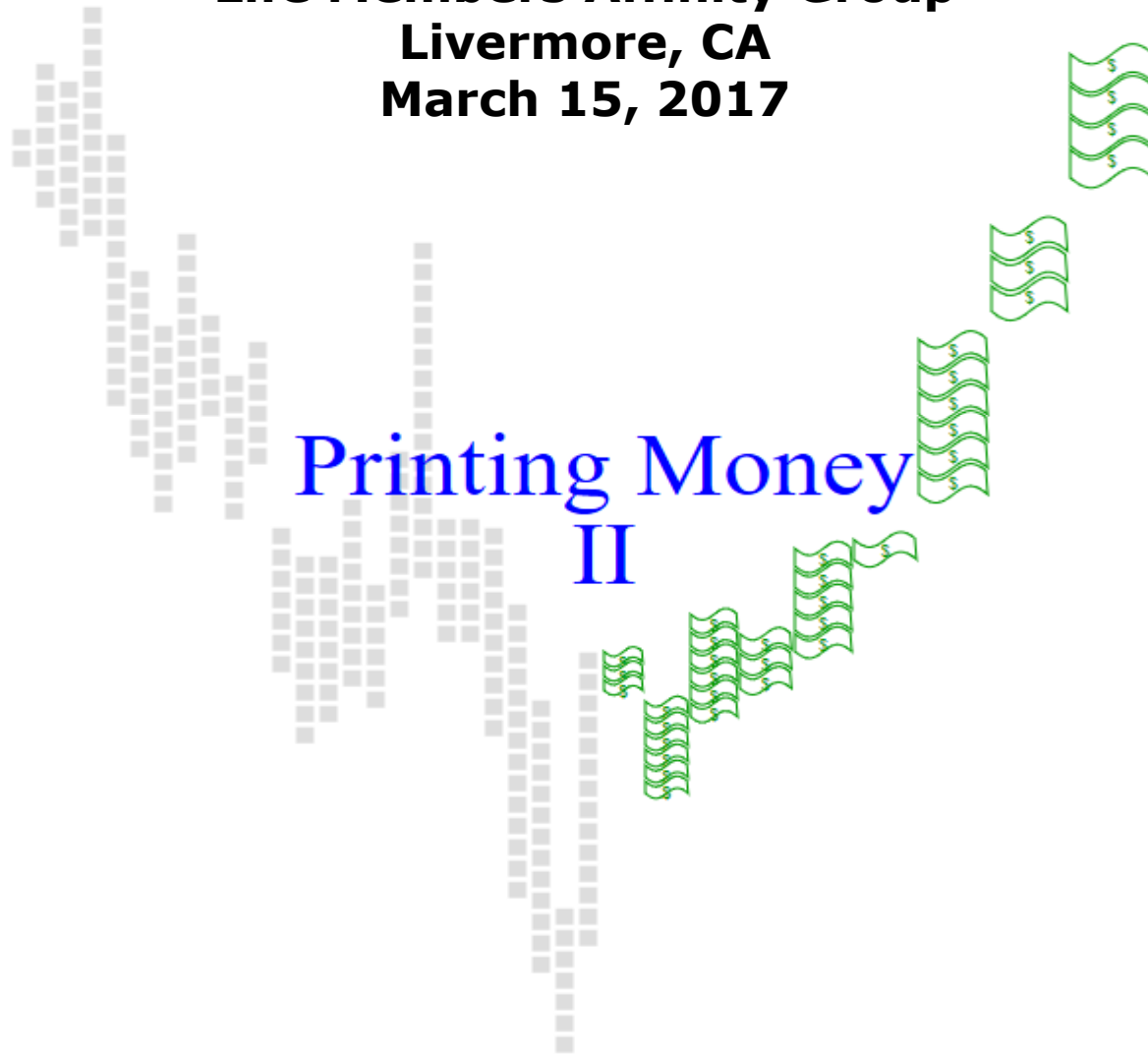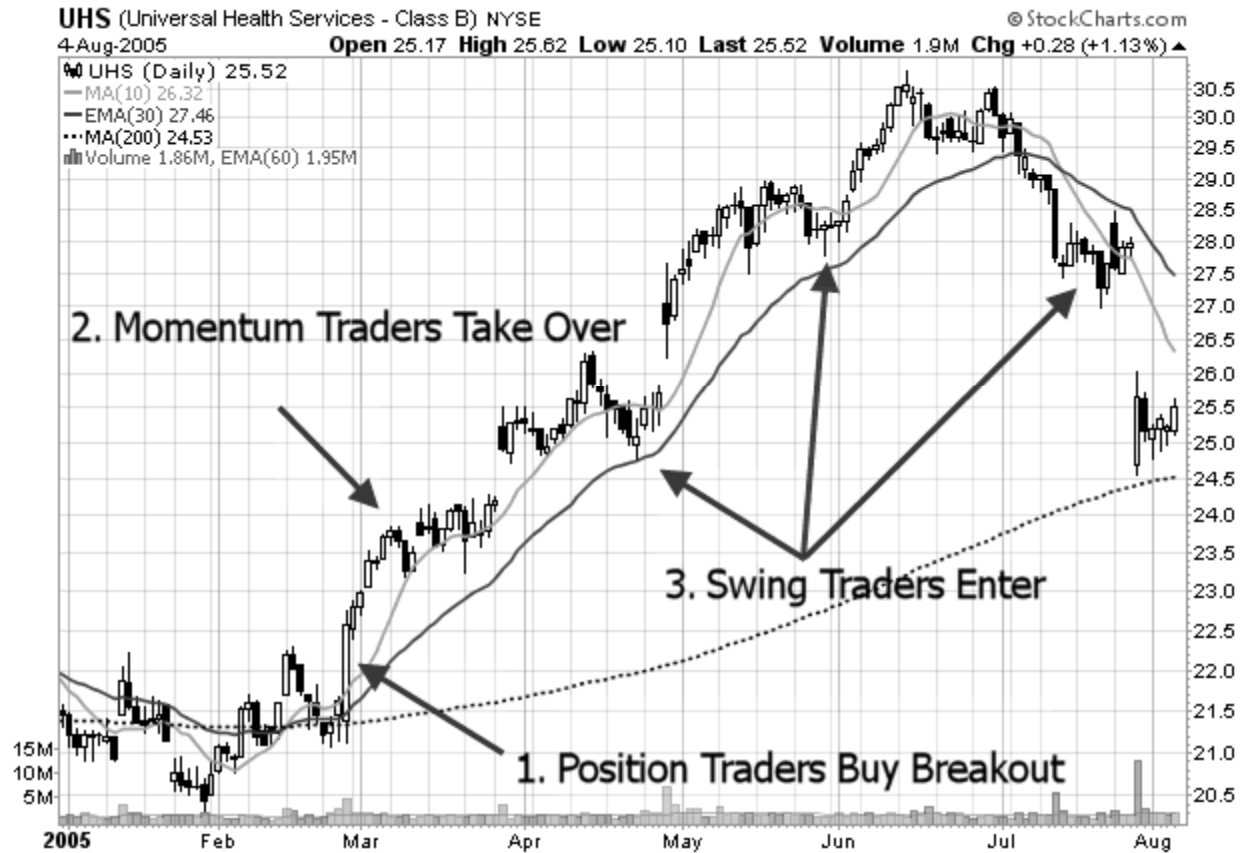**Presented to**
IEEE Oakland/East Bay
Life Members Affinity Group
Livermore, CA
March 15, 2017

