SIGOPT

AMPLIFY YOUR RESEARCH

A Very Short History of Machine Learning

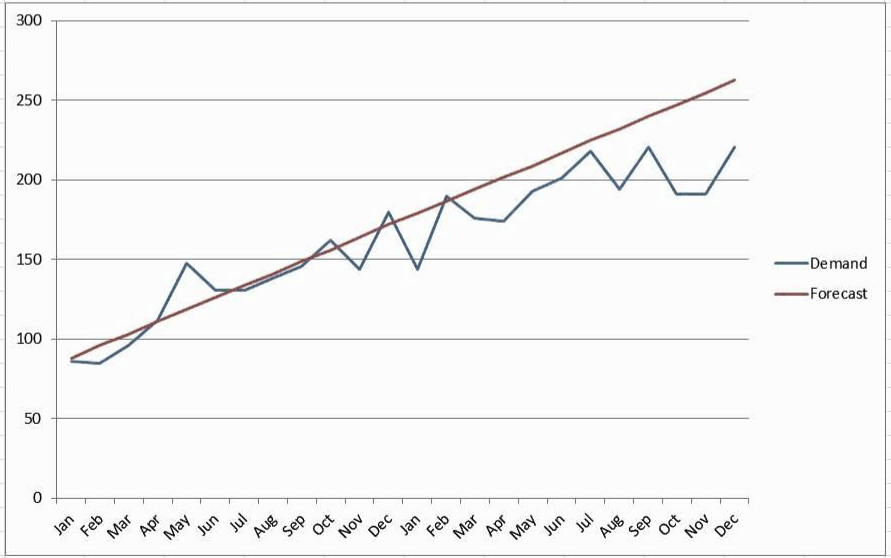
What can we do with 1,000 data points?

Forecasting Methods for non-stationary data - Microsoft Excel

Period	Month	Demand	Forecast	Error	ABS Error	% Error	Sq. Error	U-Stat
1	Jan	86	88					
2	Feb	85	96					
3	Mar	96	103					
4	Apr	112	111					
5	May	148	119					
6	Jun	131	126					
7	Jul	131	134					
8	Aug	138	141					
9	Sep	146	149					
10	Oct	162	156					
11	Nov	144	164					
12	Dec	180	172					
13	Jan	144	179					
14	Feb	190	187					
15	Mar	176	194					
16	Apr	174	202					
17	May	193	209					
18	Jun	201	217					
19	Jul	218	225					
20	Aug	194	232					
21	Sep	221	240					
22	Oct	191	247					
23	Nov	191	255					
24	Dec	221	263					

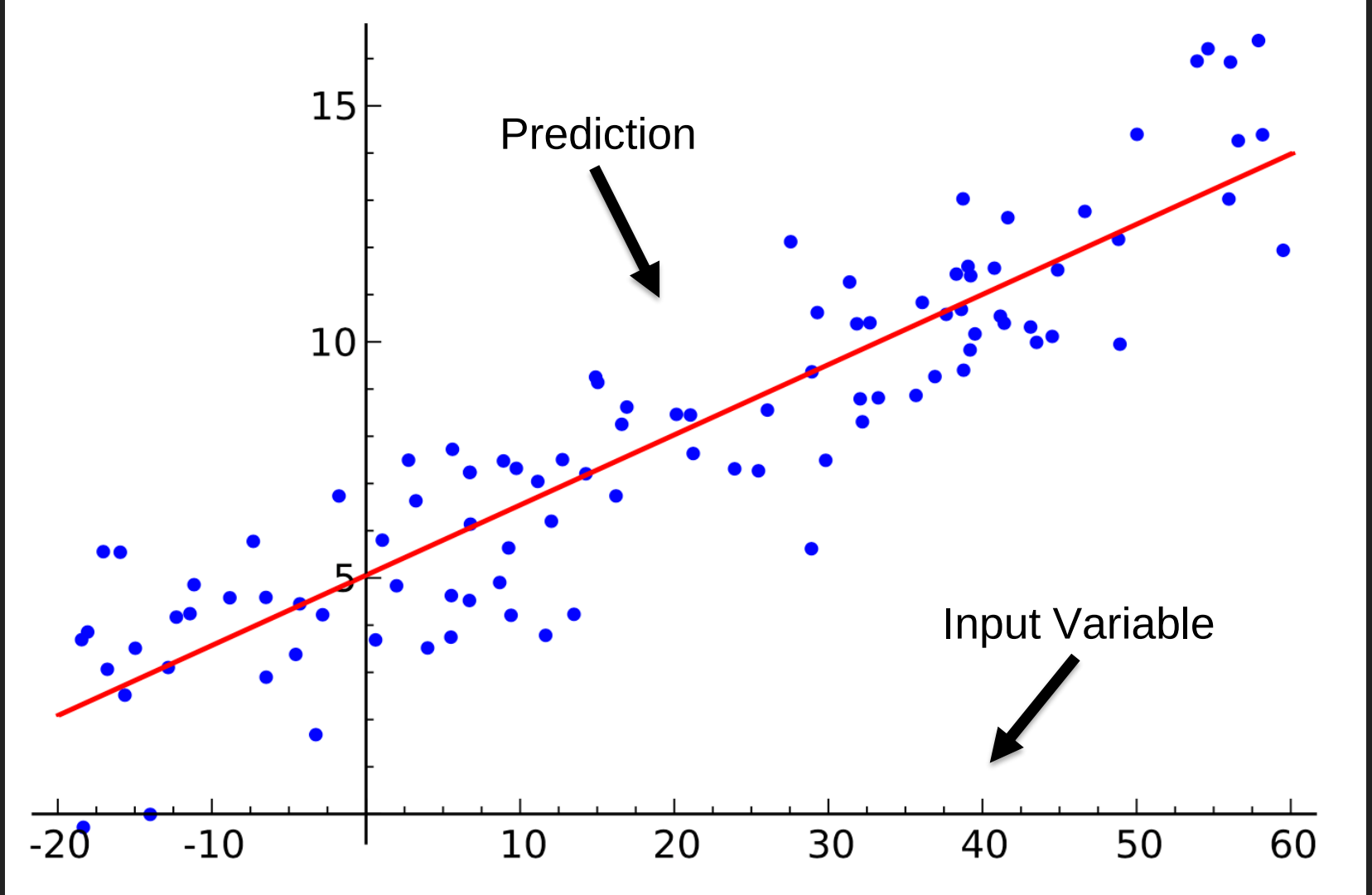
ME:	
MAE:	
MAPE:	
MSE:	
U-Stat:	

