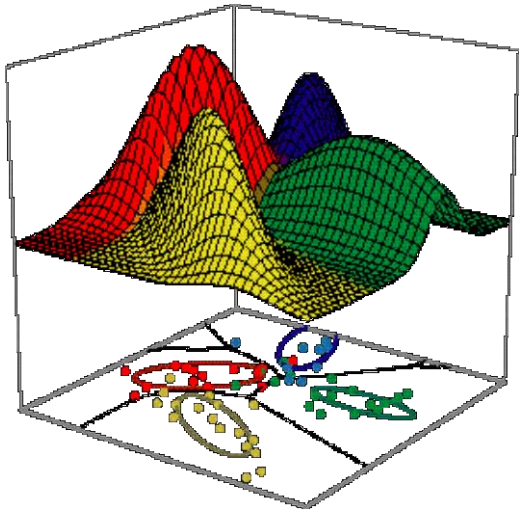
SYSC5405/BIOM5405

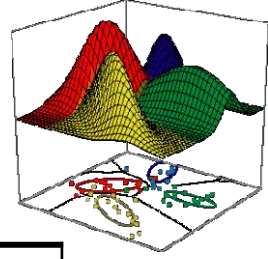


Awards Ceremony

7 April 2016

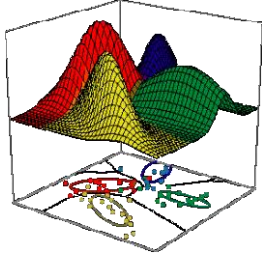
or, potentially the most exciting day of some of your lives…

Recap of methods



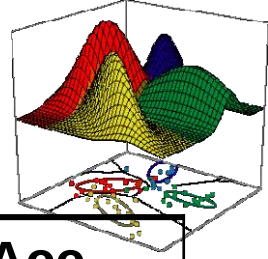
	Group Members	Approach
1	Madison/Kevin	Decision forests
2	Johnny/Nikhilesh	Support Vector Machines
3	Anthony/Jonathan D	Convolutional Neural Networks
4	Amrik/Franck	K-nearest-neighbour
5	Amin/Oleg	Feedforward ANNs
6	Nate/Brad	Probabilistic neural networks
7	Soheil/Marco	Decision Trees
8	Zach/Aly	K-means Classifier
9	Youhao/Yuji	Bayesian approaches
10	Chen Zhang	Logistic regression
11	Andrew/Nicolas	LDA/SVM
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets

The problem



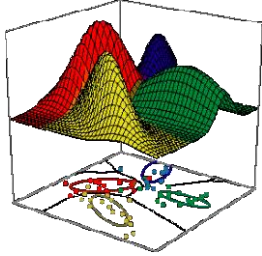
- Goal:
  - Prediction of mouth state using only (low quality) mouth images
  - 6 classes:
    - C=Mouth Closed
    - O=Mouth Open
    - U=Tongue protruding UP
    - D=Tongue protruding DOWN
    - L=Tongue protruding LEFT
    - R=Tongue protruding RIGHT
  - 4 training subjects in six lighting conditions
  - 6 testing subjects in two lighting conditions

Predicted accuracy!



	Group Members	Approach	Acc
1	Madison/Kevin	Decision forests	0.555
2	Johnny/Nikhilesh	Support Vector Machines	0.386
3	Anthony/Jonathan D	Convolutional Neural Networks	0.972
4	Amrik/Franck	K-nearest-neighbour	0.994
5	Amin/Oleg	Feedforward ANNs	0.916
6	Nate/Brad	Probabilistic neural networks	0.567
7	Soheil/Marco	Decision Trees	0.800
8	Zach/Aly	K-means Classifier	0.972
9	Youhao/Yuji	Bayesian approaches	0.690
10	Chen Zhang	Logistic regression	0.930
11	Andrew/Nicolas	LDA/SVM	0.928
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990

Evaluation Details



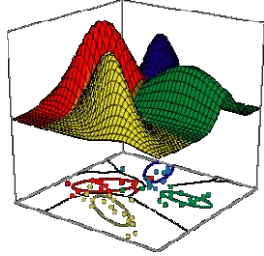
- You were evaluated on:
  - 1) Prediction accuracy over blind test data set
    - as measured by correct classification rate over all 18 test samples

$$Score_{accuracy} = CCR$$

  - 2) How close your predicted accuracy is to your actual test accuracy
    - Provide a mean accuracy and standard deviation σ

$$Score_{precision} = p(x = Score_{actual}), \text{if } p(x) \sim N\left(Score_{pred}, \sigma^2\right)$$

Score1 (CCR)



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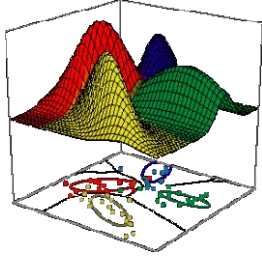
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990	

Score1 (CCR)



	Group Members	Approach	Predicted CCR	Actual CCR
1	Madison/Kevin	Decision forests	0.555	
2	Johnny/Nikhilesh	Support Vector Machines	0.386	0.000
3	Anthony/Jonathan D	Convolutional Neural Networks	0.972	
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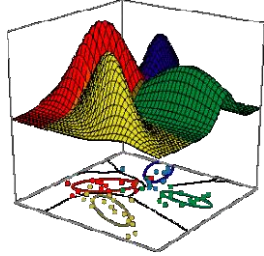
??

Score1 (CCR)



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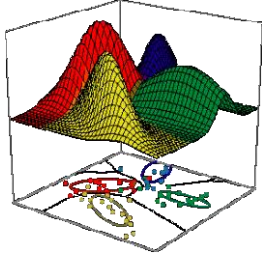
Score1 (CCR)



	Group Members	Approach	Predicted CCR	Actual CCR
1	Madison/Kevin	Decision forests	0.555	
2	Johnny/Nikhilesh	Support Vector Machines	0.386	0.245
3	Anthony/Jonathan D	Convolutional Neural Networks	0.972	
4	Amrik/Franck	K-nearest-neighbour	0.994	
5	Amin/Oleg	Feedforward ANNs	0.916	
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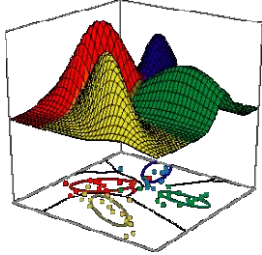

	Group Members	Approach	Predicted CCR	Actual CCR
1	Madison/Kevin	Decision forests	0.555	0.427
2	Johnny/Nikhilesh	Support Vector Machines	0.386	0.000
3	Anthony/Jonathan D	Convolutional Neural Networks	0.972	
4	Amrik/Franck	K-nearest-neighbour	0.994	
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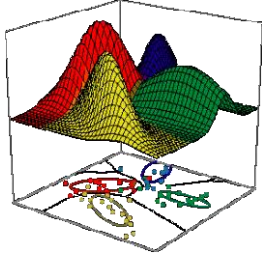

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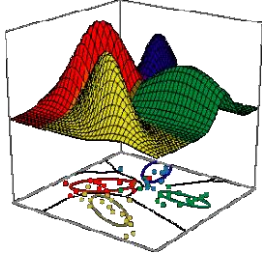

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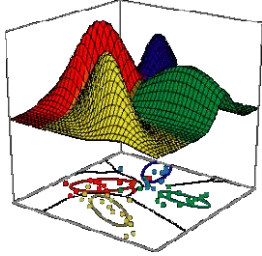

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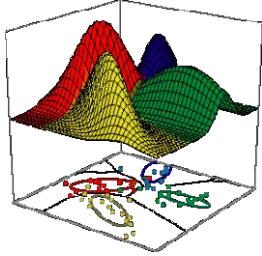

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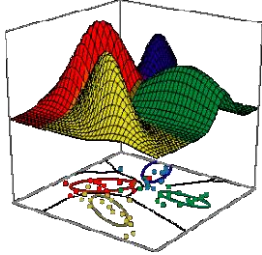