# Printing Money
II

Types Of Traders

Process

- Find a new algorithm (books, experts, etc.)
- Determine the filters for the algorithms
- Tune the filters using Genetic Algorithms
- Score the algorithm using Genetic Algorithms
- Run all algorithms each night
- Review using Intraday data
- Buy or not

Typical Algorithm – New High

- Look for stocks making new highs.
- Minimum Money Flow (Price*Volume) 600000
- Daily Volume greater or equal to 100k shares.
- Daily Close greater or equal to $2.00.
- Volume Ratio of last 3 days over previous 20 days >= 2.1
- Price gain of Current Day / Day-5 >= 8%
- New High in the last 200 days
- Not a previous High in the last 200 days
- 3 Sets of 40 Day Moving Averages up by 1.0%.
- Skip the stock if there are any 2.0% Gap Up days in the last 3 days.
- Skip any RSI(13) over 0.82.
- No missing reported days in the last 7 days.
- Close to Close within 0.3% over the last 120 days

Genetic Algorithm
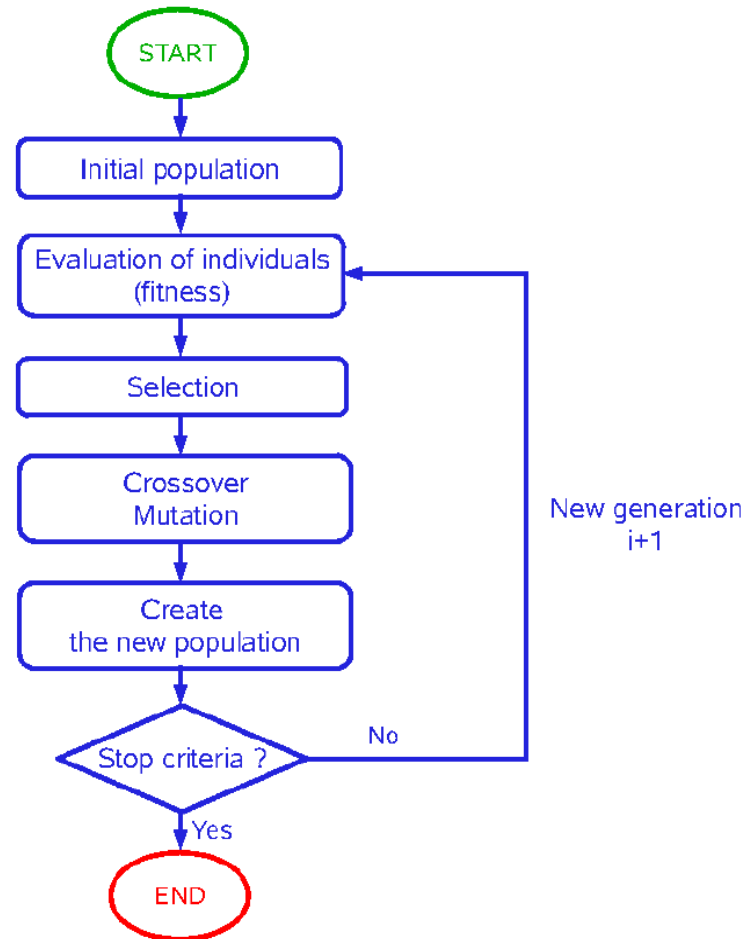
Encoding Individuals

Each individual is encoded with a random value for each variable and a large number of individuals are created (~10,000).

Individual (chromosome)

Volume (50k, 1000k, 50k)	Price ($1, $20, $1)	New High (60, 240, 20)

Individual #1

Volume 50k	Price $3	New High 80

Individual #2

Volume 250k	Price $8	New High 120

Selection

More 'fit' individuals have a higher probability of being selected.
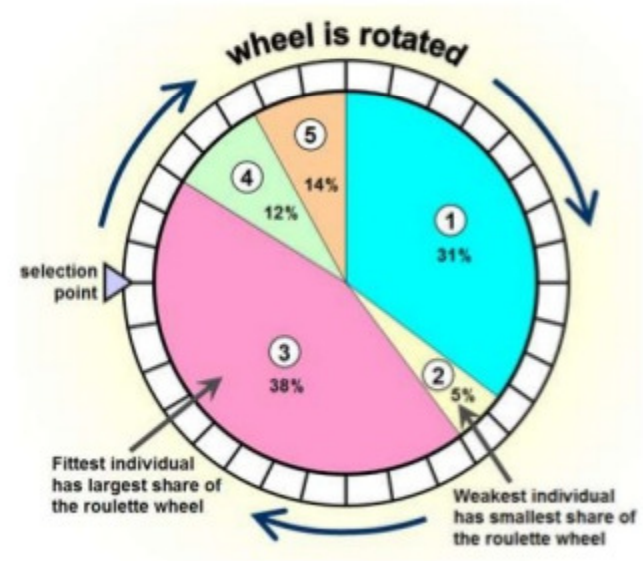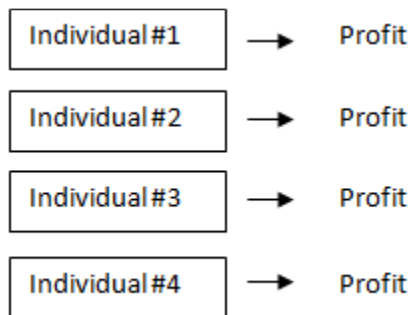
Crossover and Mutation

Breeding (Crossover)

Volume 50k	Price $3	New High 80

Volume 250k	Price $8	New High 120

Volume 250k	Price $3	New High 120

Mutation

Volume 250k	Price $4	New High 120

Each Generation gets better
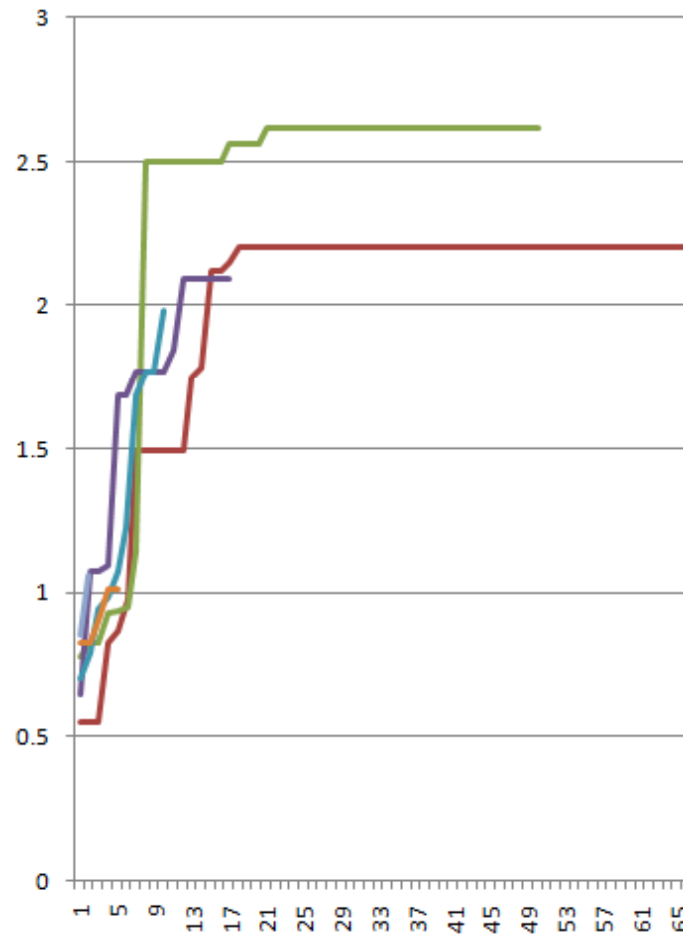
Evolution of Generations