Intercept:	80.667
Slope:	7.577

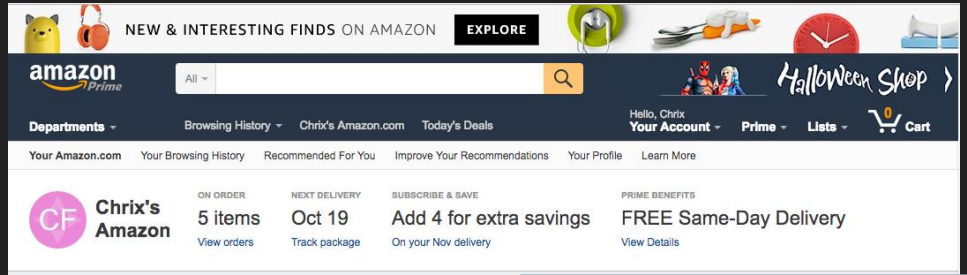


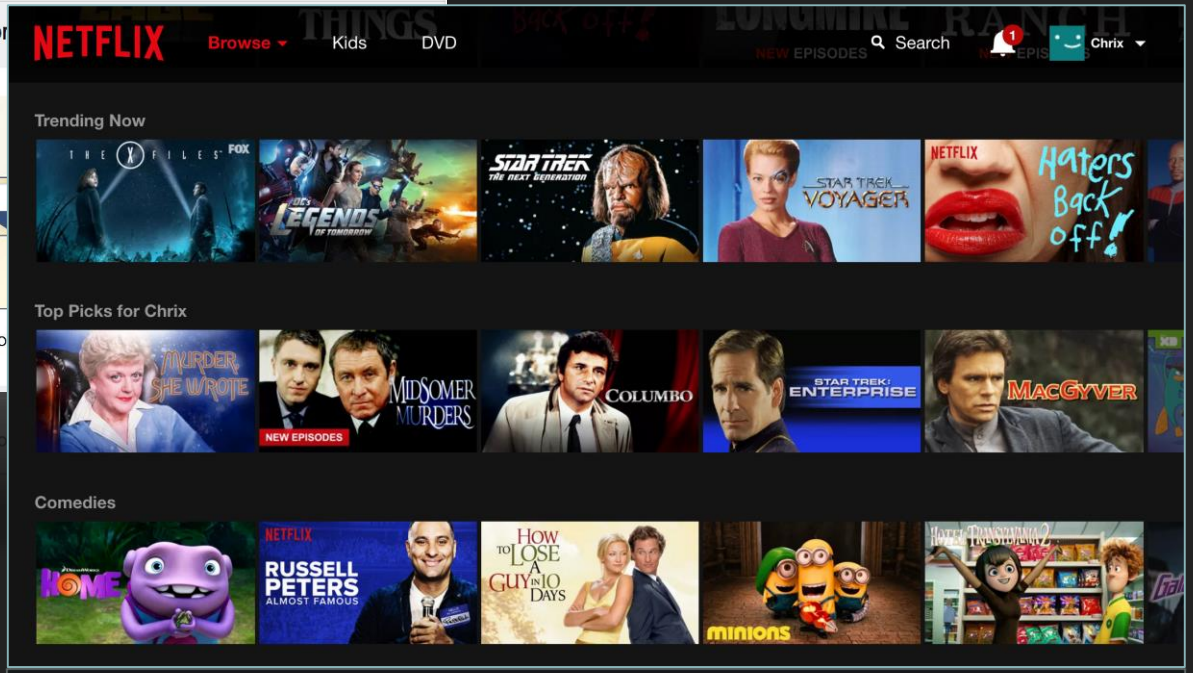
Regression | Exp Smooth | Holt | Winter | Holt-Winter

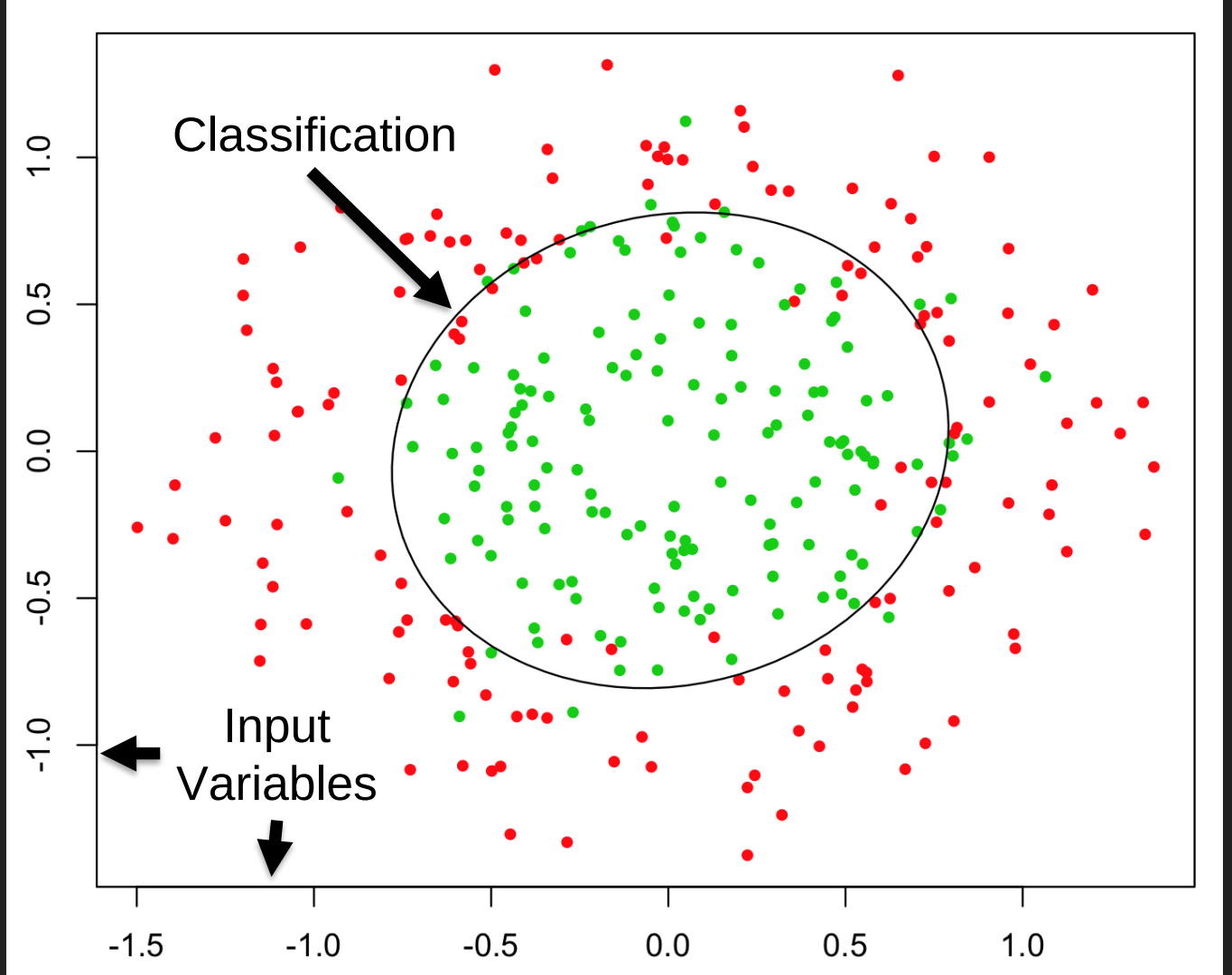
Ready


Prediction
Input Variable
15
10
5
-20
-10
10
20
30
40
50
60

What can we do with 1,000,000 data points?