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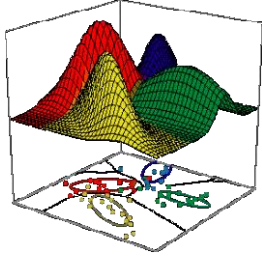
8	Zach/Aly	K-means Classifier	0.972	
9	Youhao/Yuji	Bayesian approaches	0.690	0.482
10	Chen Zhang	Logistic regression	0.930	0.165
11	Andrew/Nicolas	LDA/SVM	0.928	0.752
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990	

Score1 (CCR)



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6	Nate/Brad	Probabilistic neural networks	0.567	0.510
7	Soheil/Marco	Decision Trees	0.800	0.697
8	Zach/Aly	K-means Classifier	0.972	0.725
9	Youhao/Yuji	Bayesian approaches	0.690	0.482
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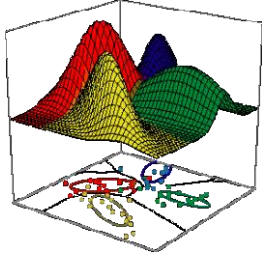
11	Andrew/Nicolas	LDA/SVM	0.928	
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990	

Score1 (CCR)



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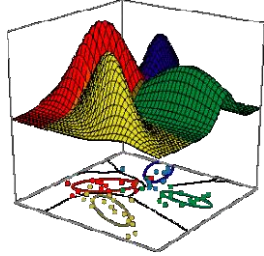
Score1 (CCR)



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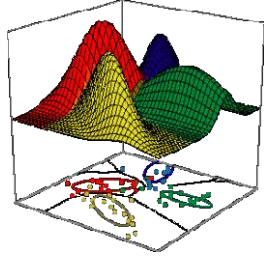
10	Chen Zhang	Logistic regression	0.930	0.165
11	Andrew/Nicolas	LDA/SVM	0.928	0.752
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990	

Score1 (CCR)



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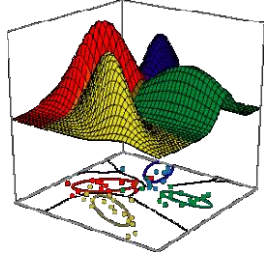
9	Youhao/Yuji	Bayesian approaches	0.690	0.482
10	Chen Zhang	Logistic regression	0.930	0.165
11	Andrew/Nicolas	LDA/SVM	0.928	0.752
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990	0.953

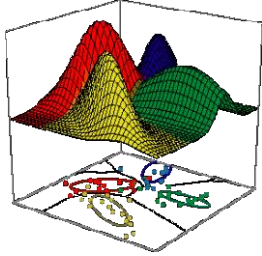
CONGRATULATIONS BINGHAO & JONATHAN_B!!

Group 12 (CCR=0.9500)



Predicted \ Actual	C	O	U	D	R	L
C	3337	0	23	7	0	0
O	20	2534	0	48	21	14
U	15	97	2913	3	11	73
D	63	9	15	3097	181	133
R	64	24	22	13	3447	17
L	0	1	1	23	0	2973

Evaluation Details



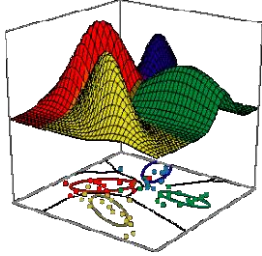
- You were evaluated on:
  - 1) Prediction accuracy over blind test data set
    - as measured by correct classification rate over all 18 test samples

$$Score_{accuracy} = CCR$$

  - 2) How close your predicted accuracy is to your actual test accuracy
    - Provide a mean accuracy and standard deviation σ

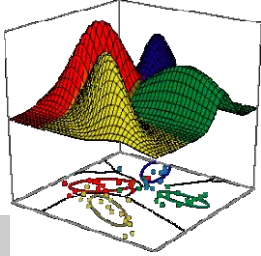
$$Score_{precision} = p(x = Score_{actual}), \text{if } p(x) \sim N\left(Score_{pred}, \sigma^2\right)$$

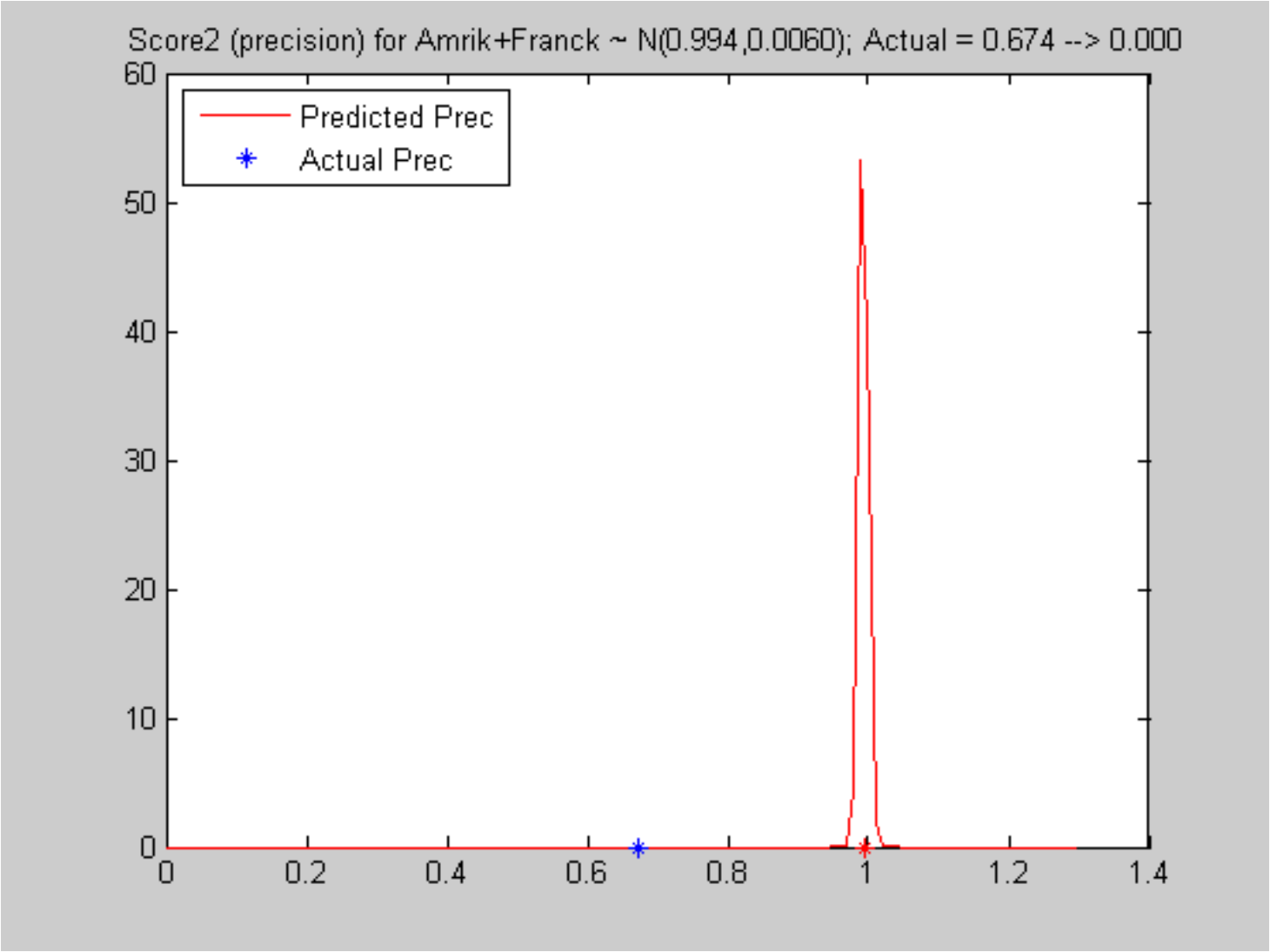
Predicted Accuracy!