Generation 0

Generation 11

Generation 10
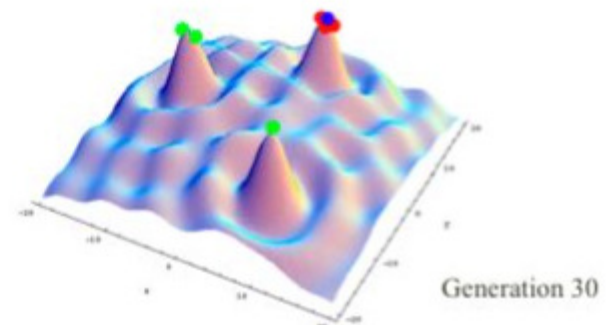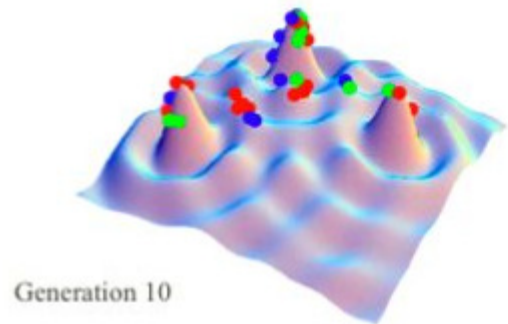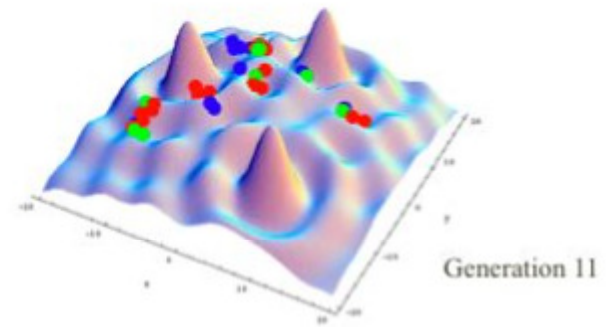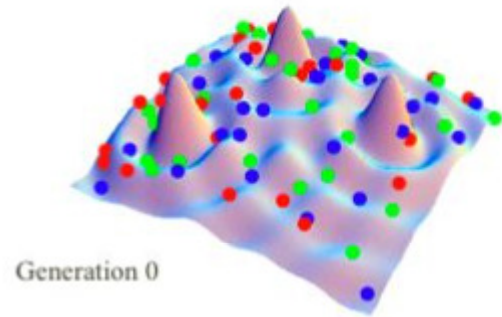
Generation 30

GA – 1st Generation

Randomly generate individuals with the value in each dimension evenly distributed. (The blue dots are the top 30% of the individuals.)
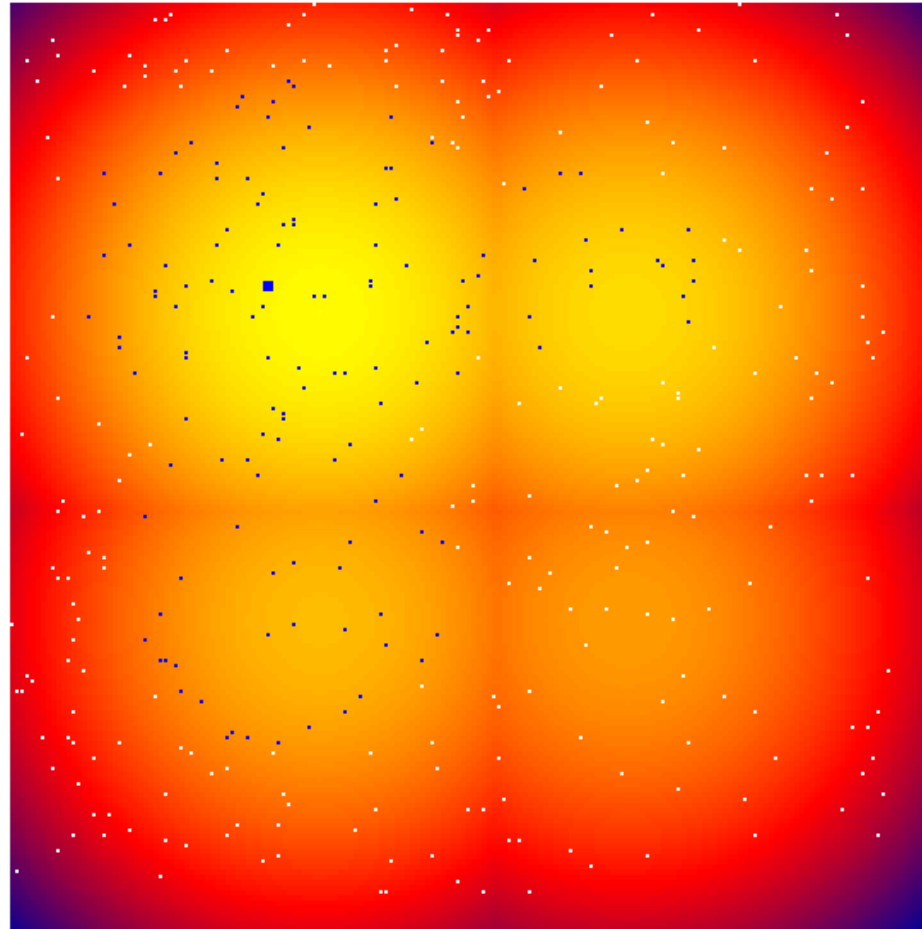
GA – 2nd Generation