NEW & INTERESTING FINDS ON AMAZON
EXPLORE
amazon Prime
All
Halloween Shop
Departments
Browsing History
Chrix's Amazon.com
Today's Deals
Hello, Chrix
Your Account
Prime
Lists
Cart
Your Amazon.com
Your Browsing History
Recommended For You
Improve Your Recommendations
Your Profile
Learn More
CF
Chrix's Amazon
ON ORDER
5 items
View orders
NEXT DELIVERY
Oct 19
Track package
SUBSCRIBE & SAVE
Add 4 for extra savings
On your Nov delivery
PRIME BENEFITS
FREE Same-Day Delivery
View Details
Recommended for
Natural Ice
Buy It Again in Health and Personal Care
4 ITEMS
Buy It Again in O
3 ITEMS


NETFLIX
Browse
Kids
DVD
Search
Chrix
Trending Now
THE X FILES
FOX
DC's LEGENDS OF TOMORROW
STAR TREK THE NEXT GENERATION
STAR TREK VOYAGER
NETFLIX
Haters Back Off!
Top Picks for Chrix
MURDER SHE WROTE
MIDSOMER MURDERS
NEW EPISODES
COLUMBO
STAR TREK: ENTERPRISE
MACGYVER
Comedies
HOME
NETFLIX
RUSSELL PETERS
ALMOST FAMOUS
HOW TO LOSE A GUY IN 10 DAYS
MINIONS


Classification
Input
Variables
1.0
0.5
0.0
-0.5
-1.0
-1.5
-1.0
-0.5
0.0
0.5
1.0

What can we do with 1,000,000,000 data points?