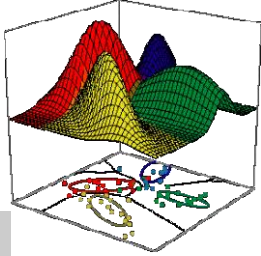
	Group Members	Approach	Predicted CCR	Predicted SD
1	Madison/Kevin	Decision forests	0.555	0.020
2	Johnny/Nikhilesh	Support Vector Machines	0.386	0.100
3	Anthony/Jonathan D	Convolutional Neural Networks	0.972	0.020
4	Amrik/Franck	K-nearest-neighbour	0.994	0.006
5	Amin/Oleg	Feedforward ANNs	0.916	0.016
6	Nate/Brad	Probabilistic neural networks	0.567	0.050
7	Soheil/Marco	Decision Trees	0.800	0.150
8	Zach/Aly	K-means Classifier	0.972	0.011
9	Youhao/Yuji	Bayesian approaches	0.690	0.100
10	Chen Zhang	Logistic regression	0.930	0.150
11	Andrew/Nicolas	LDA/SVM	0.928	0.004
12	Jonathan B/Binghao	Deconvolutional / Convolutional Neural Nets	0.990	0.004

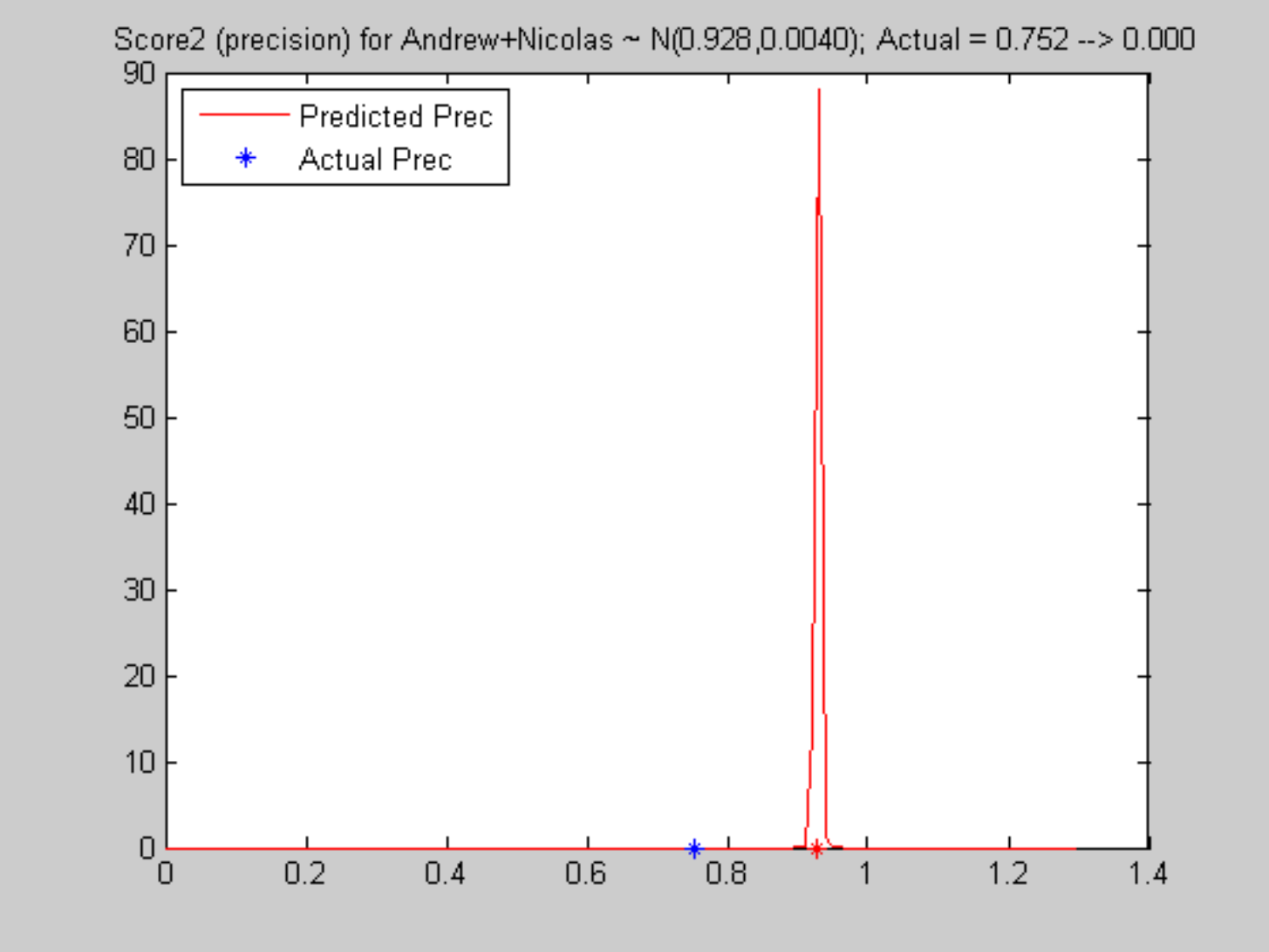
Score2



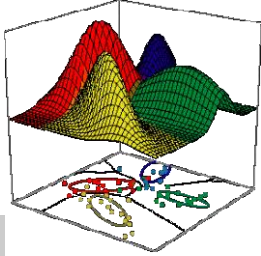

Score2 (precision) for Amrik+Franck ~ N(0.994,0.0060); Actual = 0.674 --> 0.000
Predicted Prec
Actual Prec
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

