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ACCERN XYME

Predictive Modeling for Insight-Driven Investment Decisions

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ACCERN XYME

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$100B

Asset Under Management Influenced by Accern Product Offerings.

$4M

Investments Raised from Institutional Investors in 3 Investment Rounds.

25

Full-time Employees at Accern with a Majority of Data Scientists.

2014

Accern was founded in 2014 by Kumesh Aroomoogan and Anshul Vikram Pandey.

ABOUT US

Accern.

«A data design startup that provides big data analytics solutions to companies to assist with intelligent data-driven decisions.»

Forbes
30 Under 30

IBM · CTC Chicago Trading Company · Walmart · Credit Suisse

Moody's · KPMG · Cognizant · Norges Bank

Macquarie · J.P.Morgan · NBCUniversal · InteractiveBrokers

Dow Jones Newswires · Tiger Global Management, LLC · Capital One · Deutsche Bank

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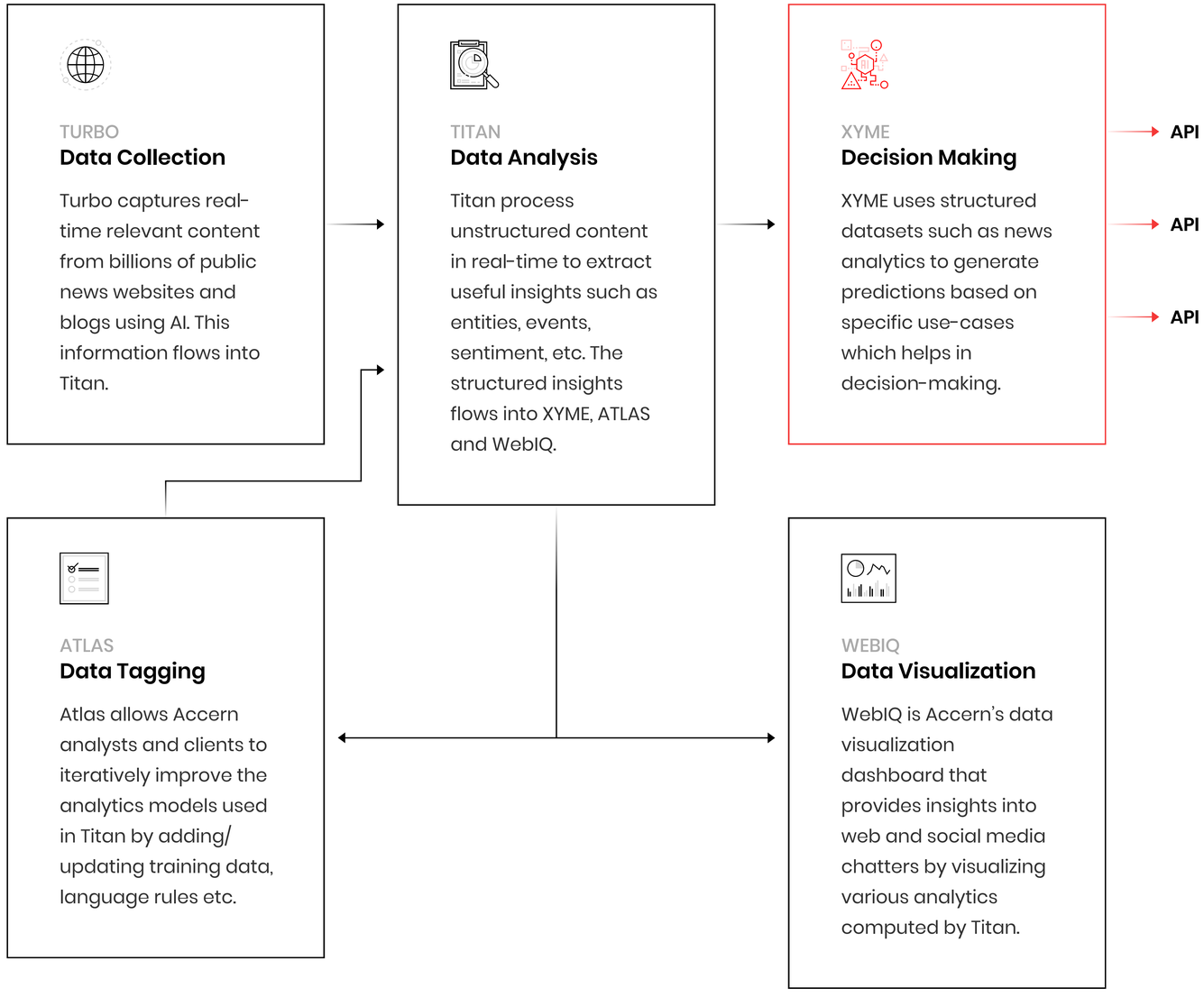
Below is the process of utilizing Accern's 5 engines to facilitate decision-making at firms.