cats

Nov 1, 2015

Oct 29, 2015

Dec 26, 2005

golden gate bridge

May 20

selfies

Yesterday

Oct 10

Oct 2

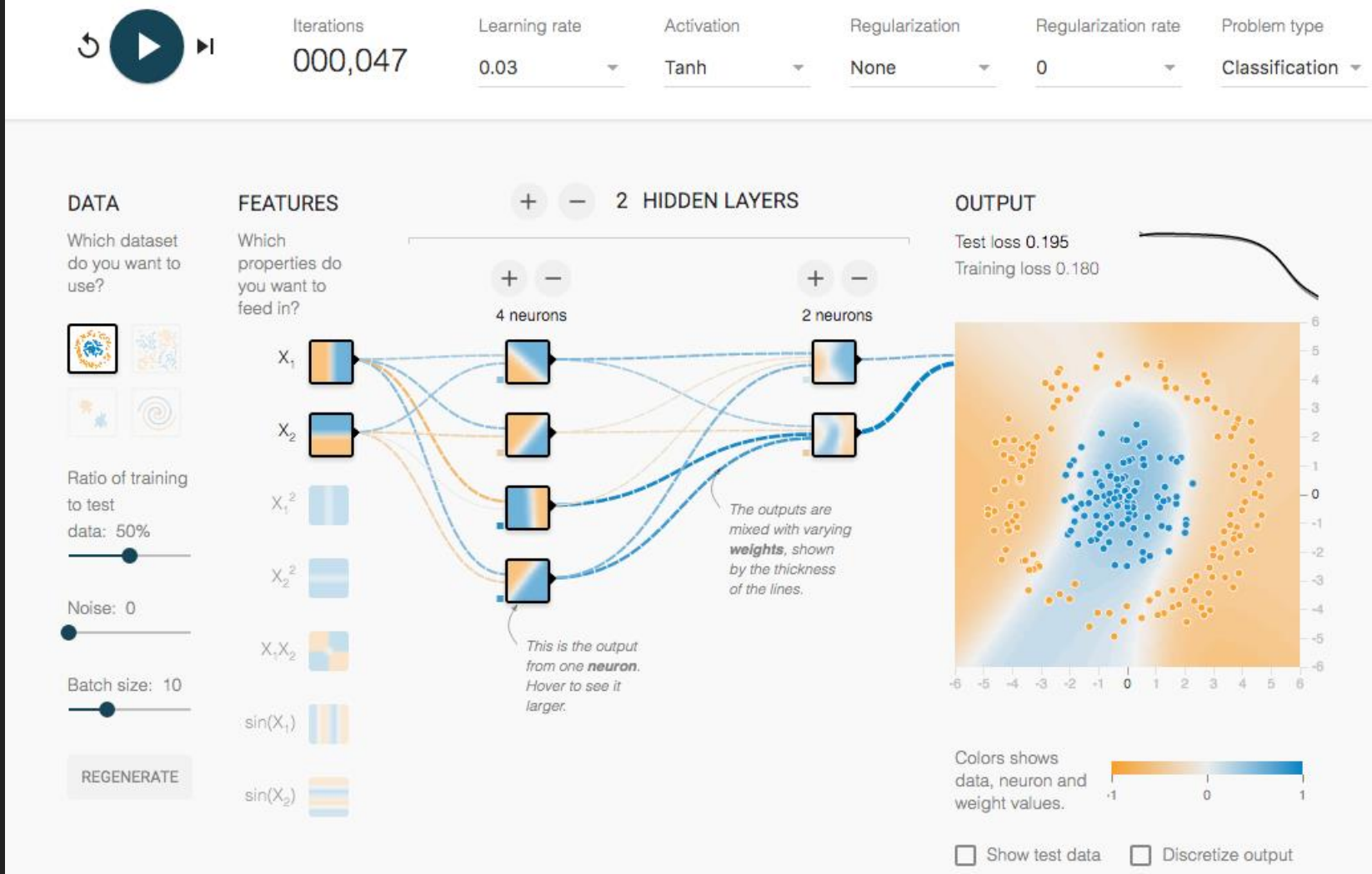
Oct 1

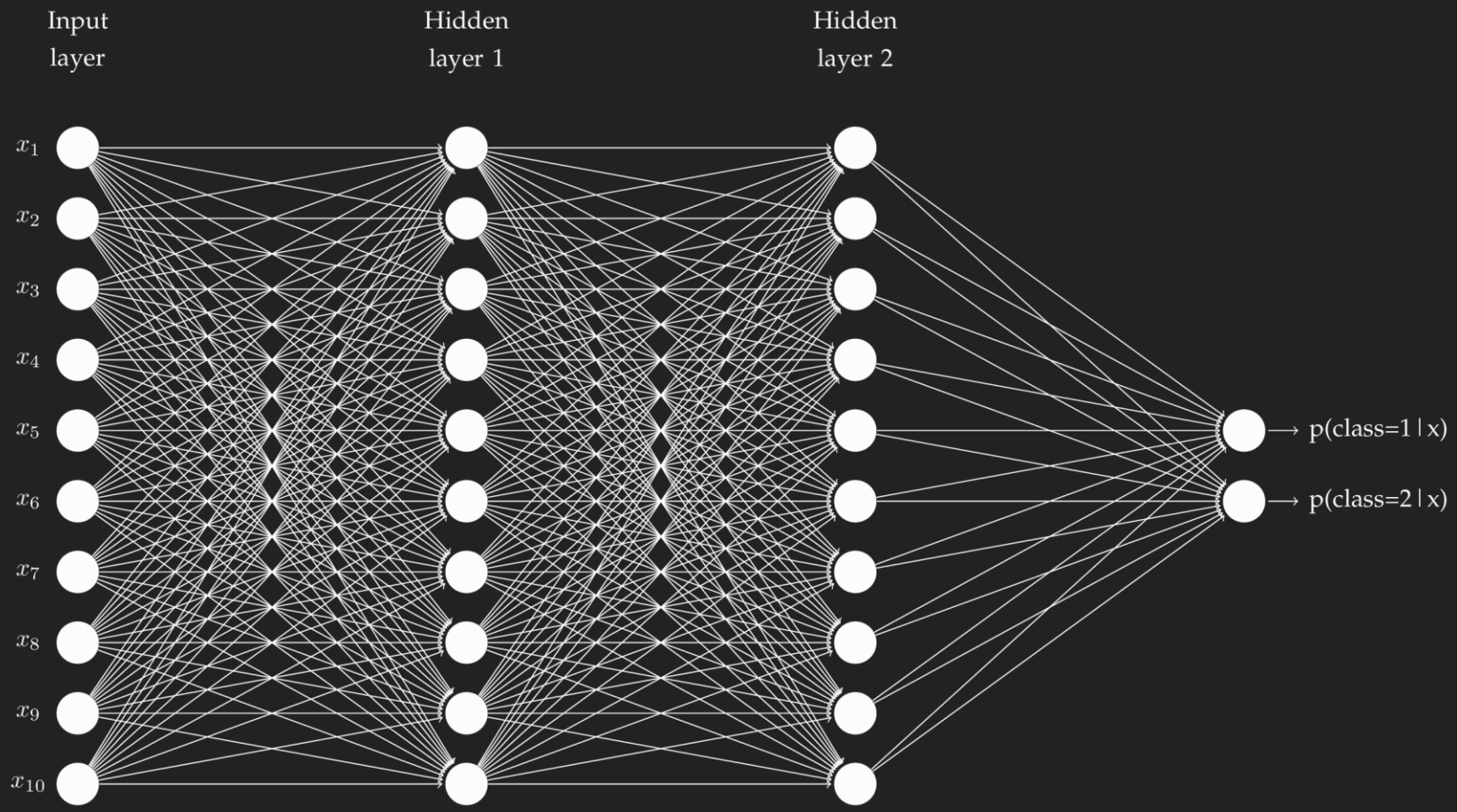
Sep 18

Aug 27

Aug 26

Aug 25


Iterations
000,047
Learning rate
0.03
Activation
Tanh
Regularization
None
Regularization rate
0
Problem type
Classification
DATA
Which dataset do you want to use?
Ratio of training to test data: 50%
Noise: 0
Batch size: 10
REGENERATE
FEATURES
Which properties do you want to feed in?
X1
X2
X1²
X2²
X1X2
sin(X1)
sin(X2)
2 HIDDEN LAYERS
4 neurons
2 neurons
The outputs are mixed with varying weights, shown by the thickness of the lines.
This is the output from one neuron. Hover to see it larger.
OUTPUT
Test loss 0.195
Training loss 0.180
Colors shows data, neuron and weight values.
-1
0
1
Show test data
Discretize output


Input layer
Hidden layer 1
Hidden layer 2
x_1
x_2
x_3
x_4
x_5
x_6
x_7
x_8
x_9
x_{10}
p(class=1 | x)
p(class=2 | x)

Google DeepMind
Challenge Match
8 - 15 March 2016
AlphaGo
AlphaGo
Lee Sedol
Google DeepMind
Challenge Match
8 - 15 March 2016

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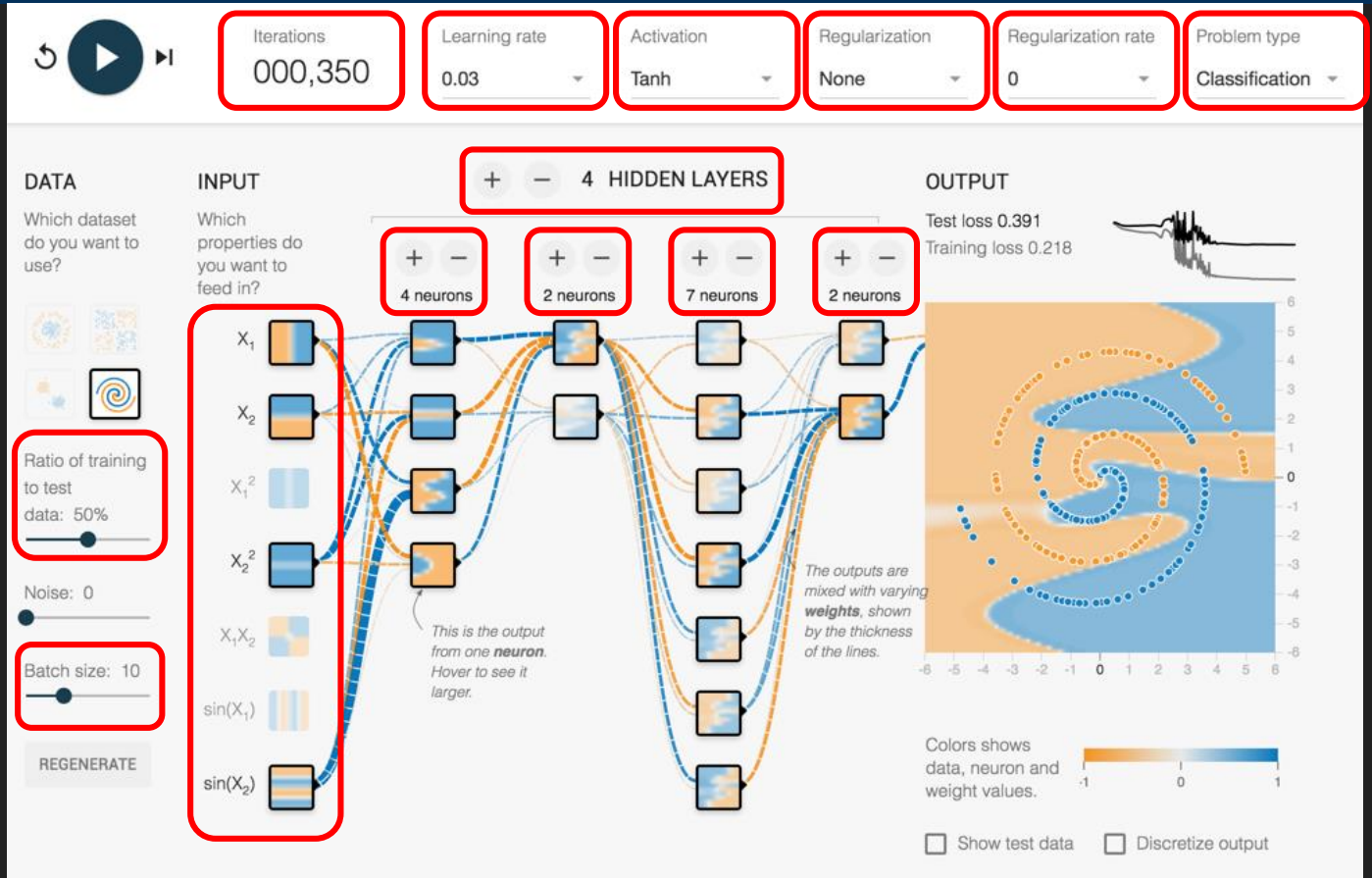
PLATFORM OVERVIEW