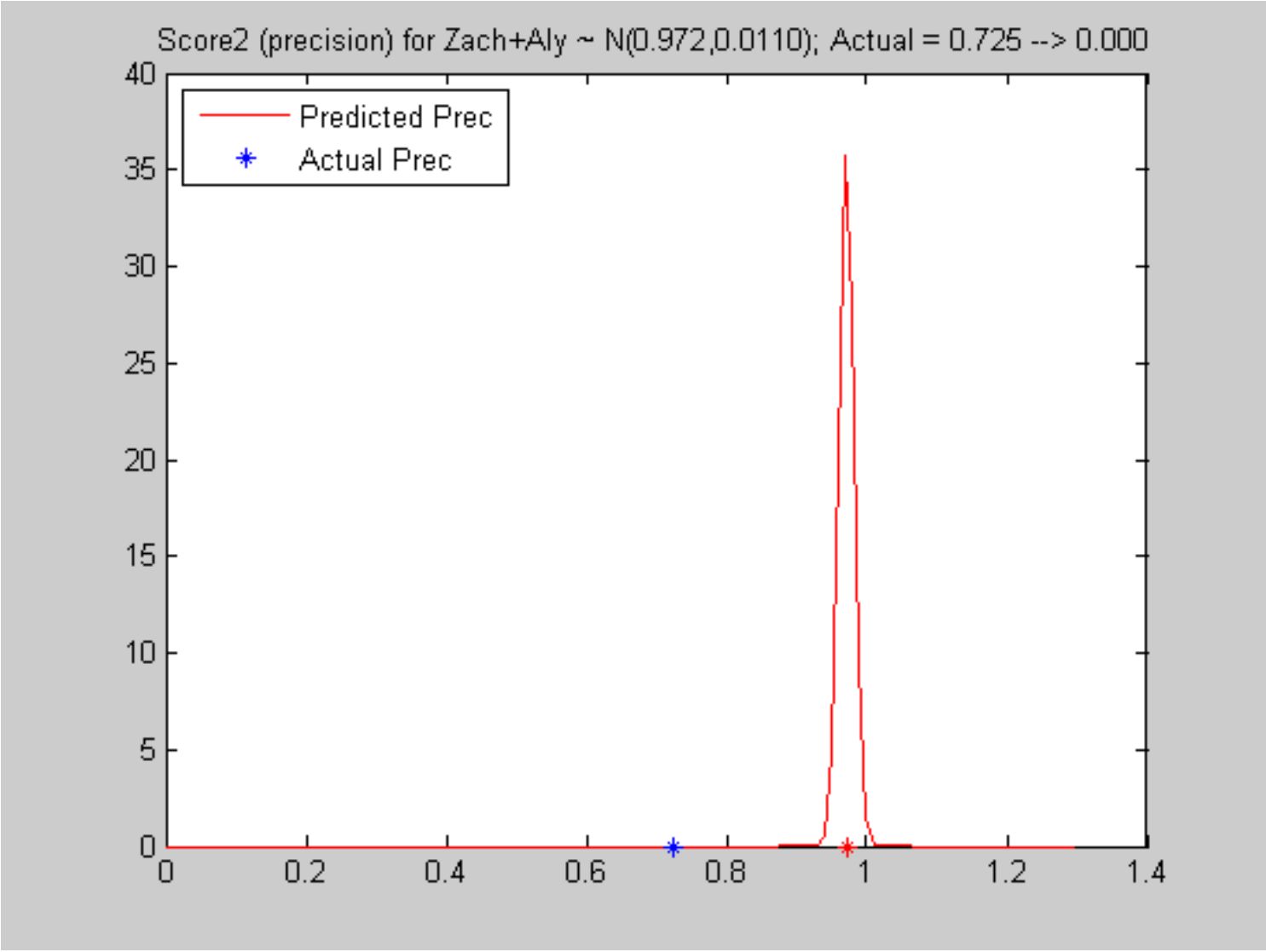
Score2



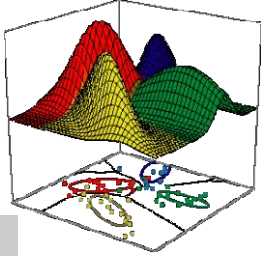

Score2 (precision) for Andrew+Nicolas ~ N(0.928,0.0040); Actual = 0.752 --> 0.000
Predicted Prec
Actual Prec
90
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

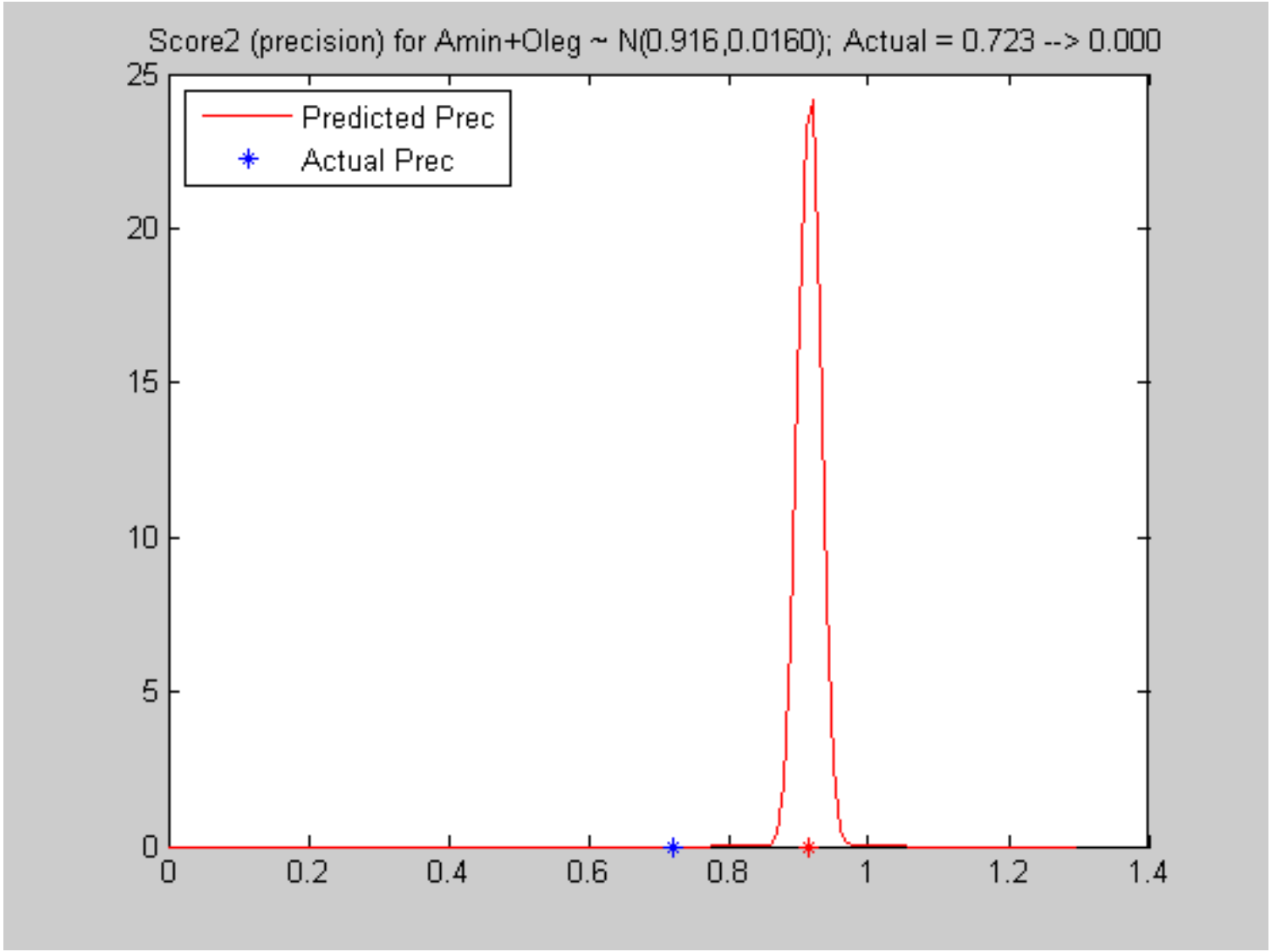
Score2



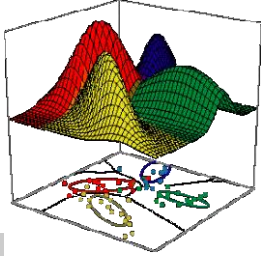

Score2 (precision) for Zach+Aly ~ N(0.972,0.0110); Actual = 0.725 --> 0.000
Predicted Prec
Actual Prec
40
35
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