PRODUCT OFFERING

Accern Ecosystem.

The core Accern ecosystem consists of Turbo, Titan, WebIQ and XYME working together to automate decision-making for many businesses. The systems can also work standalone to solve specific industry problems as well. Atlas provides the QA, tagging and feedback interface to improve models used in Titan, and can be deployed alongside Titan.



Data Scientist in an Asset Management Firm

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DATA LAKE

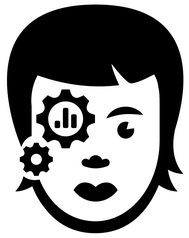
LOTS OF DATA FROM VARIOUS SOURCES

- Internal/external datasets
- Strong temporal aspect

TASK

FIND VALUE FOR A SPECIFIC USE-CASE

- Extremely low signal/noise ratio
- Strict regulatory requirements
- Use-case specific success criteria



No specialized framework available

Has to build AI capability in-house

Spends months and $$ to test data

XYME Overview

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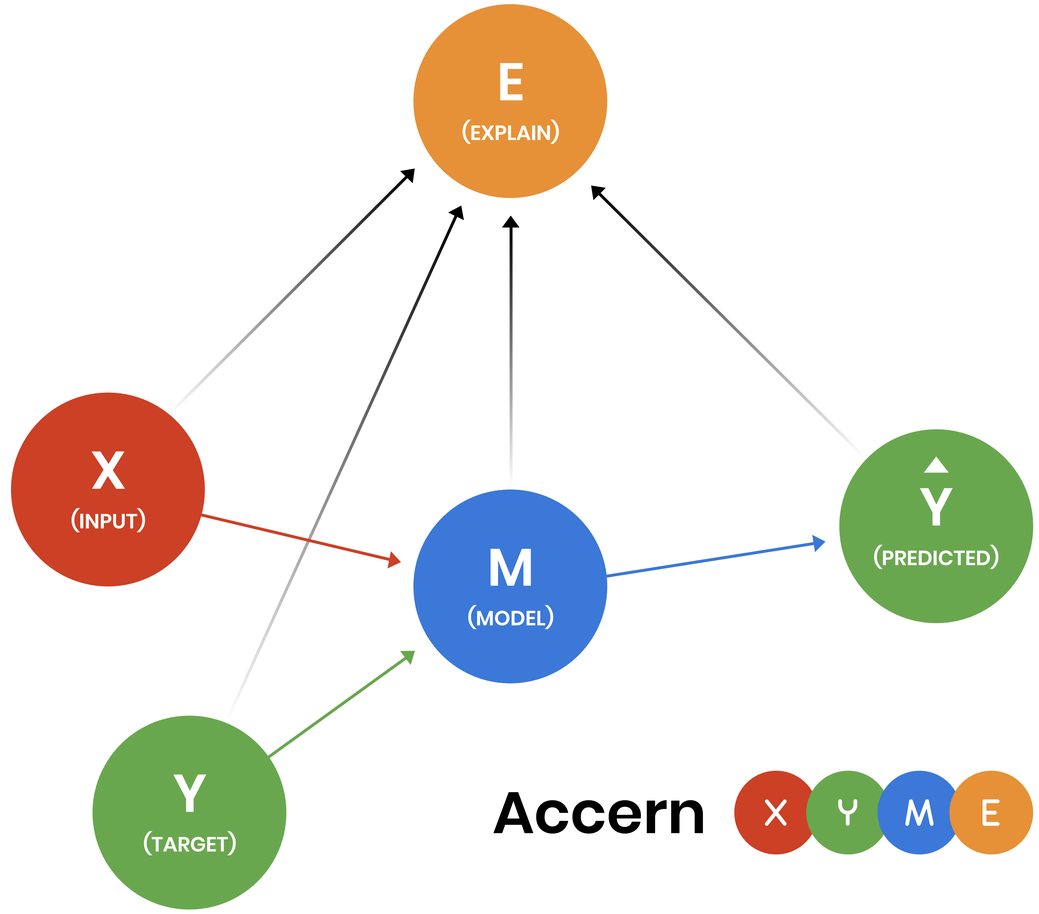
- Accern XYME - Predictive modeling framework.
- Built for **time-series forecasting** use-cases.
  (i.e., where random training/test split is discouraged)
- Supports **online-learning** and **walk-forward** predictions.
- In-built integration with popular **technical indicators**.
- Implements popular **ML models** and **ensembles**.
- Supports popular **ML libraries - TensorFlow, Keras, Caffe2** etc.
- Operates in **plug-and-play** and **driverless** modes.
- Provides **API** and **GUI** to train, test and evaluate models.
- **Fully-customizable!** -- you can extend it.