TUNABLE PARAMETERS IN DEEP LEARNING



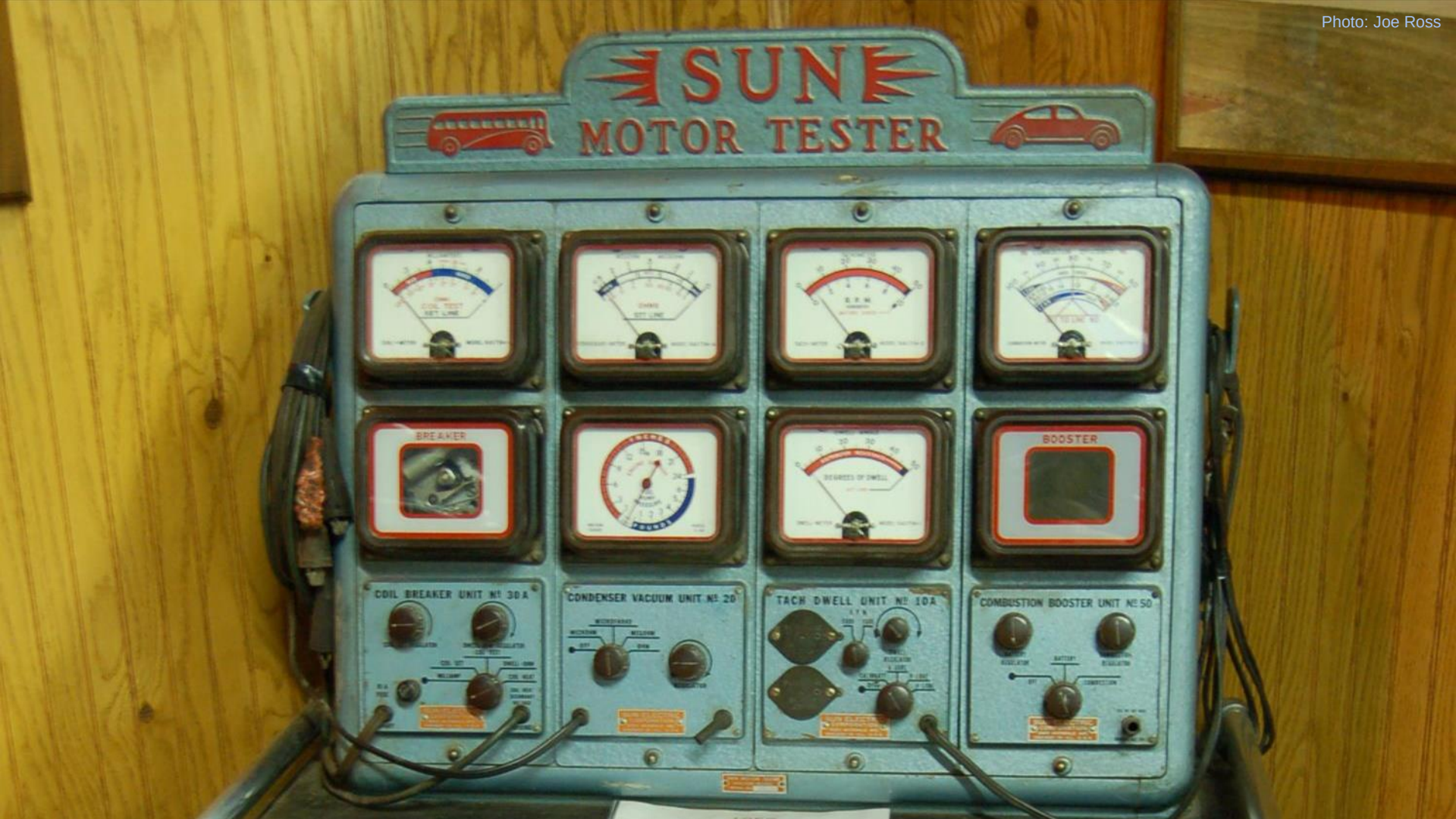


Photo: Joe Ross

HOW DO WE INTEGRATE?