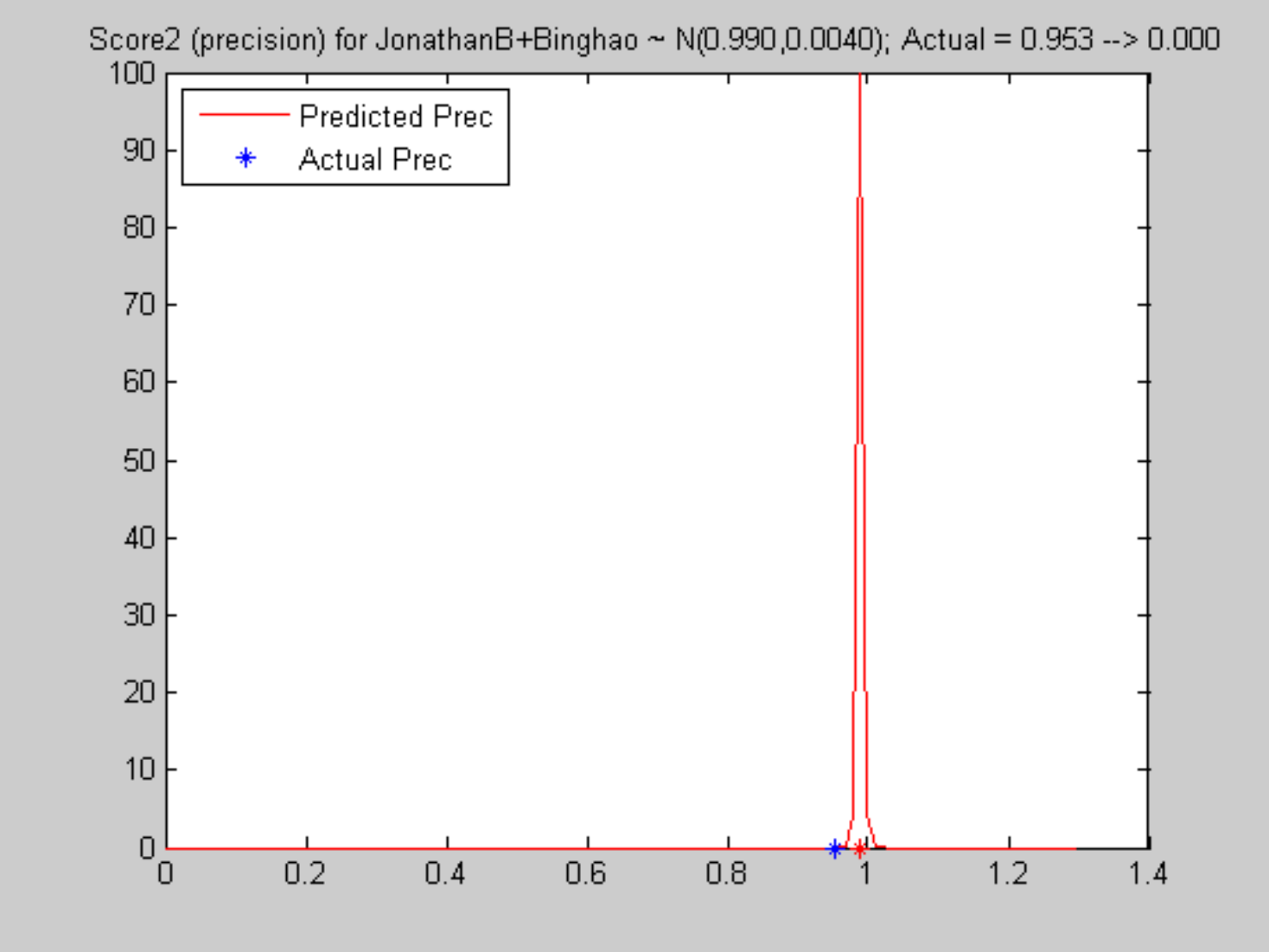
Score2



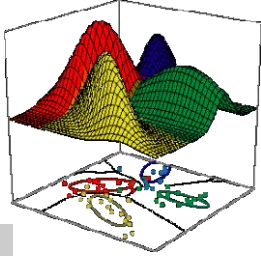

Score2 (precision) for Amin+Oleg ~ N(0.916,0.0160); Actual = 0.723 --> 0.000
Predicted Prec
Actual Prec
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

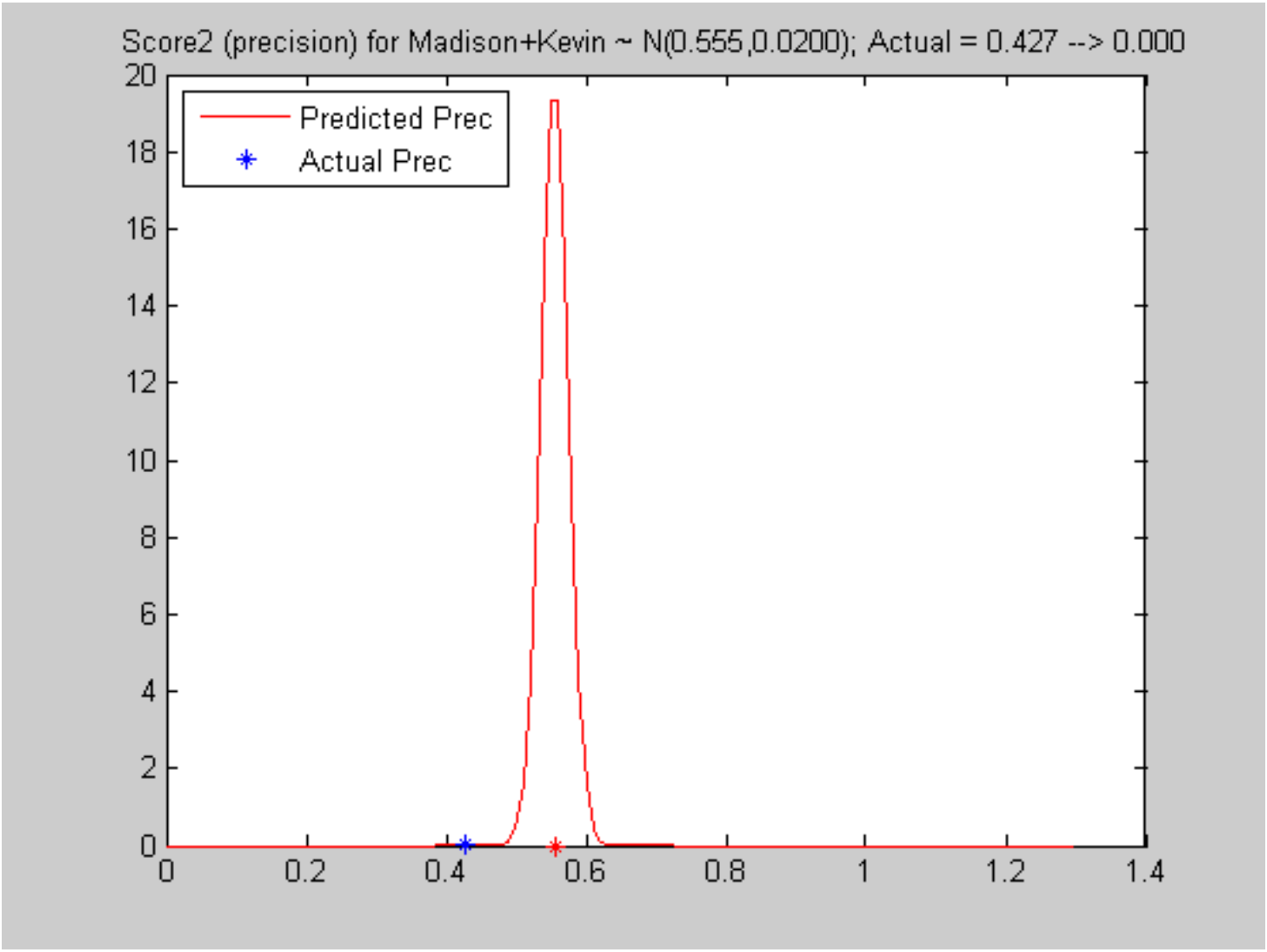
Score2



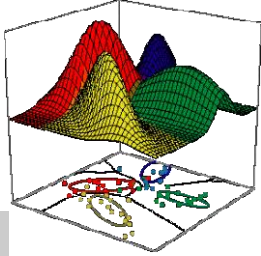

Score2 (precision) for JonathanB+Binghao ~ N(0.990,0.0040); Actual = 0.953 --> 0.000
Predicted Prec
Actual Prec
100
90
80
70
60
50
40
30
20
10
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

