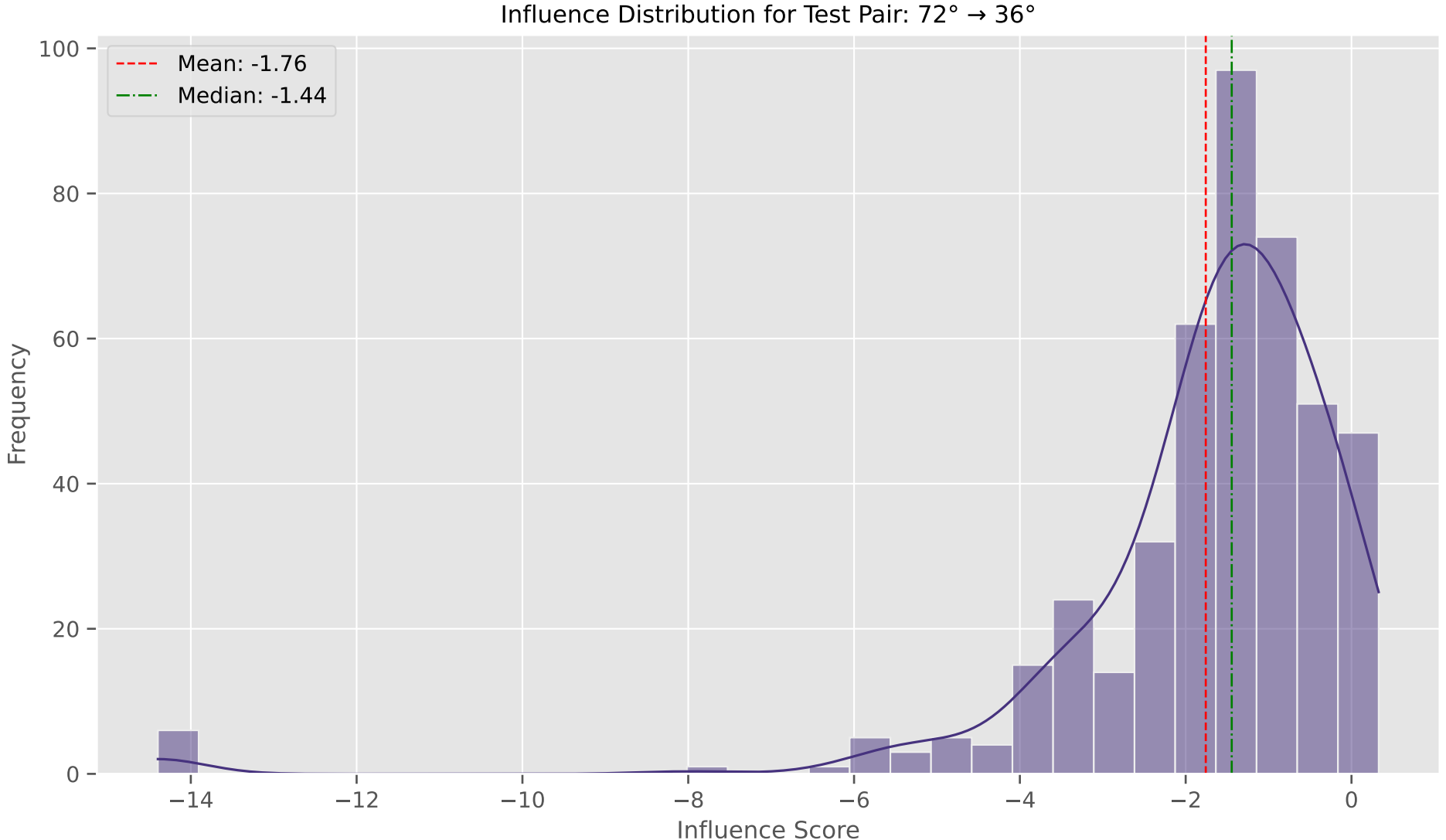

Self-Influence Score vs. Angle Difference
Average Self-Influence Score
50
40
30
20
10
0
−10
40
60
80
100
120
140
160
180
Angle Difference (degrees)

