

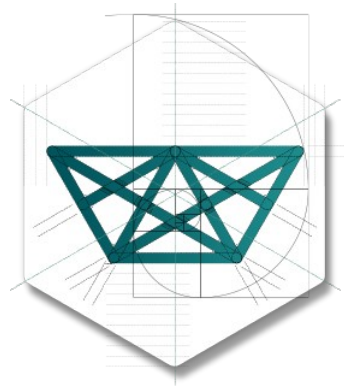


# Vectorspace AI

## NLP/NLU Correlation Matrix Datasets

For Hidden Relationships Detection in Data

(use case #42b information arbitrage)





# Predicting Future Correlations

Example dataset use case #42b(IHE ETF benchmark)

## Bristol-Myers to buy Celgene in \$74B deal

7:03 AM ET Thu, 3 Jan 2019

Bristol-Myers Squibb Company and Celgene Corporation announce that they have entered into a merger agreement under which Bristol-Myers Squibb will acquire Celgene in a cash and stock transaction with an equity value of approximately \$74 billion.

- Get an alert, discover hidden relationships, identify information arbitrage opportunities and capture alpha.
- Extract relationships based on sympathetic, symbiotic, parasitic or latent entanglement

The following slides represent a basket of equities that have known and hidden relationships to CELG. **(IHE ETF benchmark)**



IHE 145.08

CELG 88.26 ×

AGIO 52.53 ×

YAHOO!  
FINANCE





IHE 142.00 CELG 85.06 × ADRO 2.96 ×





IHE 142.00 CELG 85.06 × SHPG 178.95 ×



- | +



IHE 145.90 CELG 85.35 X XLRN 42.33 X



- | +



IHE 141.16   CELG 66.52 ×   EPZM 6.46 ×



# Predicting Future Correlations

Example NLP/NLU dataset use cases (continued)

**The following slides represent additional dataset use cases**



**Short basket generation:** AVRO drops 51.55% on news 10/1/18. The dataset is used to detect the top 5 equities that are related to AVRO based on sympathetic, symbiotic or parasitic relationships. Over time, these begin to drop.

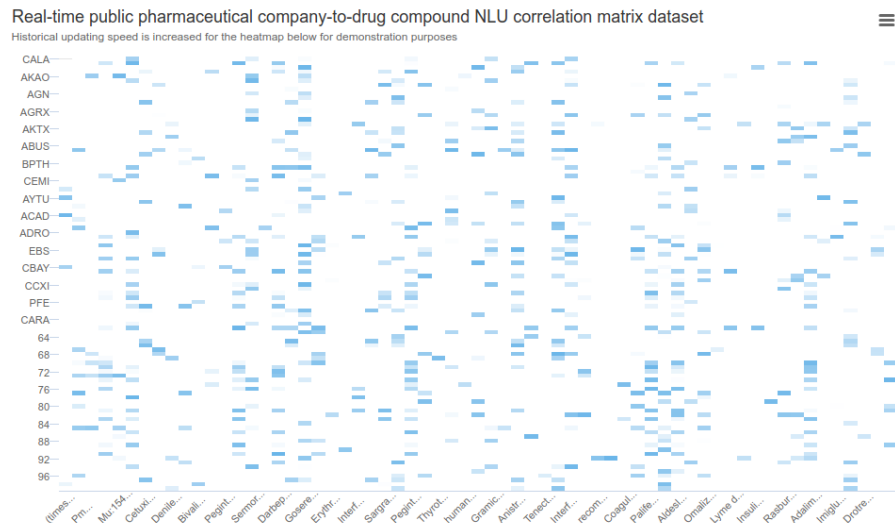
VXV Short Basket Non-optimized	Special Event	Top scoring					Benchmark	
	AVRO	BLUE	QURE	CBMG*	RGNX	ABEO	S&P(SPY)	IHE (iShares Pharma ETF)
<b>09/28/18</b> Close	<b>51.87</b>							
<b>10/01/18</b> Open	35	<b>146</b>	<b>37.3</b>	<b>17.79</b>	<b>76.01</b>	<b>12.81</b>	<b>292.11</b>	<b>168.21</b>
Low	21.58	139.25	33.36	17.79	74.64	12.54	290.98	165.58
Close	25.13	140.79	33.93	19.26	75.15	12.56	290.04	165.45
	51.55%	3.57%	9.03%	-8.26%	1.13%	1.95%	0.71%	1.64%
<b>10/02/18</b> Open	25.06	140.29	33.93	19.11	75.57	12.54	291.56	165.84
Low	20.47	138.8	33.23	18.06	67.95	11.34	291.14	165.09
Close	20.48	143.66	33.5	18.16	69.4	11.66	289.87	165.52
	60.52%	1.60%	10.19%	-2.08%	8.70%	8.98%	0.77%	1.60%
<b>10/03/18</b> Open	20.71	143.61	33.5	18.79	69.56	11.7	292.74	166.43
Low	20.3	139.66	31.05	18.43	67	11.38	291.32	166.43
Close	23.54	144	33.09	19.15	68.49	11.9	290.03	167.22
	54.62%	1.37%	11.29%	-7.64%	9.89%	7.10%	0.71%	0.59%