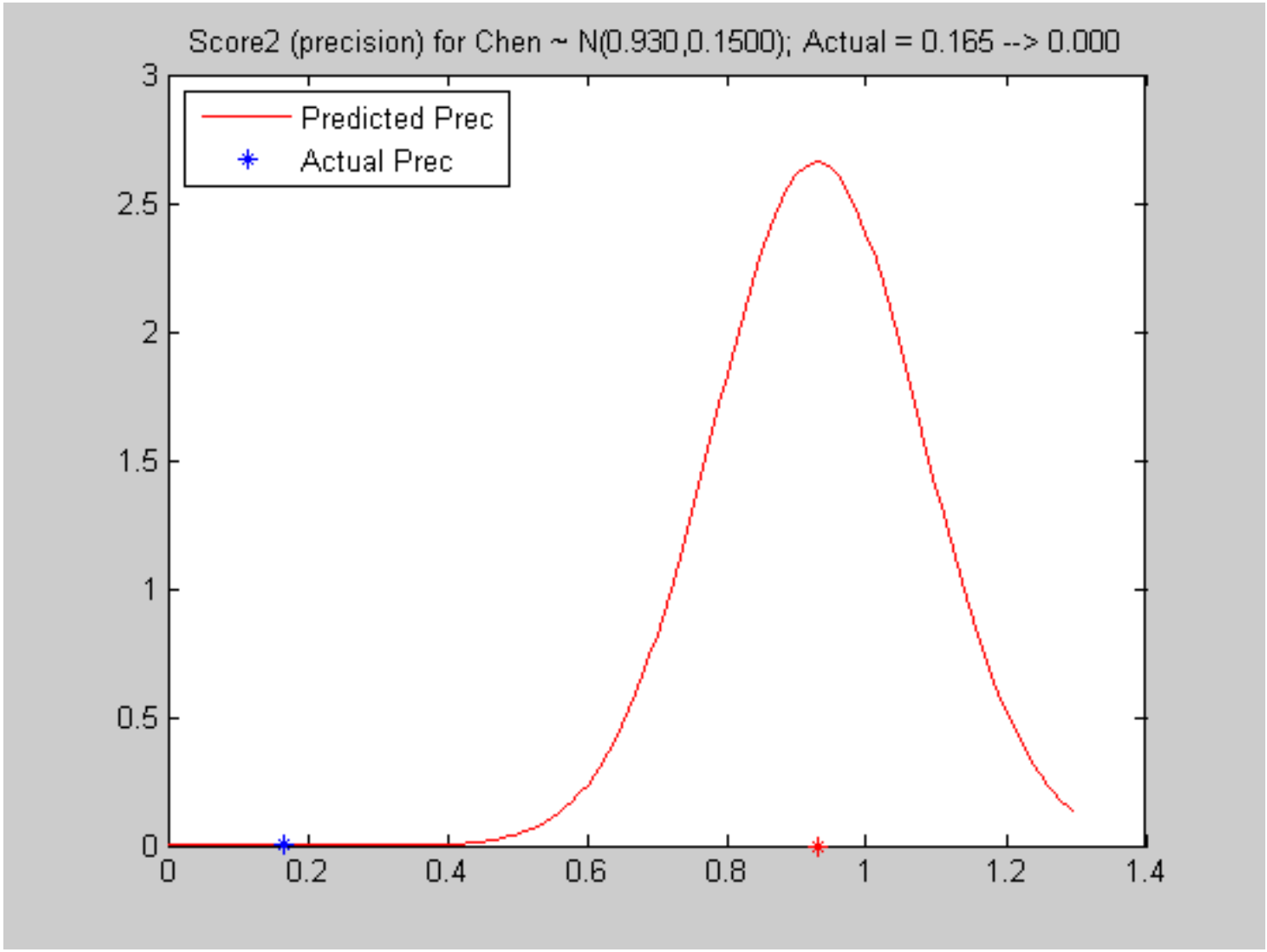
Score2



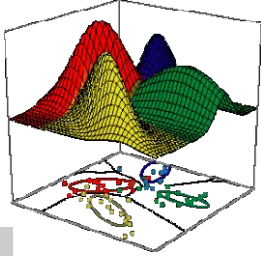

Score2 (precision) for Madison+Kevin ~ N(0.555,0.0200); Actual = 0.427 --> 0.000
Predicted Prec
Actual Prec
20
18
16
14
12
10
8
6
4
2
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

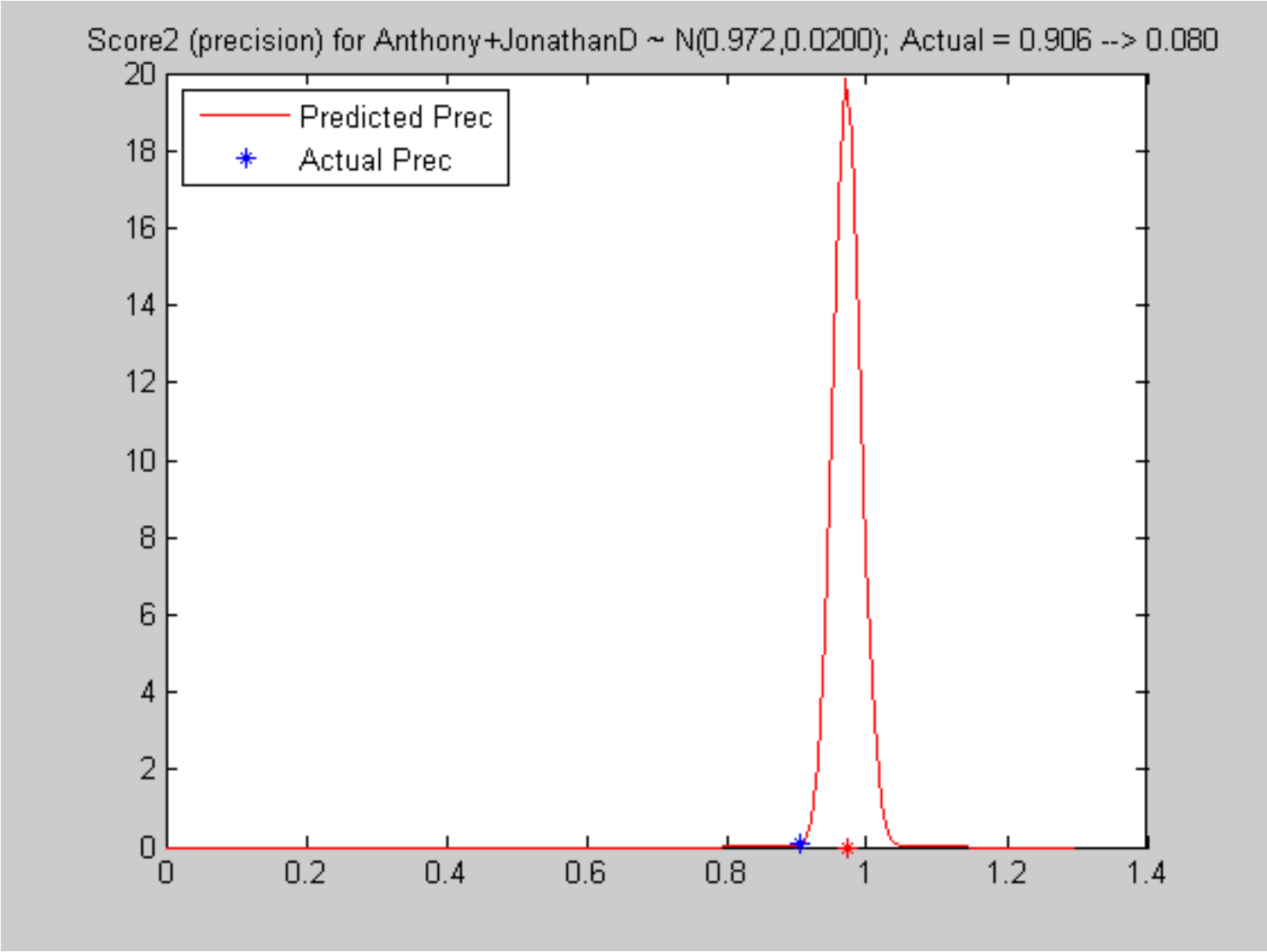
Score2



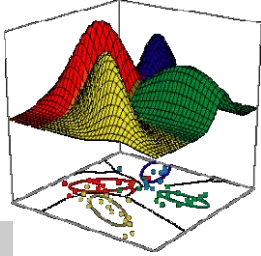

Score2 (precision) for Chen ~ N(0.930,0.1500); Actual = 0.165 --> 0.000
Predicted Prec
Actual Prec
3
2.5
2
1.5
1
0.5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

