New Age Competition

Analyzing G2 E-Sports' League of Legends performance.

E-Sports and League

- Multi-Million ($) Prize pools

- Millions of viewers

- Sponsored by GM, Geico, etc.

Abbreviated Game Rules:

- Destroy opponent's base

- Obtain and spend gold - get stronger
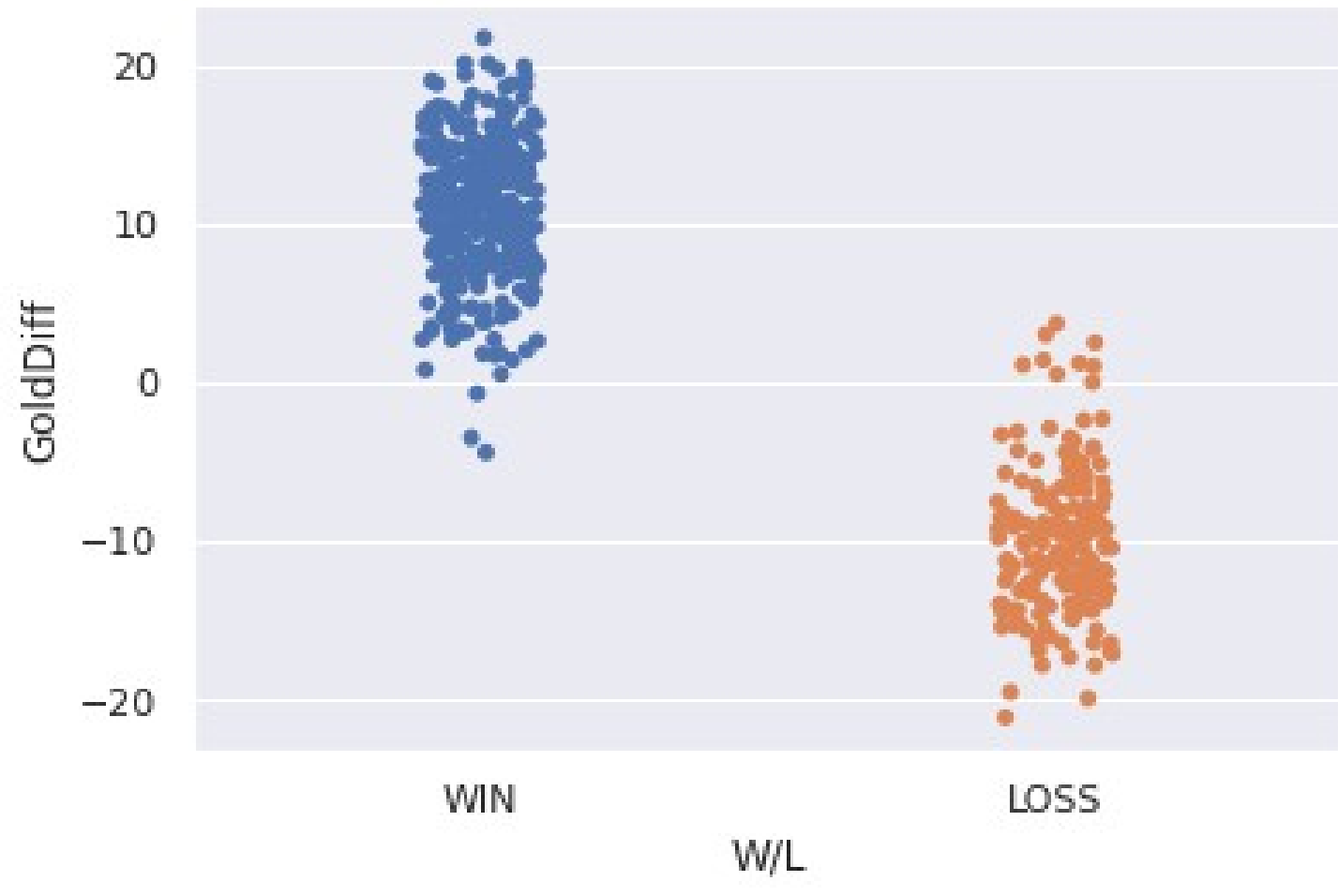
- Strong players destroy bases faster.

Data

GAMES OF LEGENDS eSPORTS

Problem

- Aggregate Gold difference between teams correlates well with match wins.

- Which aspect of the game should G2 Players focus on?