Steps to create a XYME job

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1

X - CONNECT ANY STRUCTURED DATASET(S).

E.g., price-volume, news analytics, satellite imagery, fundamental etc.

2

Y - CONNECT ANY TARGET DATASET, I.E., THE VALUE YOU WANT TO PREDICT.

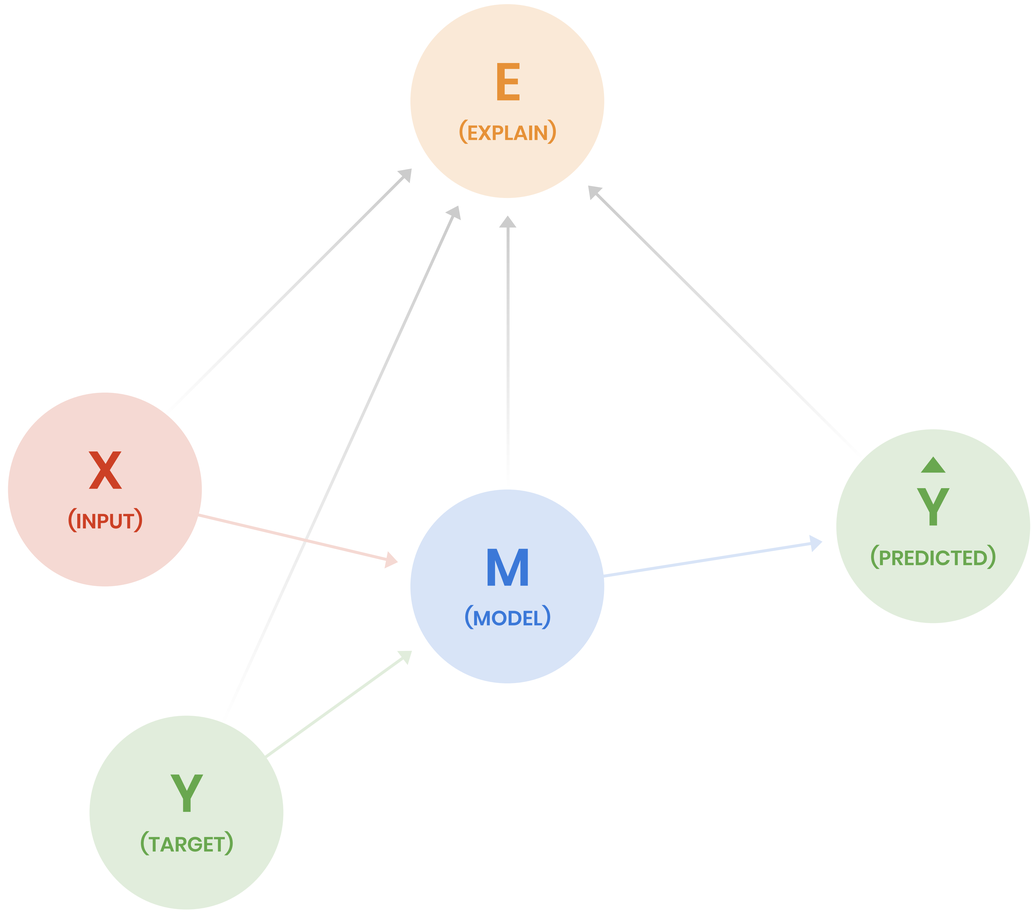
E.g., stock volatility, price-direction, operational metrics, KPIs etc.