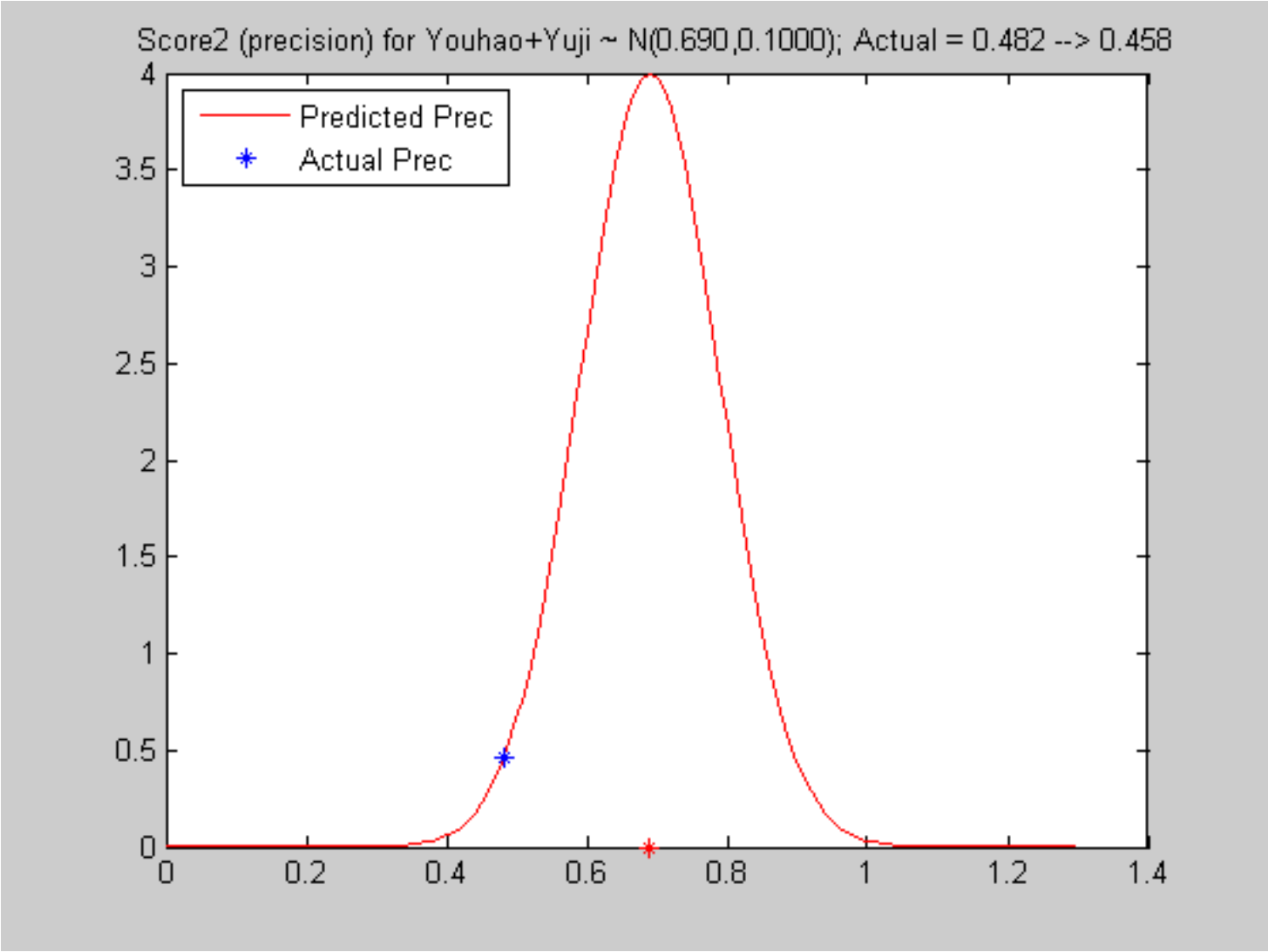
Score2



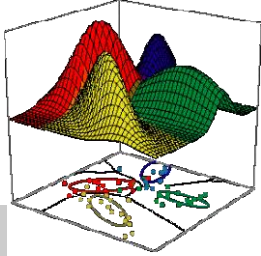

Score2 (precision) for Anthony+JonathanD ~ N(0.972,0.0200); Actual = 0.906 --> 0.080
Predicted Prec
Actual Prec
20
18
16
14
12
10
8
6
4
2
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

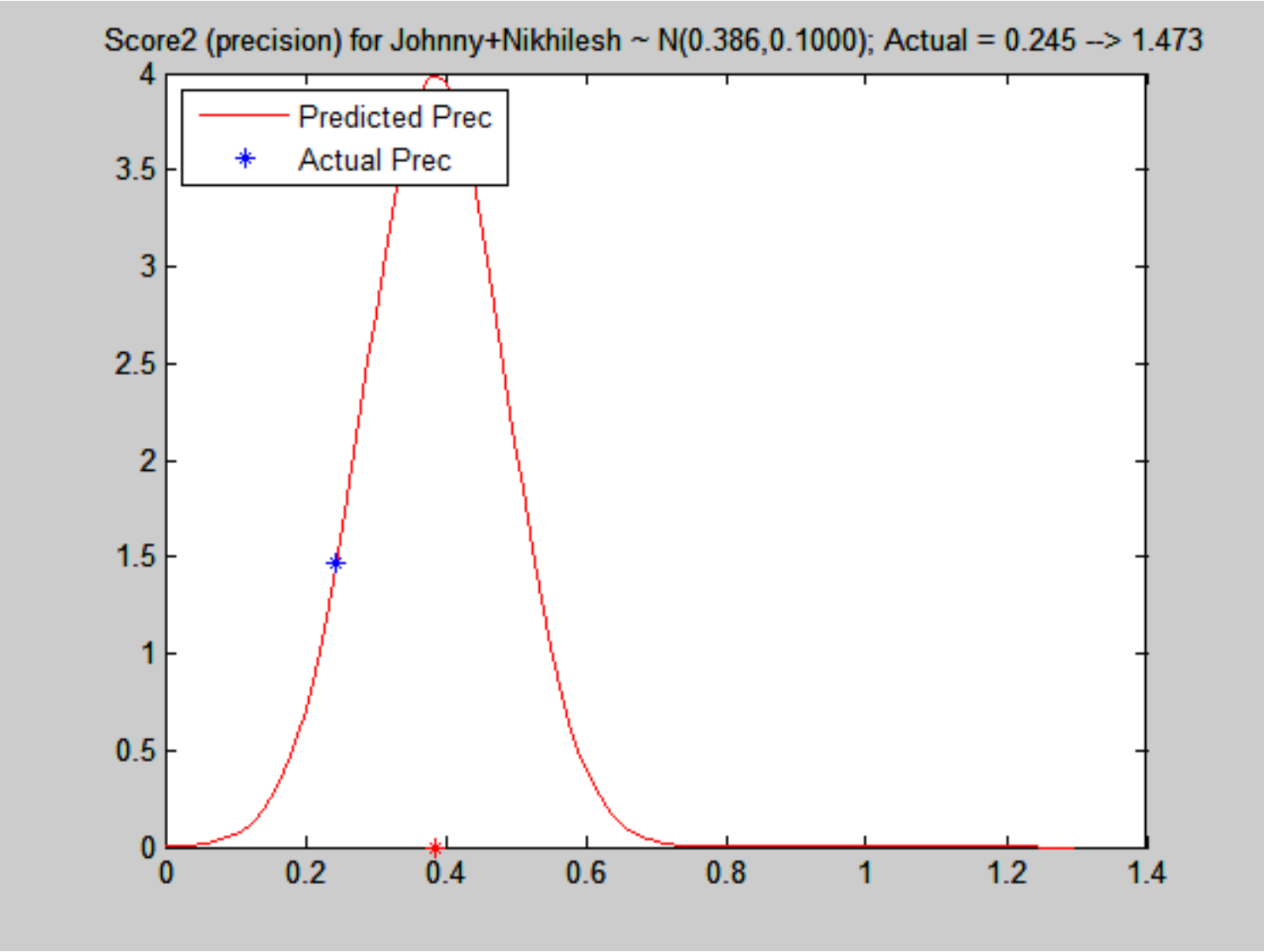
Score2



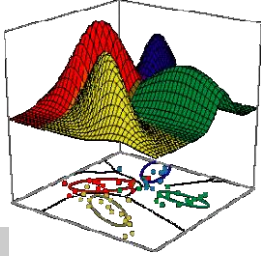

Score2 (precision) for Youhao+Yuji ~ N(0.690,0.1000); Actual = 0.482 --> 0.458
Predicted Prec
Actual Prec
4
3.5
3
2.5
2
1.5
1
0.5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