Example Data Point

Player	Wunder	DPM	398	
Role	TOP	DMG%	25%	
Kills	1	K+A Per Minute	0.15	
Deaths	2	KP%	62.5%	
Assists	4	Solo kills	NaN	
KDA	2.5	Double kills	0	
CS	223	Triple kills	0	
CS in Team's Jungle	0	Quadra kills	0	
CS in Enemy Jungle	0	Penta kills	0	
CSM	6.8	GD@15	-1525	
Golds	9582	CSD@15	-2	
GPM	294	XPD@15	-772	
GOLD%	19%	LVLD@15	-1	
Vision Score	30	Damage dealt to turrets	0	
Wards placed	16	Total heal	5664	
Wards destroyed	2	Damage self mitigated	13401	
Control Wards Purchased	5	Time ccing others	19	
VSPM	0.92	Total damage taken	13312	
WPM	0.49	Champions	Karma	
VWPM	0.15			
WCPM	0.06			
VS%	13.9%			
Total damage to Champion	12997			
Physical Damage	3595			
Magic Damage	9352			
True Damage	50			

Feature Engineering And Target Variable

Player	Wunder		DPM	398
Role	TOP		DMG%	25%
Kills	1		K+A Per Minute	0.15
Deaths	2		KP%	62.5%
Assists	4		Solo kills	NaN
KDA	2.5		Double kills	0
CS	223		Triple kills	0
CS in Team's Jungle	0		Quadra kills	0
CS in Enemy Jungle	0		Penta kills	0
CSM	6.8		GD@15	-1525
Golds	9582		CSD@15	-2
GPM	294		XPD@15	-772
GOLD%	19%		LVLD@15	-1
Vision Score	30		Damage dealt to turrets	0
Wards placed	16		Total heal	5664
Wards destroyed	2		Damage self mitigated	13401
Control Wards Purchased	5		Time ccing others	19
VSPM	0.92		Total damage taken	13312
WPM	0.49		Champions	Karma
VWPM	0.15			
WCPM	0.06			
VS%	13.9%			
Total damage to Champion	12997			
Physical Damage	3595			
Magic Damage	9352			
True Damage	50			

Exploration

|	count	mean	std	min	25%	50%	75%	max
Deaths	1120.0	3.041071	1.989272	0.000000	1.000000	3.000000	4.000000	10.00000
Assists	1120.0	6.786607	4.332474	0.000000	3.000000	6.000000	10.000000	26.00000
CS	1120.0	209.016071	108.594892	12.000000	146.500000	224.000000	282.000000	561.00000
CS in Team's Jungle	1120.0	28.635714	38.270209	0.000000	1.000000	13.000000	33.000000	169.00000
CS in Enemy Jungle	1120.0	4.234821	7.193809	0.000000	0.000000	0.000000	5.000000	54.00000
CSM	1120.0	6.365357	3.059145	0.400000	4.875000	7.200000	8.700000	11.70000
Vision Score	1120.0	49.610714	28.919232	3.000000	29.000000	40.000000	64.000000	184.00000
Wards placed	1120.0	22.731250	19.087075	2.000000	11.000000	14.000000	24.250000	99.00000
Wards destroyed	1120.0	9.611607	6.582130	0.000000	5.000000	8.000000	13.000000	53.00000
Control Wards Purchased	1120.0	8.561607	6.270756	0.000000	4.000000	6.000000	11.000000	36.00000
VSPM	1120.0	1.492116	0.776025	0.140000	0.920000	1.220000	1.890000	4.50000
WPM	1120.0	0.686071	0.536197	0.080000	0.360000	0.450000	0.742500	2.83000
VWPM	1120.0	0.260723	0.178473	0.000000	0.130000	0.200000	0.350000	0.87000
WCPM	1120.0	0.287768	0.179610	0.000000	0.150000	0.260000	0.382500	1.28000
Total damage to Champion	1120.0	13528.768750	8473.967823	929.000000	7135.250000	11777.000000	17986.750000	61430.00000
DPM	1120.0	406.388393	227.797827	31.000000	223.000000	376.000000	547.000000	1477.00000
CSD@15	1120.0	0.000000	17.661397	-96.000000	-9.000000	0.000000	9.000000	96.00000
XPD@15	1120.0	0.000000	744.893752	-2984.000000	-494.500000	0.000000	494.500000	2984.00000
LVLD@15	1120.0	0.000000	0.815401	-3.000000	-1.000000	0.000000	1.000000	3.00000
Damage dealt to turrets	1120.0	2723.891964	3168.241809	0.000000	430.750000	1574.500000	4108.500000	33242.00000
Total heal	1120.0	6332.021429	6034.148523	0.000000	1920.750000	4246.500000	9190.750000	46423.00000
Damage self mitigated	1120.0	18775.566071	13598.972885	1470.000000	9589.500000	14983.000000	24362.750000	115087.00000
Time ccing others	1120.0	20.290179	13.602446	0.000000	11.000000	18.000000	27.000000	124.00000
Total damage taken	1120.0	19647.074107	9103.310954	1318.000000	12756.750000	17972.500000	24615.000000	62847.00000
DMG Ratio	1120.0	0.810691	0.606813	0.109032	0.365807	0.595871	1.111413	4.47351