\*CBMG previous open: 21.65  
On 9/28/18

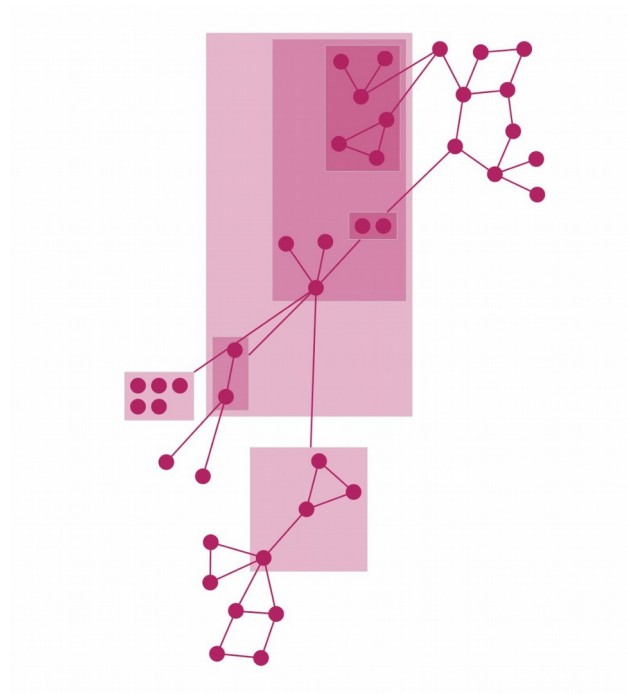
**Short basket generation:** LITE drops 32.98% on news 11/12/18. The dataset is used to detect the top 10 equities that are related to LITE based on sympathetic, symbiotic or parasitic relationships. Over time, these begin to drop.

VXV Short Basket Non-optimized	Special Event	Top scoring										Benchmark
	<b>LITE</b>	<b>IIVI</b>	<b>OCLR</b>	<b>COHR</b>	<b>IPGP</b>	<b>FNSR</b>	<b>FN</b>	<b>NPTN</b>	<b>AVGO</b>	<b>ACIA</b>	<b>AAOI</b>	<b>S&amp;P(SPY)</b>
<b>11/09/18</b>												
Close	<b>55.95</b>											
<b>11/12/18</b>												
Open	44.02	<b>36.39</b>	<b>7.9</b>	<b>129.35</b>	<b>135.49</b>	<b>21.03</b>	<b>50.04</b>	<b>8.51</b>	<b>231</b>	<b>45.31</b>	<b>21.13</b>	<b>277.19</b>
Low	37	31.92	7.31	118.03	126.82	20.31	47.31	7.75	220.28	42.91	19.23	271.99
Close	37.5	33.25	7.4	122.09	129.11	20.93	48.4	8.02	221.3	43.28	19.63	270.99
	32.98%	8.63%	6.33%	5.61%	4.71%	0.48%	3.28%	5.76%	4.20%	4.48%	7.10%	2.24%
<b>11/13/18</b>												
Open	37.96	33.58	7.27	122.89	130.08	20.9	48.75	8.05	225.49	43.03	19.55	273.09
Low	37.75	33.58	7.27	121.61	130.02	20.9	48.75	8.03	222.32	42.85	19.55	271.25
Close	38.95	36.04	7.54	123.26	132.85	21.92	49.65	8.06	222.49	43.78	20.16	270.48
	30.38%	0.96%	4.56%	4.71%	1.95%	-4.23%	0.78%	5.29%	3.68%	3.38%	4.59%	2.42%
<b>11/14/18</b>												
Open	39.2	36.52	7.63	125.86	132.45	22	50.13	8.27	226.76	43.93	20.5	274.16
Low	38.42	35.33	7.53	123.52	131.4	21.75	49.6	8.21	225.62	43.5	20.18	268.45
Close	38.85	36.2	7.57	128.64	134.95	22.57	49.73	8.24	223.84	44.62	20.19	268.63
	30.56%	0.52%	4.18%	0.55%	0.40%	-7.32%	0.62%	3.17%	3.10%	1.52%	4.45%	3.09%

# Context-controlled Clustering:



# Relationship Networking:



## Portfolio protection, risk reduction scenario:

1. A component in a portfolio has hidden relationships based on sympathetic, symbiotic or parasitic latent entanglement to another equity
2. That equity has dropped significantly
3. Get an alert and react

## Additional example use cases:

- Predicting future correlations between equities
- Determine if price correlations have similar NLP/NLU correlations
- Automatically create baskets of equities based on real-time peer reviewed published scientific papers or patents
- Detach the custom columns and append them to other proprietary in-house datasets
- Context-controlled correlations (e.g. biological, chemical, geophysical and others) to derive different signals
- Use a single equity as a seed and model cross-correlations between other equities
- Create vectors with feature attributes using trending terms or events