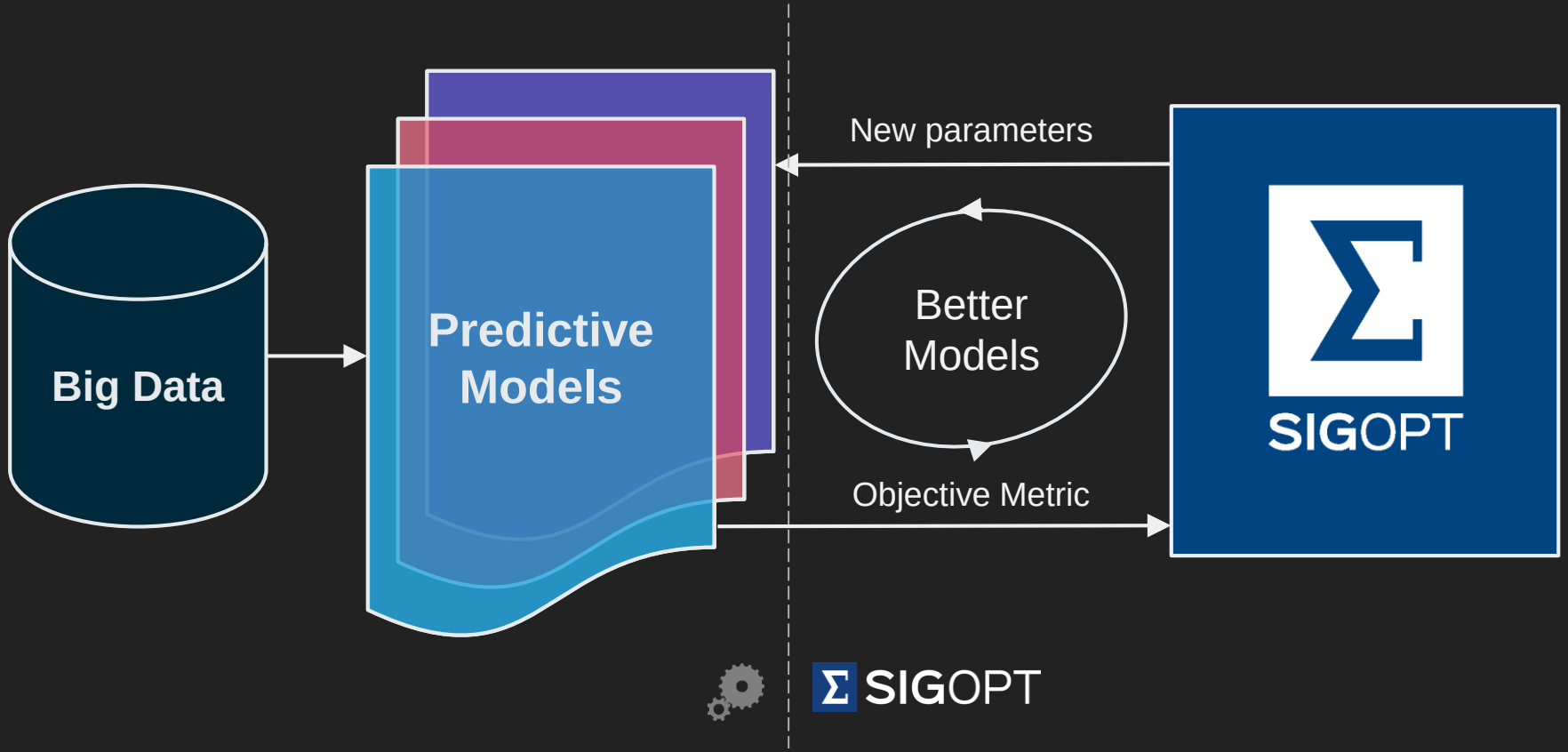
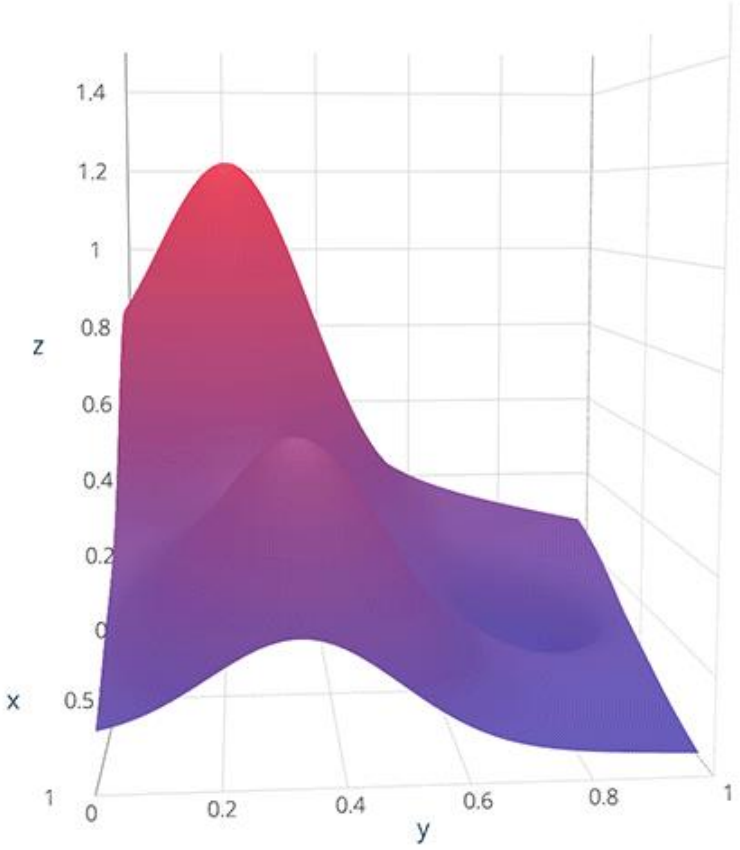