The individuals are starting to converge around the best value because the highest individuals are prioritized during the breeding.
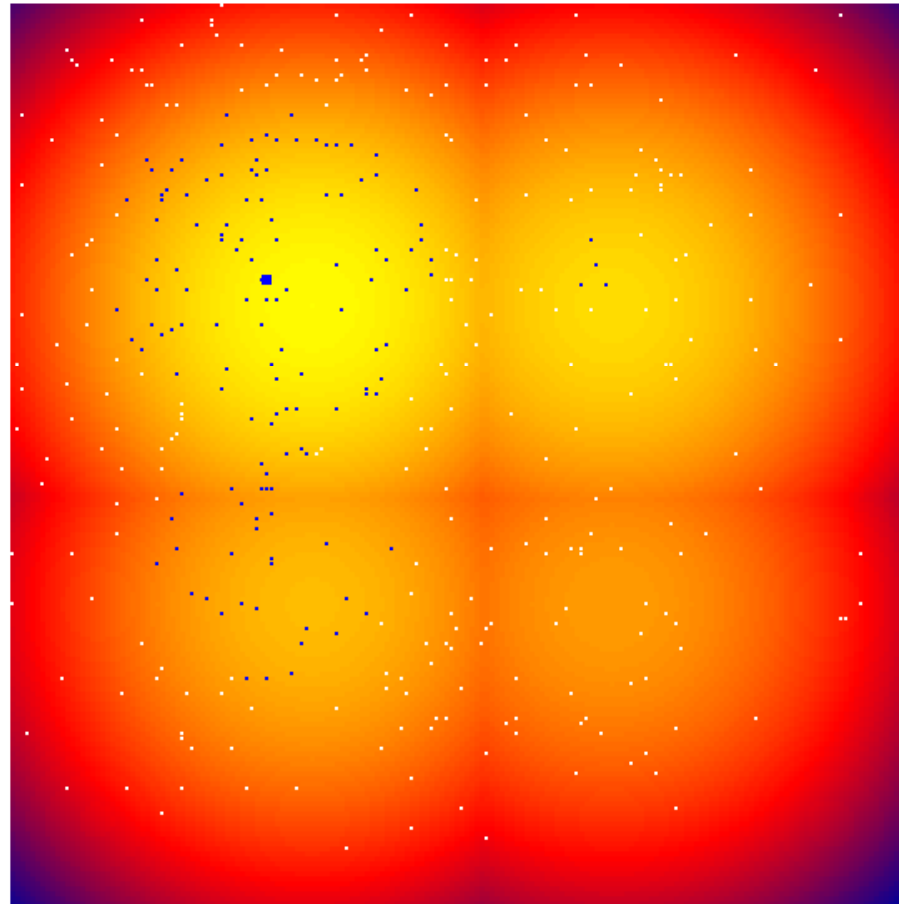
GA – 5th Generation

By the 5th generation the individuals are concentrated around the upper left where the highest maximum is located.
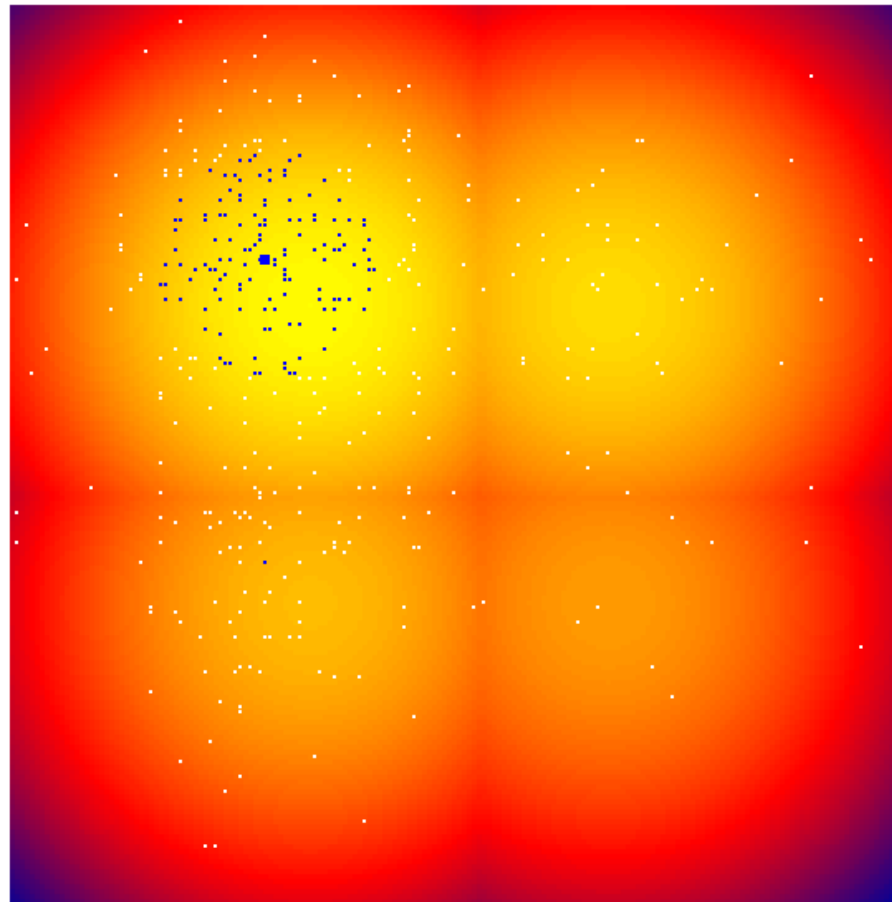
Adaptive Allocation