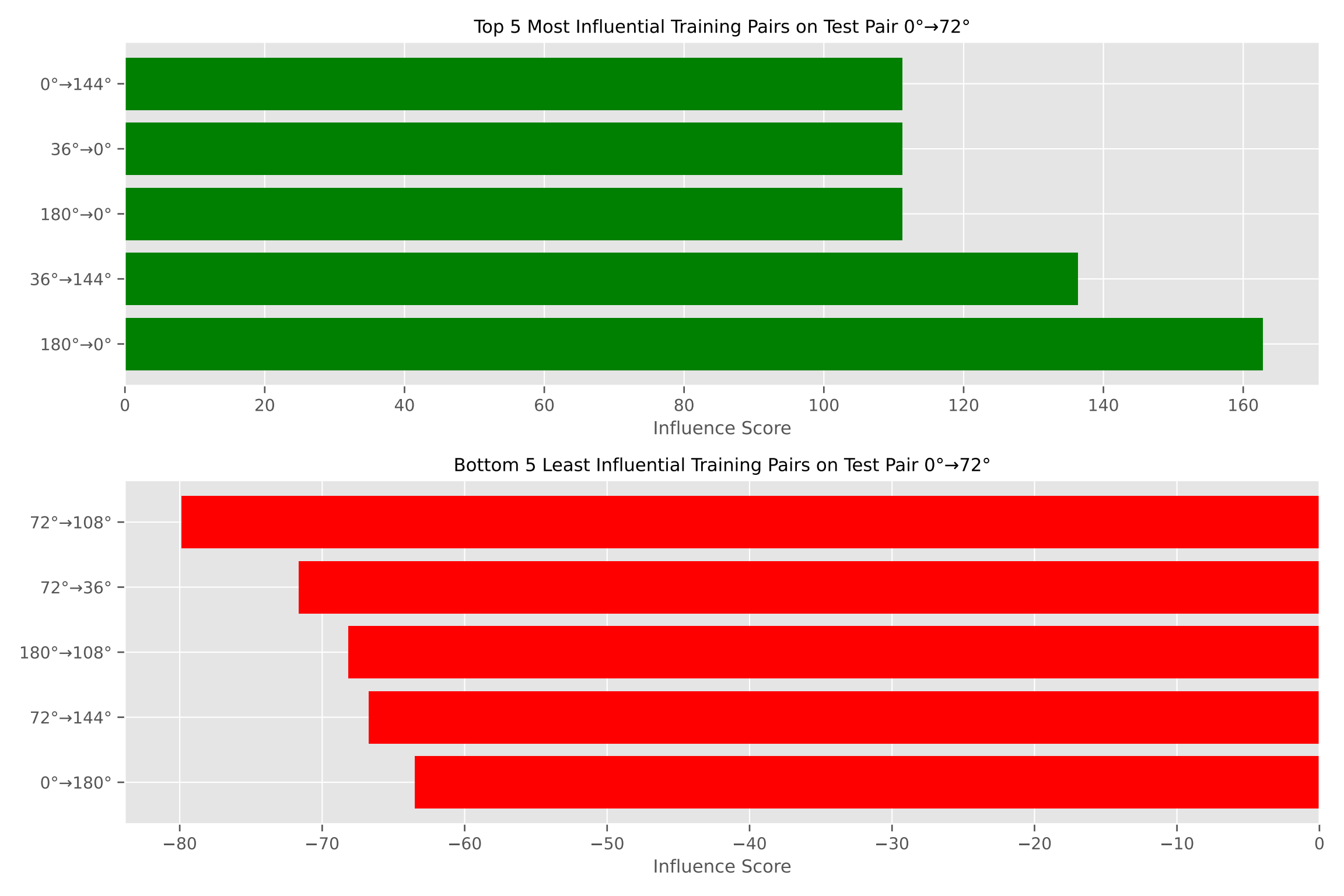
Test Influence Analysis

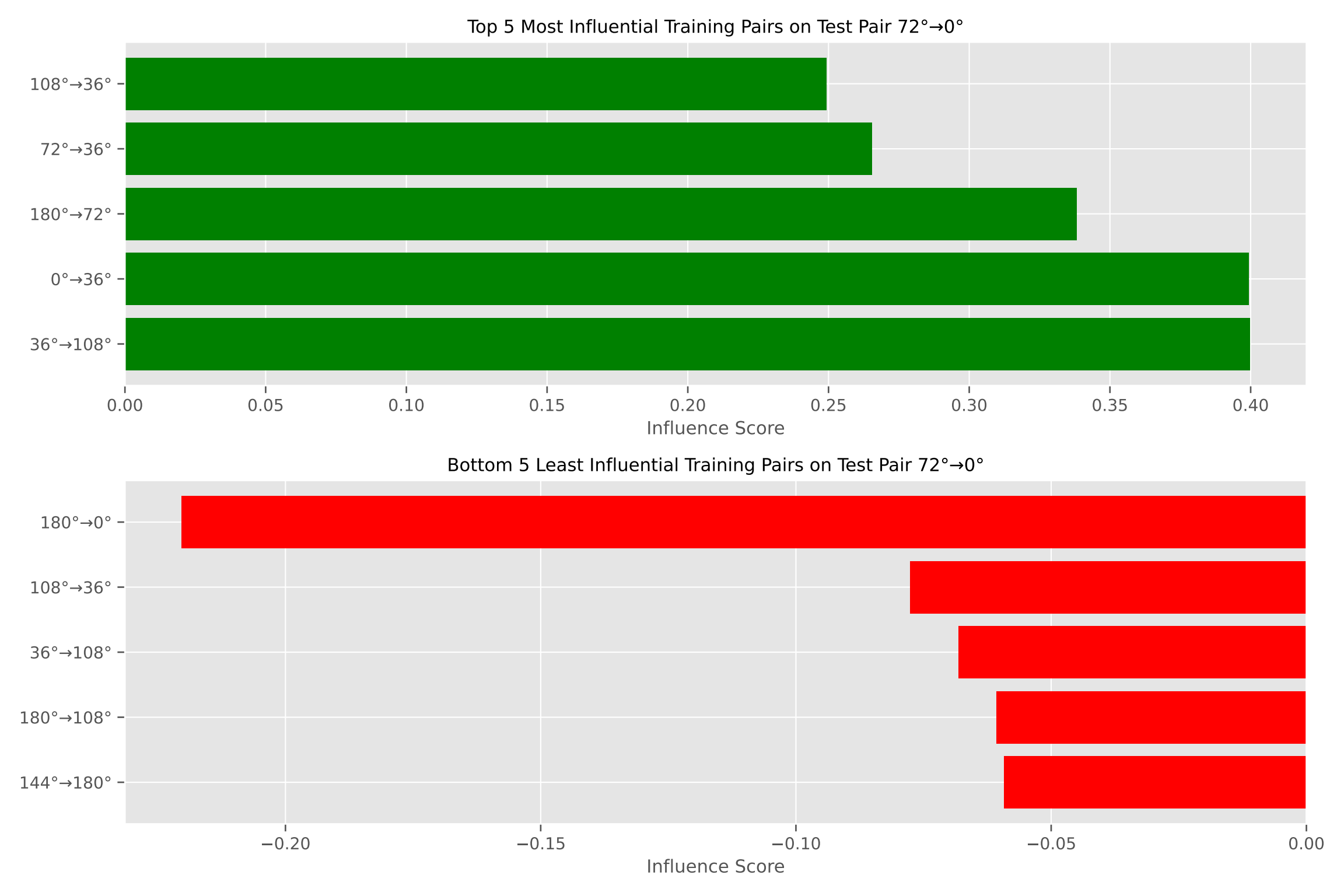