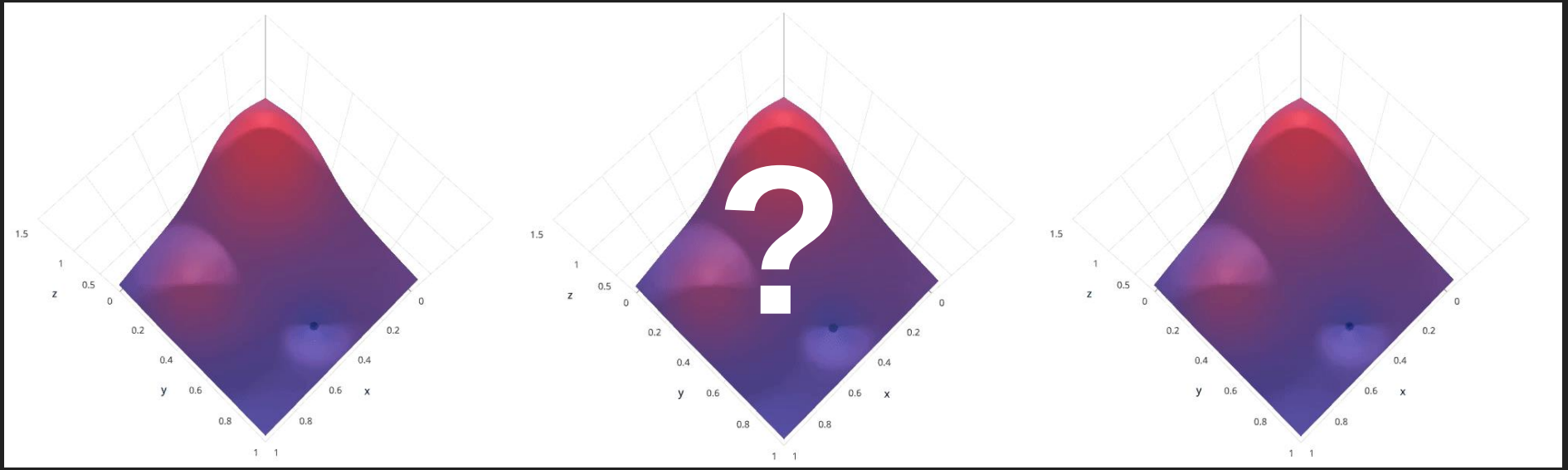
Photo: Tammy Strobel


1.4
1.2
1
0.8
z
0.6
0.4
0.2
0
x
0.5
1
0
0.2
0.4
0.6
0.8
1
y

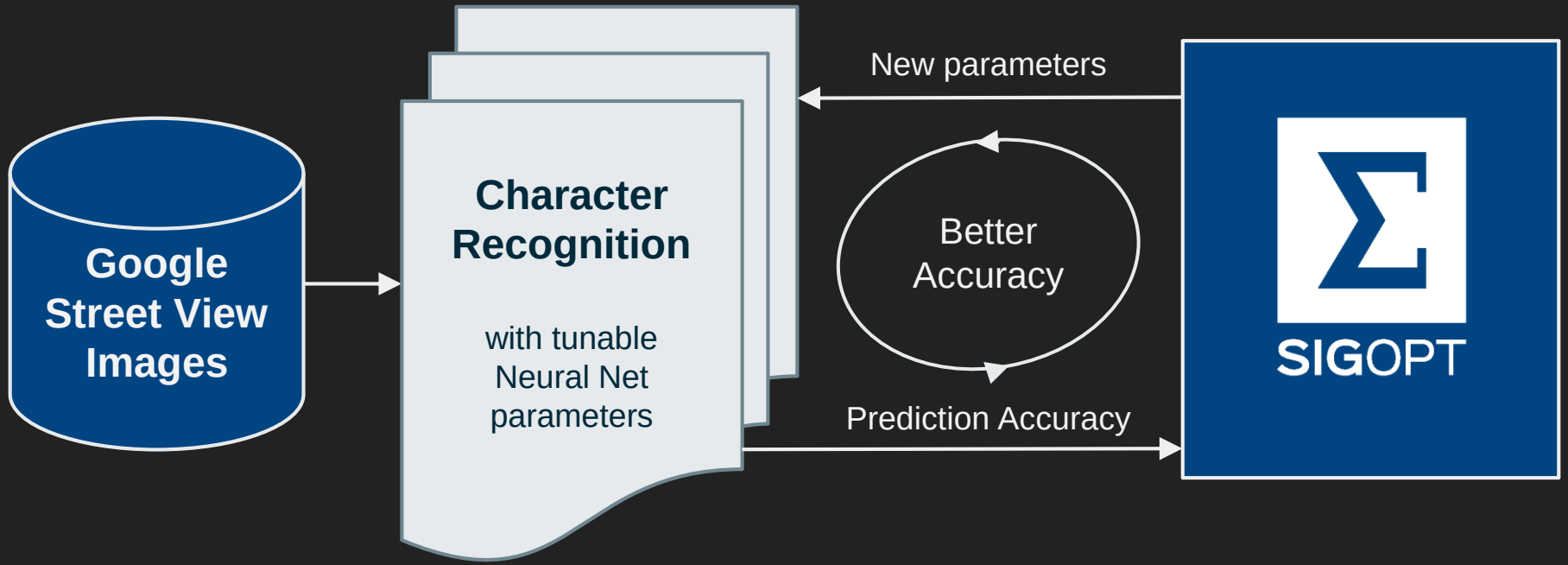
Grid Search

Random Search

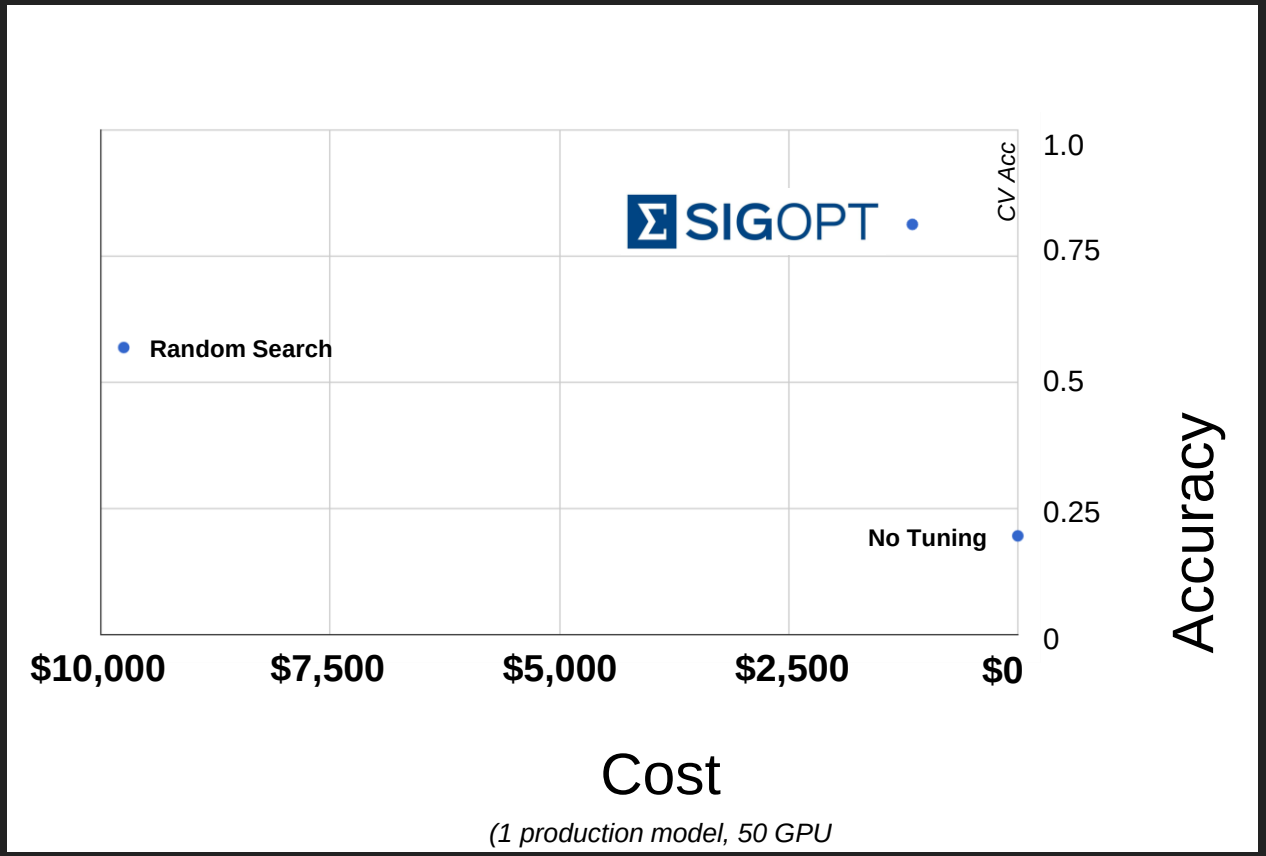
SIGOPT



EXAMPLE: IMAGE RECOGNITION

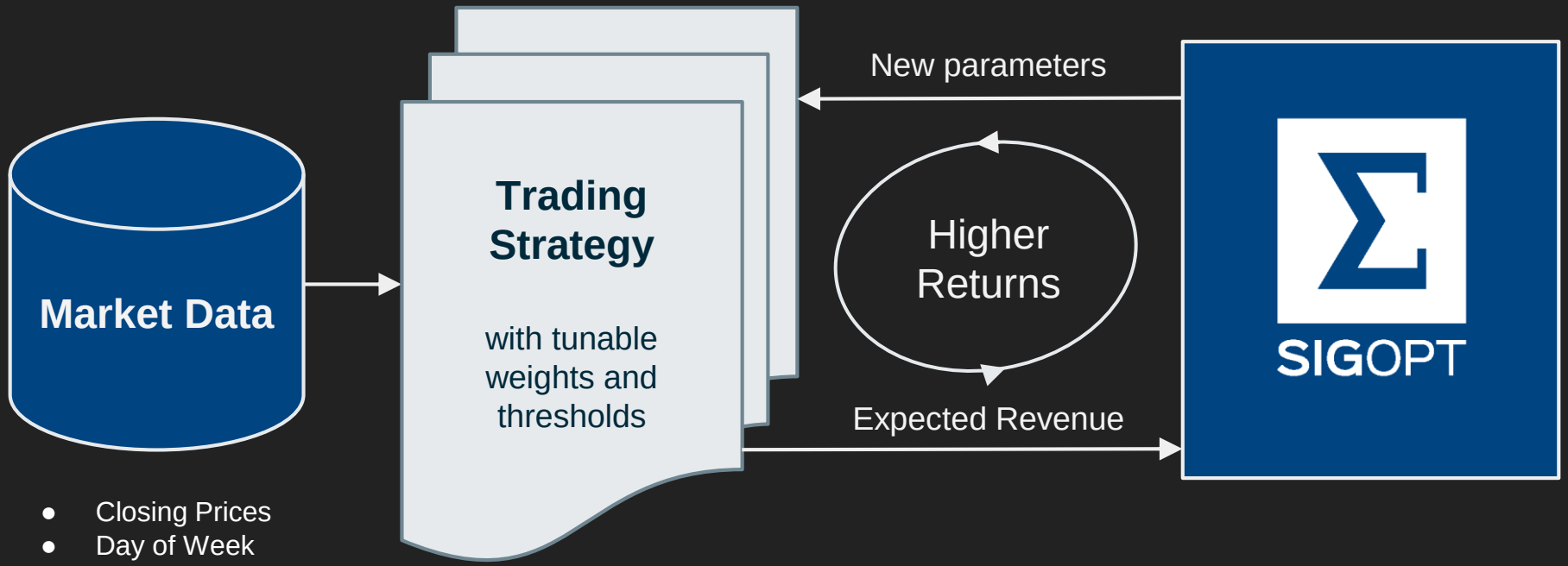


COMPARATIVE PERFORMANCE



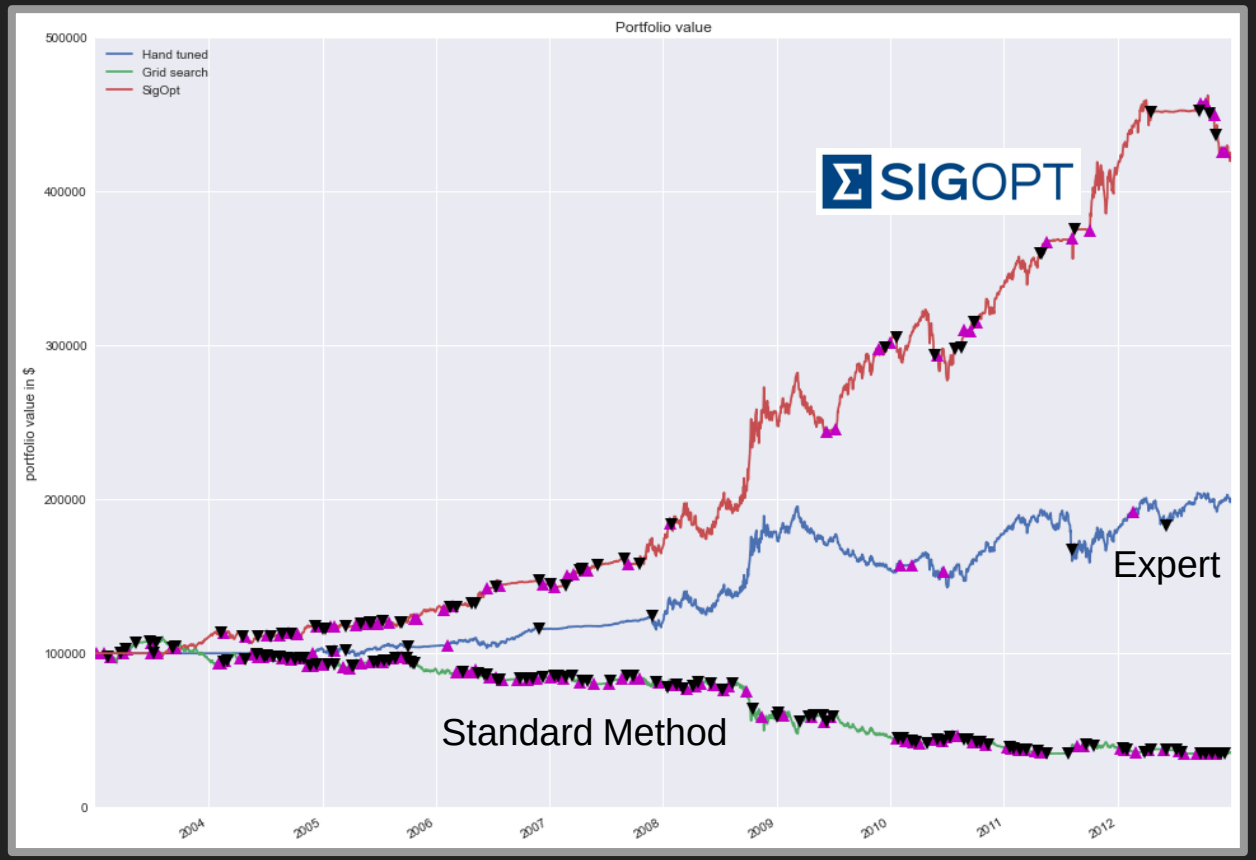
- 315% better accuracy than baseline
- 88% cheaper than standard tuning methods

EXAMPLE: ALGORITHMIC TRADING



- Closing Prices
- Day of Week
- Market Volatility

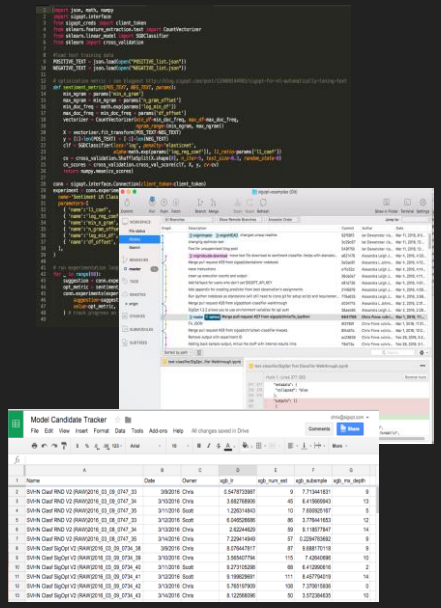
COMPARATIVE PERFORMANCE



- **Better:** 200% Higher model returns than expert
- **Faster/Cheaper:** 10x faster than standard methods

SIMPLIFIED MANAGEMENT

Before SigOpt



SIGOPT | My Experiments | My Profile | Documentation | Admin | Log out

XGBoost Classifier

View Results
Add Data
Properties
Suggestions
History
Client Admin

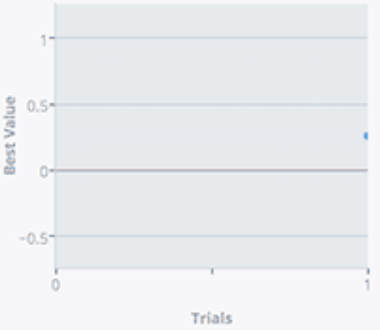
IMPROVEMENT
+0.0%

BEST VALUE
0.26
After 1 observations

CURRENT BEST PARAMETERS

Parameter	Optimal Value
xgb_subsmple	0.9705943610167523
xgb_mx_depth	14
xgb_num_est	121
xgb_lr	-3.291532934822611

OVERVIEW
Progress | History | 3D



Share Results
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