Pick	Score		Min	Scan	Symbol	Name
	86		59	Sharpe Ratio	MASI	Masimo Corporation
1	84	Best	65	New High Low-Filter High-Score	CENTA	Central Garden & Pet Company
	82		60	Exponential Close	SHOP	Shopify Inc.

Volume Ratio

Price Ratio

Annual Return

Sharpe Ratio

Price Rise

Price Rise Rate

Volitility

Profit(x) vs. Score(y) 0.28 Corr
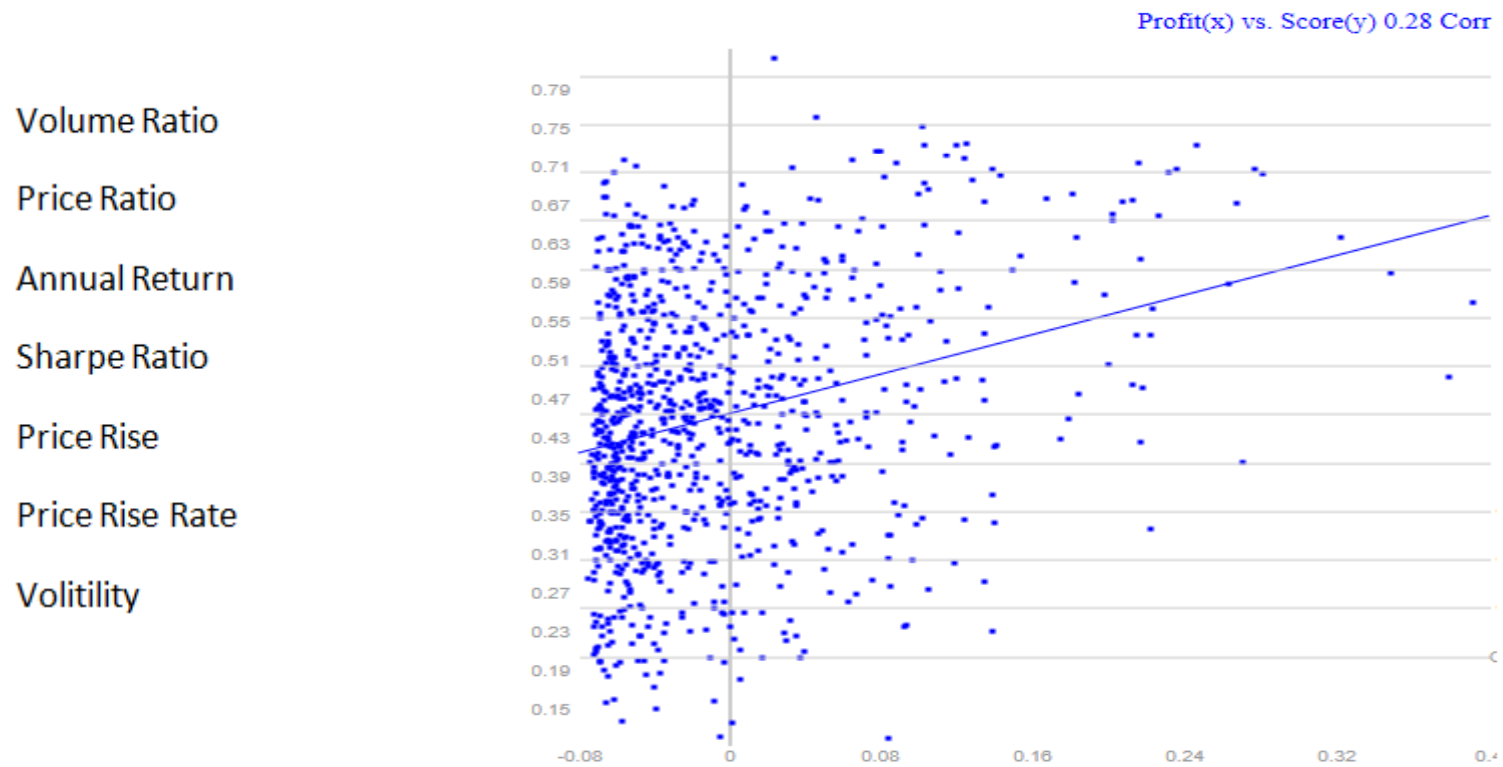
Fast Computers