Modeling – Validation & Test

- Linear Regression Score: 0.529
- Ridge Regression Score: 0.540
- Polynomial Regression Score: -0.260

Model Results

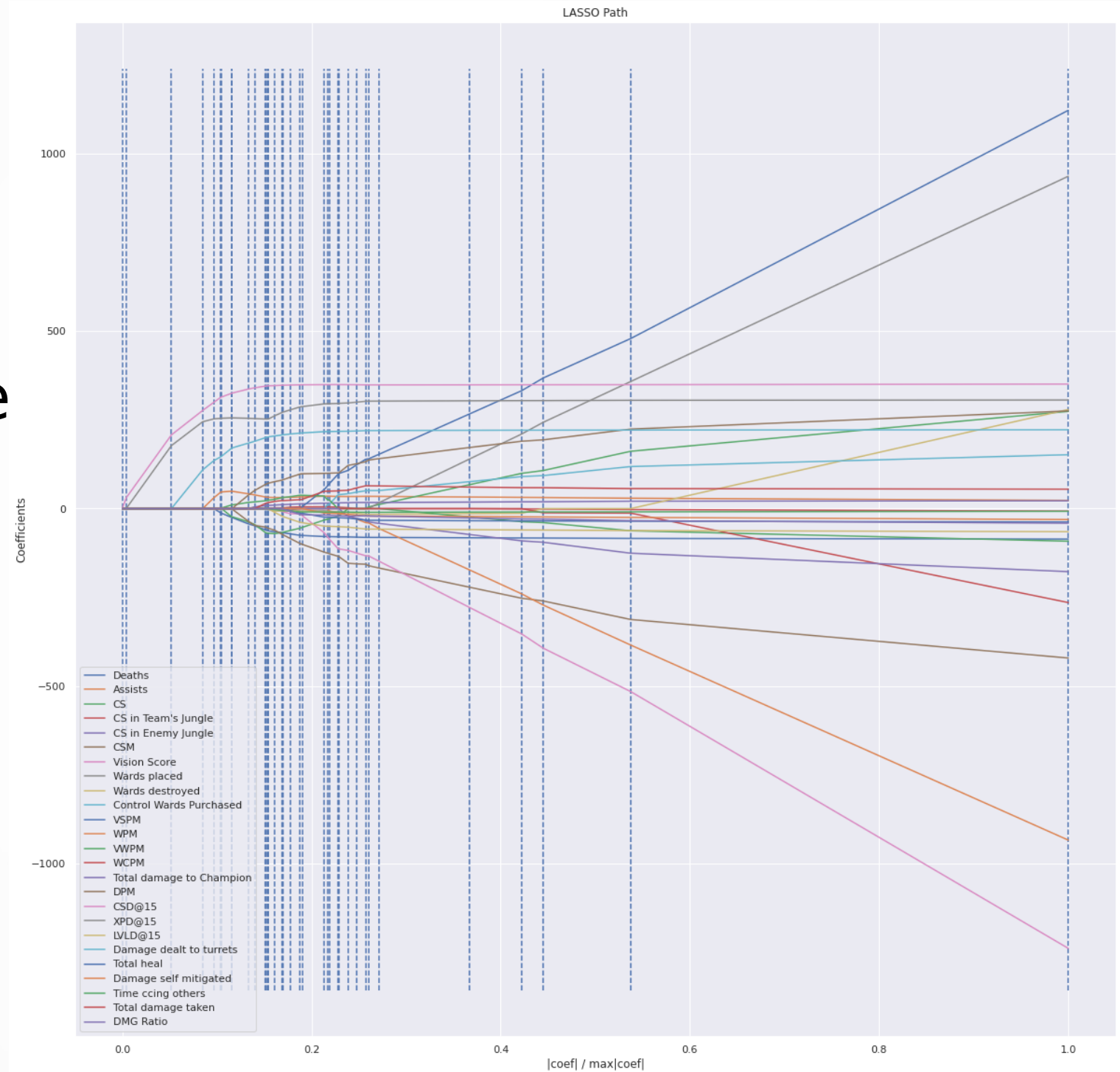Predicted Results vs Actual Gold Diff.