3

M - DEFINE THE MODELS/PARAMETERS OR DRIVERLESS OPERATION MODE.

4

E - REVIEW THE EXPLANATIONS AND EVALUATION METRICS. REPEAT OR DEPLOY.



Batch Learning vs Online Learning

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BATCH LEARNING
(using multiple train/test splits)

Training Sample Test Sample

BATCH LEARNING
(using continuous train/test splits)

ONLINE LEARNING
(training/testing on-the-fly)

WHY ONLINE LEARNING?

- No overfitting
- No forward-looking bias
- Takes into account:
  - Cycles
  - Regime changes
  - Trends
  - Seasonality
- More out-of-sample data
- More robust

XYME vs Other Popular ML Tools

(key differentiation)

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	H2O.ai	DataRobot	XYME
General / Special Purpose ML	General	General	Special (Finance)
Online Learning, Streaming Data	✗	✗	✓
Market Data Integration (out-of-box)	✗	✗	✓
Financial Feature Engineering (out-of-box)	✗	✗	✓
Scalable with Big Data (10X TBs data)	✗	✗	✓
Backtests and Risk Factor Analysis	✗	✗	✓
Regulatory Requirements	✗	✗	●

XYME Job Template

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«**X**» : {
"**query**": to get the input data,
"**preprocess**": (optional) any transformations on input data
},

«**Y**» : {
"**query**": to get the target data,
"**merge_id**": keys to merge X and Y data
"**preprocess**": (optional) any transformations on target data,
"**target**": target variable (raw or transformed after preprocess) to learn
},

«**M**» : [
{ "**name**": name of the model,
"**config**": model parameters/configurations,
"**report**": what to include in the evaluation report
},
{ }, { }, ... list of models and parameters to test
]

XYME Job Example #1

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Using **Accern's news analytics and price-volume data** for Dow-30 companies to **predict daily open-open directional change** using **Tensorflow's Multilayer Perceptron** with custom parameters and generate a **detailed evaluation report.**

```
«X» : {
 "ID": "43c7c3f3-b2b0-43c0-af92-18b87fa3c416",
 "preprocess": {
    "stacking": {
      "num_days": 3
   }
 }
},

«Y» : {
 "merge_id": "entity_share_class_figi",
 "preprocess": {
    "has_prices": true,
    "interval": "daily",
    "shift": 1,
    "type": "open_open"
  },
  "target": "benchmark_return"
 }
},

«M» : [
 {
  "config": {
   "balance_y": true,
   "auto_cfg_method": "grid",
   "auto_cfg": {
      "layers_width": [10, 100],
      "layers_depth": [3, 8],
      "lr": [1e-9, 1e-5],
      "noise_x": [1e-5, 0],
      "dropout_keep_prob": [0.8, 1],
    },
    "parallel": false,
    "partial_fit_max_iter": 50,
    "random_state": 0,
    "recent_window": 100,
    "sample_size": 100,
    "sampling_method": "recent",
    "seed_max_iter": 200,
    "seed_size": 100,
    "threshold": 0.1
  },
  "name": "tf_mlp_clf_online",
  "report": {
  "detail": true
  }
 }
]
```

XYME Job Example #2

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Using **Accern's news analytics and price-volume data** for S&P 500 companies to **predict daily open-open change magnitude** using **Sklearn's Random Forest** with custom parameters and generate a **detailed evaluation report.**

```
«X» : {
 "ID": "43c7c3f3-b2b0-43c0-af92-18b87fa3c416",
 "preprocess": {
    "stacking": {
      "num_days": 3
   }
 }
},

«Y» : {
 "merge_id": "entity_share_class_figi",
 "preprocess": {
    "has_prices": true,
    "interval": "daily",
    "shift": 1,
    "type": "open_open"
  },
  "target": "magnitude_change"
 }
},

«M» : [
 {
   "config": {
      "balance_y": true,
      "id": "v0.8",
      "noise_x": 1e-05,
      "parallel": false,
      "partial_fit_max_iter": 50,
      "random_state": 0,
      "recent_window": 100,
      "sample_size": 100,
      "sampling_method": "recent",
      "seed_max_iter": 100,
      "seed_size": 100,
     "threshold": 1,
   },
   "name": "randomforest_clf_online",
   "report": {
      "detail": true
   }
 }
]
```