Scan	Backward Testing									Scored
	Tested	Weeks	Buys	Up%	Profit	Pks/Wk	Gens	MnsGen	IndsGen	
Cyclic	02/06/2017	52	22	95%	4.82%	0.4	30	3:27	29,050	01/28/2017
AnnRet										
Alpha	02/28/2017	52	6568	54%	1.39%	10	10	8:33	183	02/09/2017
TopVolume	02/01/2017	52	115	68%	3.24%	2	30	6:02	0	01/28/2017
NewHighLFHS	02/02/2017	52	752	85%	3.07%	10	11	9:18	544	
MACD	02/05/2017	52	601	74%	4.44%	10	30	5:51	2,733	02/05/2017
MeanReversionDow30	03/01/2017	52	98	68%	4.55%	1	30	5:54	28,246	
RSI	02/04/2017	52	23	87%	3.40%	0.4	30	6:01	27,546	02/08/2017
SwingSTS	03/06/2017	52	335	58%	1.49%	6	30	10:01	1,437	
Cyclic3	03/11/2017	52	872	61%	1.85%	6	19	18:11	417	03/04/2017
Breakout	03/04/2017	52	70	61%	2.12%	1	30	5:02	29,216	02/08/2017
Up2	02/12/2017	52	369	82%	3.51%	6	30	5:59	1,427	
AscendingTriangleBreakout	02/23/2017	52	41	56%	1.46%	0.8	20	0:25	28,600	
Sharpe	02/11/2017	52	23	74%	2.32%	0.4	30	4:47	28,212	
Cyclic2	02/05/2017	52	303	83%	2.55%	5	20	14:48	1,606	01/28/2017
GrowthEMA	02/14/2017	52	289	70%	2.57%	4	30	6:00	6,932	
TurtleBreakout2	02/21/2017	52	670	65%	3.00%	13	30	5:58	3,063	
TopGainer	01/29/2017	52	108	65%	3.01%					
NewHigh	02/01/2017	52	554	72%	2.64%	10	30	6:00	0	
Up3	02/16/2017	52	663	62%	2.69%	13	30	5:43	1,660	
Totals									8,412k	

Nightly

		Pick						One Year	
Pick	Score		Min	Scan	Symbol	Name		Sector	Close
	86		59	Sharpe Ratio	MASI	Masimo Corporation		Healthcare	84.11
1	84	Best	65	New High Low-Filter High-Score	CENTA	Central Garden & Pet Company			33.73
	82		60	Exponential Close	SHOP	Shopify Inc.			61.52
	82		60	Exponential Close	PAH	Platform Specialty Products Corporation			13.35
	81		60	Exponential Close	XRAY	Dentsply International		Healthcare	62.68
	75		64	Alpha	GV	Goldfield Corp.		Industrial Goods	7.00
2	74	Best	65	New High Low-Filter High-Score	HTLF	Heartland Financial USA Inc.		Financial	49.10
	74		64	Alpha	OCLR	Oclaro			11.02
3	73	Best	41	Growth	GPL	Great Panther Silver Limited			2.18
	72		59	Sharpe Ratio	POOL	Pool Corp		Consumer Goods	116.61
4	72	Best	65	New High Low-Filter High-Score	STL	Sterling Bancorp		Financial	25.10
	71		52	Growth 8x20	NVMI	Nova Measuring Instruments Ltd.		Industrial Goods	17.00
	66		50	Turtle Breakout	UEIC	Universal Electronics Inc.		Consumer Goods	72.65
	61		52	Growth 8x20	ADSK	Autodesk Inc.		Technology	86.40
	55		50	Turtle Breakout	VBIV	VBI Vaccines Inc.			4.79
	55	Low	86	Up	RP	RealPage		CDX	34.55
	54		45	Aroon	ROCK	Gibraltar Industries Inc.		Basic Materials	40.30
	53		52	Growth 8x20	GSBD	Goldman Sachs BDC			25.09
	51		50	Turtle Breakout	HZO	Marinemax Inc.		Services	22.70
	48		44	Growth EMA	GSIT	GSI Technology Inc.		Technology	6.99
	47		25	Relative Strength Indicator 40-50	DGII	Digi International Inc.		Technology	13.05
5	45	Best	41	Growth	CVEO	Civeo Corporation			3.19
	42	Low	54	New High	XCRA	Xcerra Corporation			8.30
	36		25	Relative Strength Indicator 30-40	CAI	CACI International Inc.		Services	17.17