Total Test Pairs: 5

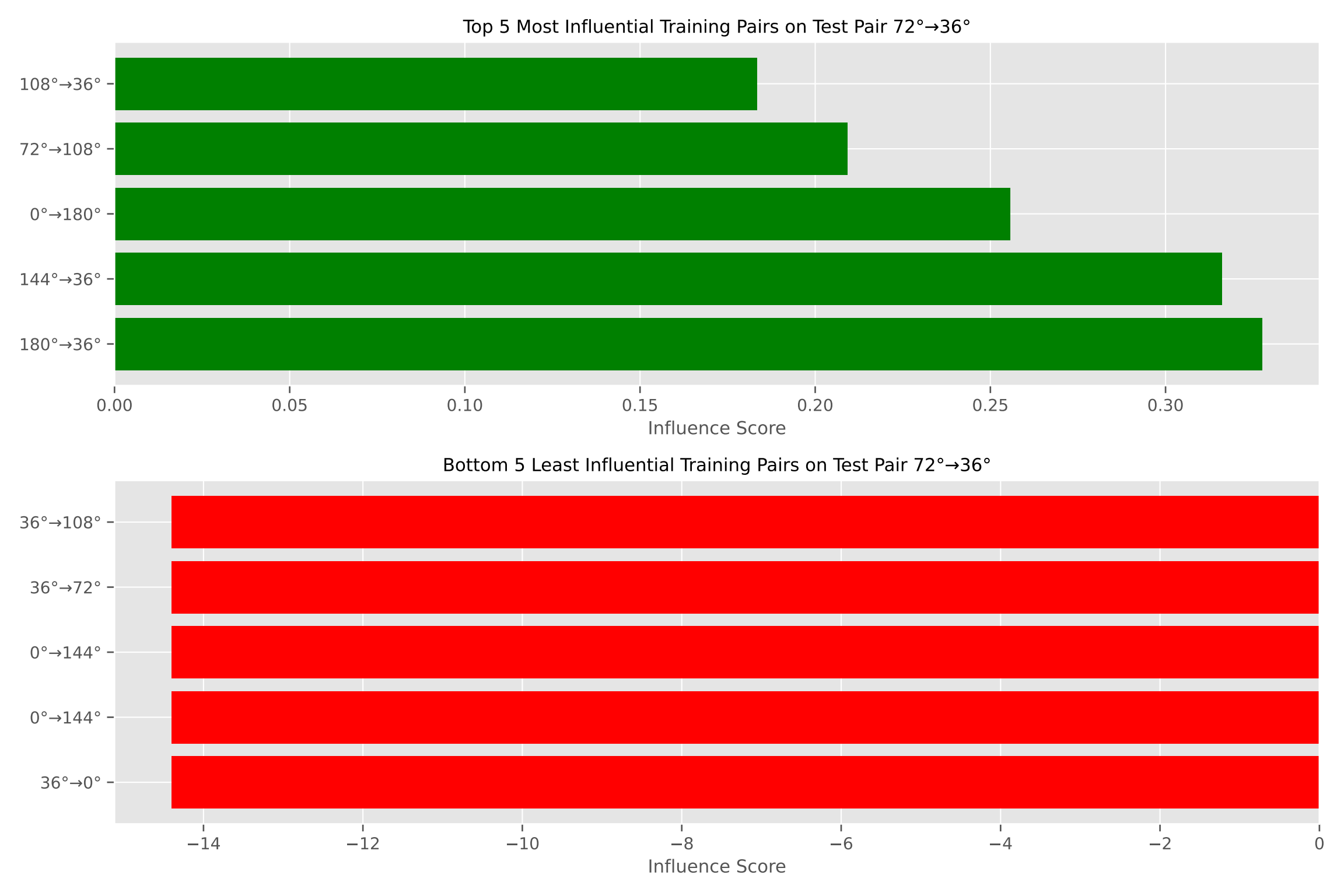

Influence Distribution for Test Pair: 0° → 72°
Mean: 0.18
Median: -2.07
Frequency
Influence Score
0
25
50
75
100
125
150
175
−50
0
50
100
150