Success Stories

(products developed using XYME)

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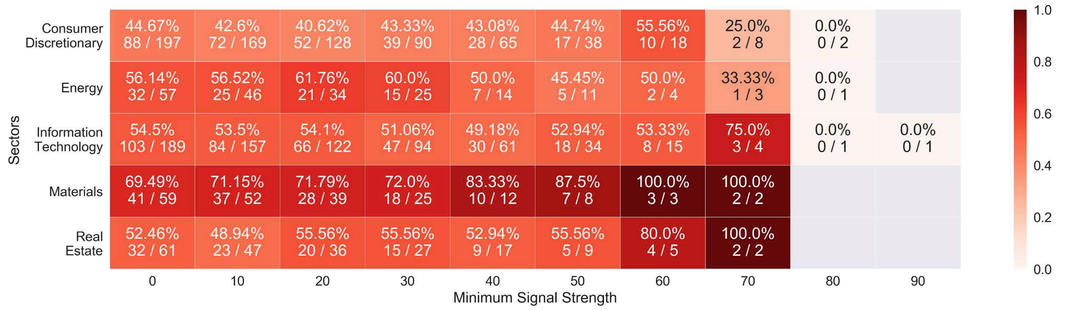
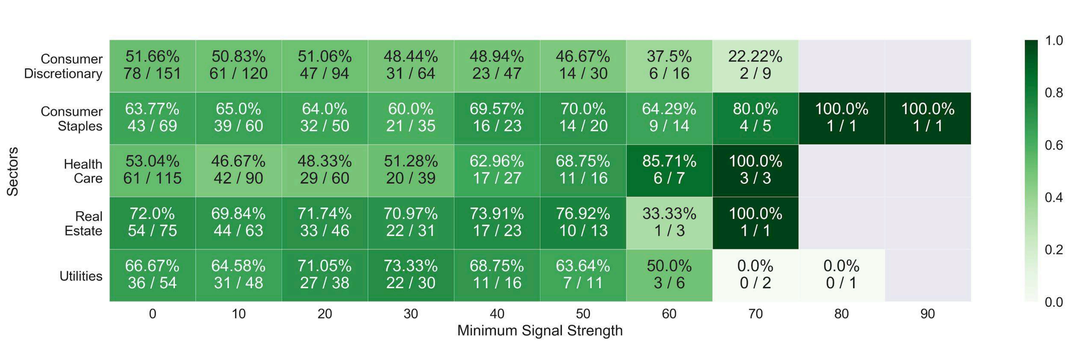
	BLACKSCOPE	FUNDAMENTAL ALPHA
What it is	Predicts daily stock price-direction for S&P 500 constituents at 9:20AM EST.	Predicts quarterly 'comps' for top 50 consumer retail companies 7 days before the announcement.
Input (X)	+ Price-volume data + Daily aggregated **Accern News Analytics data**	+ Wall Street Consensus data + Quarterly aggregated **Accern News Analytics data**
Target (Y)	+ Open-Open price-direction movement	+ Reported comparable store-sales
Model (M)	+ Ensemble using 500 classification models/ticker.	+ Ensemble using 18 regression models.
Eval. (E)	+ Consistently performs at **55%+ accuracy** on high-confidence signals. + Does not contain any bullish bias.	+ Live predictions outperforming Wall Street consensus with **75%+ accuracy**. + Historically outperformed Wall Street consensus.

BLACKSCOPE

60% Strong Buy Signal Accuracy for Top 5 Performing Sectors

52% Strong Sell Signal Accuracy for Top 5 Performing Sectors





x-axis:
signal strength which can be set | y-axis: sectors.

gradient:
a darker shade of red/green signifies a higher sell/buy accuracy rate, respectively.

values:
values in the box signify the overall accuracy percentage and correct/total predictions.