One Suggestion
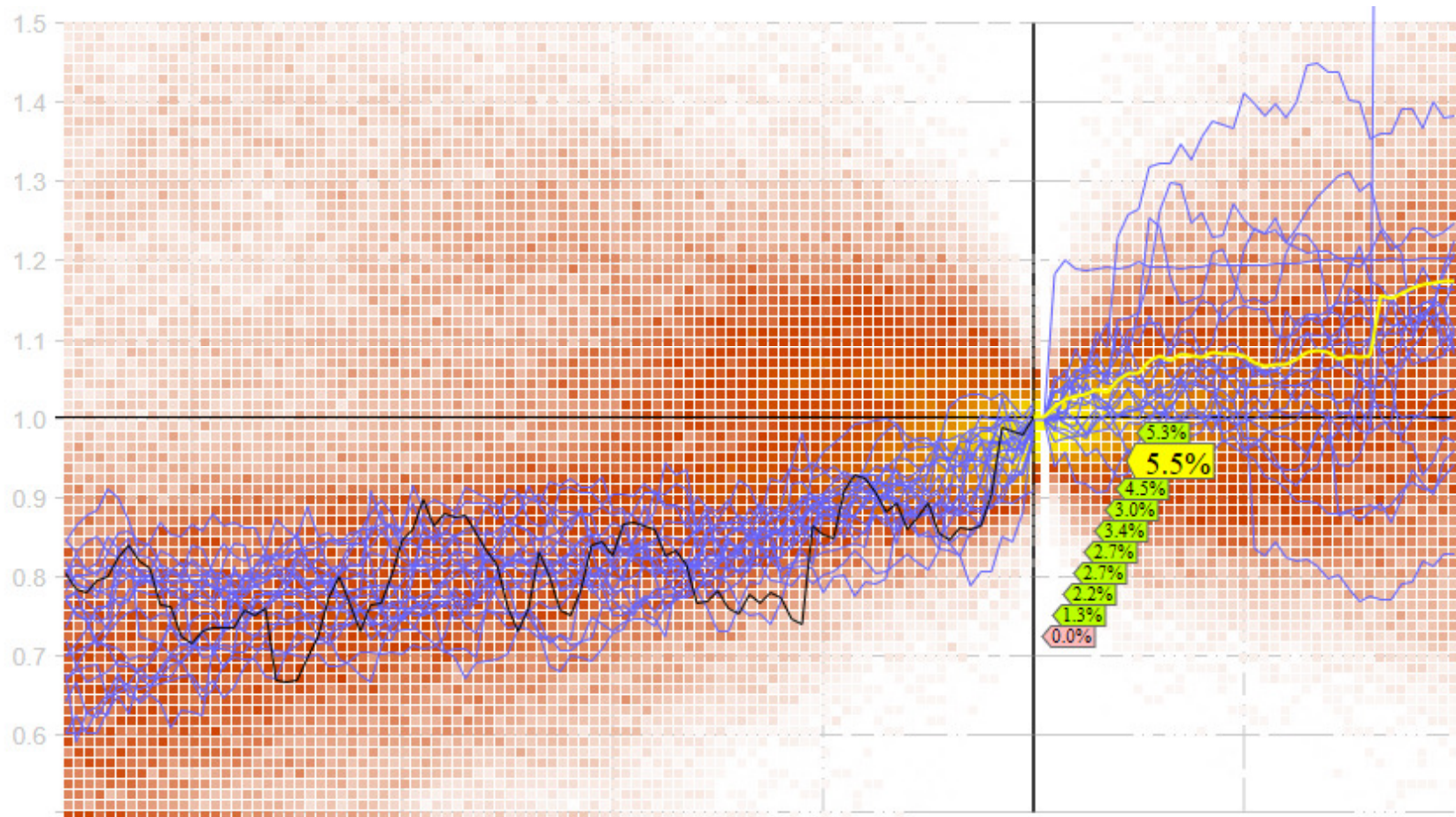
Intraday Review – last chance!

Quick morning review and compare with similar stocks.

Results

Month	Start	End	Percent	Drawdown		Holding
7/01/2016	$15,836	$16,164	2.07%	2.07%	4	HD, LMT, AWK, MKTX
8/01/2016	$16,164	$15,581	-3.61%	-1.61%	4	HD, LMT, AWK, MKTX
9/01/2016	$15,581	$15,338	-1.56%	-3.15%	4	HD, LMT, AWK, MKTX
10/01/2016	$15,338	$14,827	-3.33%	-6.37%	4	HD, LMT, AWK, MKTX
11/01/2016	$14,827	$15,628	5.41%	-1.31%	4	HD, LMT, AWK, MKTX
12/01/2016	$21,289	$20,878	-1.93%	-2.88%	6	HD, LMT, AWK, MKTX, ACAS, SAFT
1/01/2017	$23,709	$24,271	2.37%	-0.23%	7	HD, LMT, AWK, SAFT, NVG, MTW, ORBK
2/01/2017	$35,594	$35,265	-0.93%	-1.08%	9	HD, LMT, AWK, MTW, ORBK, CNC, SHOP, SAIC, WIX
3/01/2017	$24,280	$24,955	2.78%	1.17%	6	HD, LMT, AWK, ORBK, SHOP, GV

Lessons

- Don't buy into a down day
- Patience (we don't have to buy each day)
- Read a lot (Way of the Turtle)
- More data, more cycles
- Earning's reports
- Politicians can have a big effect