- Lin Reg mean score: 0.462 +- 0.026

- Ridge mean score: 0.464 +- 0.026

Final Score: .558
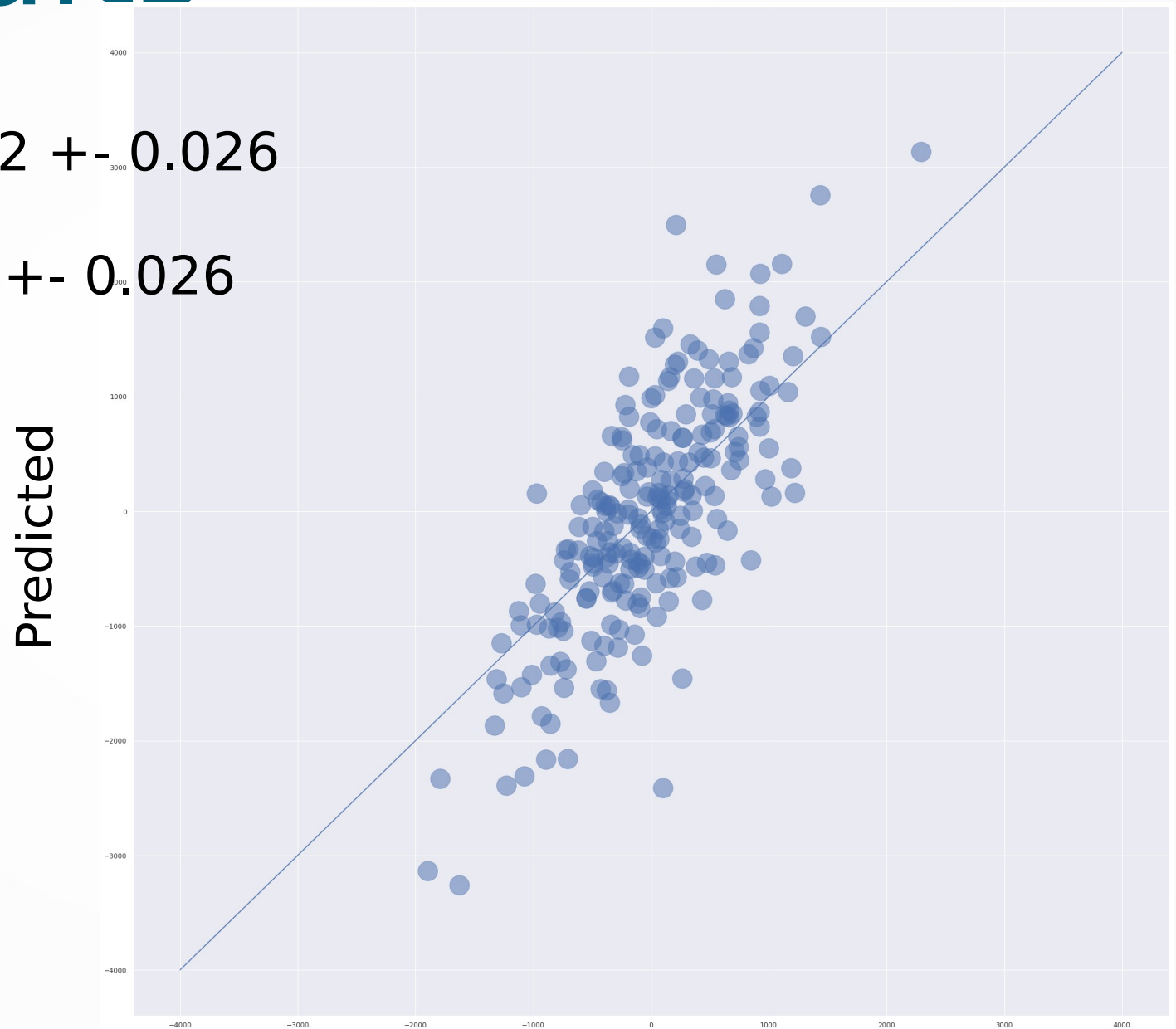
Further Results

- Lars-Path to determine CSM, XPD, LVLD, Turre Damage were important features.

Conclusions

- Can further research particular player/champion compositions, relationships between multiple teams, etc.