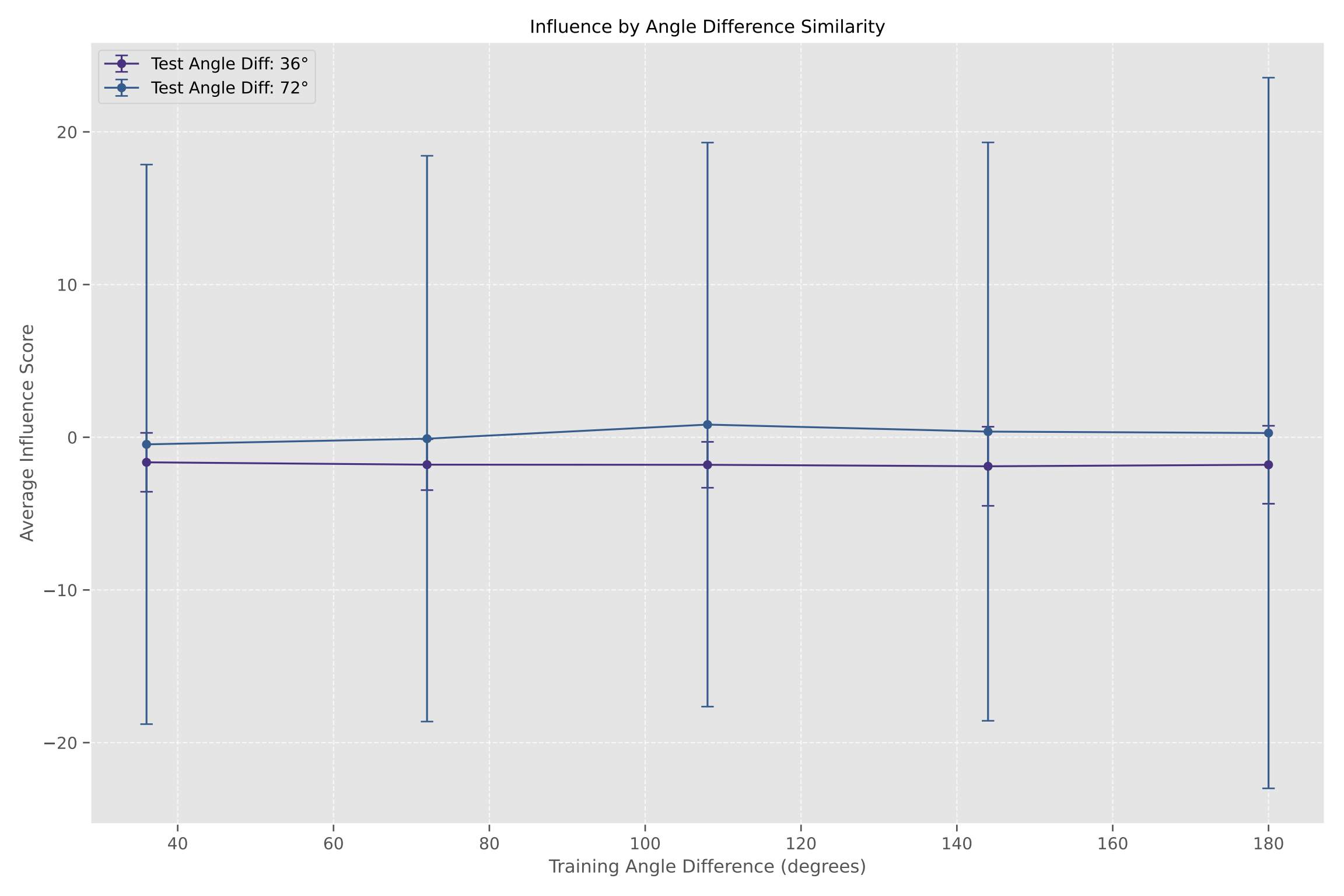

Influence Distribution for Test Pair: 72° → 0°
Mean: 0.02
Median: 0.00
Frequency
Influence Score
0
25
50
75
100
125
150
175
−0.2
−0.1
0.0
0.1
0.2
0.3
0.4


Influence Distribution for Test Pair: 72° → 36°
Mean: -1.76
Median: -1.44
Frequency
Influence Score
100
80
60
40
20
0
−14
−12
−10
−8
−6
−4
−2
0


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°→36°
72°→36°
180°→72°
0°→36°
36°→108°
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Influence Score
Bottom 5 Least Influential Training Pairs on Test Pair 72°→0°
180°→0°
108°→36°
36°→108°
180°→108°
144°→180°
−0.20
−0.15
−0.10
−0.05
0.00
Influence Score


Top 5 Most Influential Training Pairs on Test Pair 72°→36°
108°→36°
72°→108°
0°→180°
144°→36°
180°→36°
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Influence Score
Bottom 5 Least Influential Training Pairs on Test Pair 72°→36°
36°→108°
36°→72°
0°→144°
0°→144°
36°→0°
−14
−12
−10
−8
−6
−4
−2
0
Influence Score


Influence by Angle Difference Similarity
Test Angle Diff: 36°
Test Angle Diff: 72°
Average Influence Score
20
10
0
−10
−20
40
60
80
100
120
140
160
180
Training Angle Difference (degrees)

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.