Live Performances

FUNDAMENTAL ALPHA

(current earnings season)

75% Predicting Comps with Lower Error than Wall Street.

Pred. Date	Report Date	Ticker	Consensus	Accern	Reported	Accuracy
7/12/2018	7/19/2018	SKX	3.60%	**4.50%**	4.50%	CORRECT
7/18/2018	7/25/2018	ORLY	3.10%	**4.27%**	4.60%	CORRECT
7/19/2018	7/26/2018	AAN	-3.50%	**-3.86%**	-1.80%	INCORRECT
7/19/2018	7/26/2018	CRI	-0.90%	**-0.31%**	0.90%	CORRECT
7/19/2018	7/26/2018	DNKN	0.80%	**1.48%**	1.00%	CORRECT
7/19/2018	7/26/2018	MNRO	1.40%	**1.94%**	1.90%	CORRECT
7/19/2018	7/26/2018	TSCO	3.30%	**4.11%**	5.60%	CORRECT
7/23/2018	7/30/2018	RCII	2.80%	**3.34%**	3.70%	CORRECT
7/24/2018	7/31/2018	LL	2.80%	**3.48%**	4.70%	CORRECT
7/24/2018	7/31/2018	RL	-0.20%	**0.70%**	-0.90%	INCORRECT
7/25/2018	8/1/2018	AN	2.40%	**1.37%**	4.00%	INCORRECT
7/25/2018	8/1/2018	HABT	-0.40%	**-0.01%**	1.20%	CORRECT
7/26/2018	8/2/2018	BOJA	-0.50%	**-0.29%**	-0.20%	CORRECT
7/26/2018	8/2/2018	SFM	2.10%	**2.53%**	2.00%	INCORRECT
7/26/2018	8/2/2018	SHAK	0.90%	**1.10%**	1.10%	CORRECT
7/31/2018	8/7/2018	PBPB	-0.10%	**-0.40%**	-0.20%	CORRECT
7/31/2018	8/7/2018	PZZA	-5.10%	**-5.43%**	-6.10%	CORRECT
8/1/2018	8/8/2018	CVS	5.30%	**5.53%**	5.90%	CORRECT
8/1/2018	8/8/2018	JACK	0.50%	**-0.28%**	0.50%	INCORRECT
8/2/2018	8/9/2018	CHUY	1.40%	**0.97%**	1.00%	CORRECT
8/72018	8/14/2018	HD	6.50%	**6.83%**	8.00%	CORRECT
8/9/2018	8/16/2018	JCP	1.00%	**1.37%**	0.30%	INCORRECT
8/9/2018	8/16/2018	JWN	1.10%	**1.80%**	4.00%	CORRECT
8/9/2018	8/16/2018	WMT	2.20%	**2.64%**	4.60%	CORRECT

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Success Stories

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O'REILLY®

Artificial Intelligence
CONFERENCE

Top-10 AI Startups

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San Francisco / September 4-7, 2018

Accern XYME is proud to be recognized as one of the **top-10 pioneering AI software** by the **Artificial Intelligence Conference**, organized by **O'Reilly** and **Intel AI.**

Find us at:
Grand Ballroom A, Hilton Union Square, San Francisco

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XYME

XYME is Accern's predictive modeling framework used to train, test, analyze and deploy predictive models utilizing any dataset, primarily for financial market use-cases. XYME is the driving force behind all of Accern's predictive analytics products that you depend on and trust.

Request early access:
info@accern.com

How can we help?

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Mining for Alpha in Datasets

Asset management firms spend hundreds of hours in understanding and evaluating internal and external/ alternative datasets. XYME can help in finding value in such datasets for various use-cases.

Model Evaluation/Explanation

Financial institutions are trying to use more advanced machine-learning models in their existing workflows. XYME provides them the ability to understand and explain why certain predictions are made by the models.

KPI Modeling and Signal Generation

Asset management firms are very interested in models that can provide reliable predictions for various various KPIs and stocks. BlackScope and Fundamental Alpha are examples of two such cases.

Generate Investment Thesis

XYME can aggregate multiple datasets and identify whether different features, across datasets, share dependencies. Analysts can use this information to generate new investment thesis.