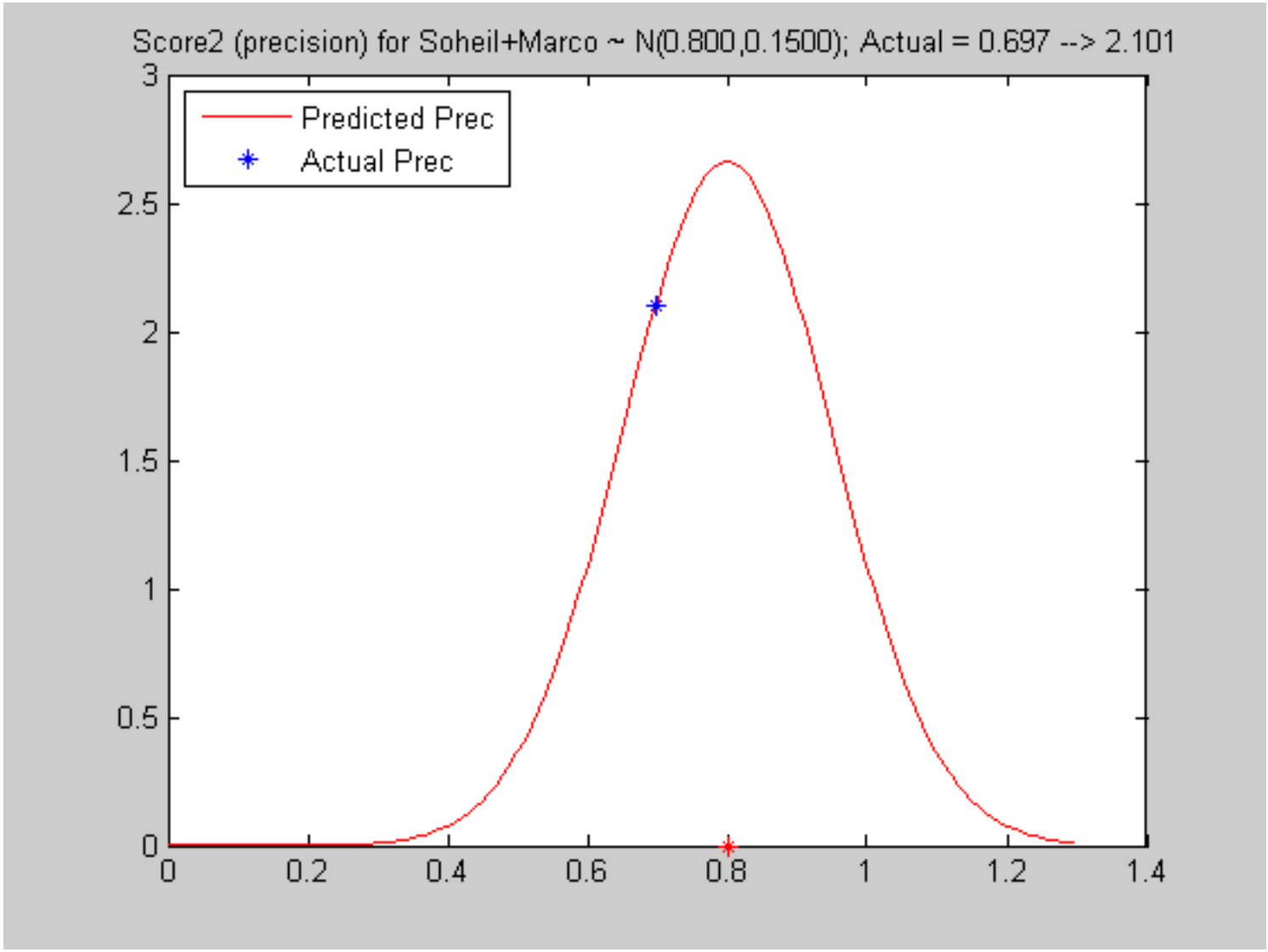
Score2



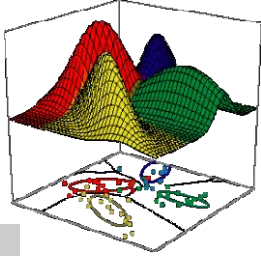

Score2 (precision) for Johnny+Nikhilesh ~ N(0.386,0.1000); Actual = 0.245 --> 1.473
Predicted Prec
Actual Prec
4
3.5
3
2.5
2
1.5
1
0.5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

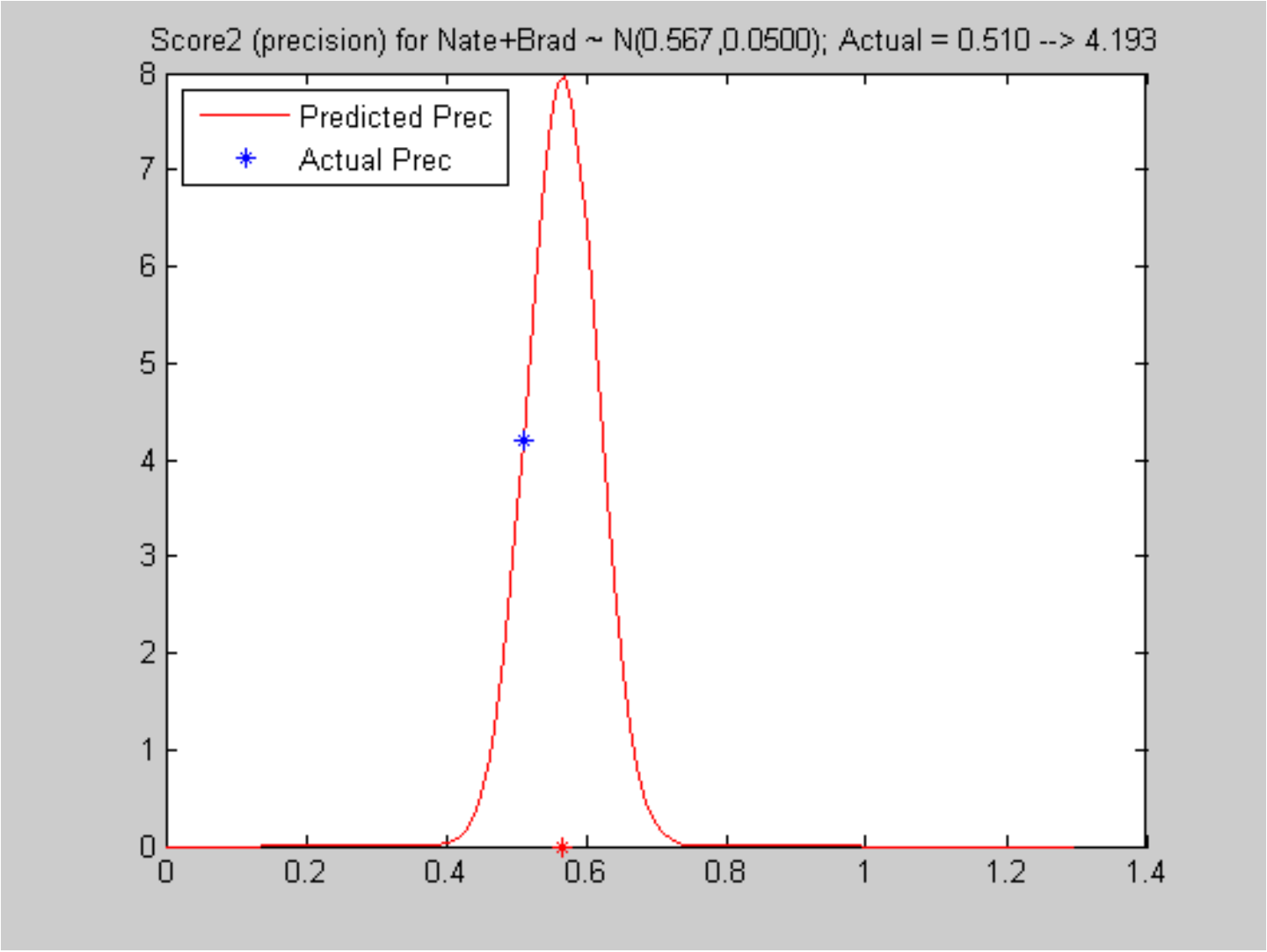
Score2



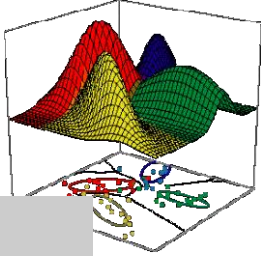

Score2 (precision) for Soheil+Marco ~ N(0.800,0.1500); Actual = 0.697 --> 2.101
Predicted Prec
Actual Prec
3
2.5
2
1.5
1
0.5
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

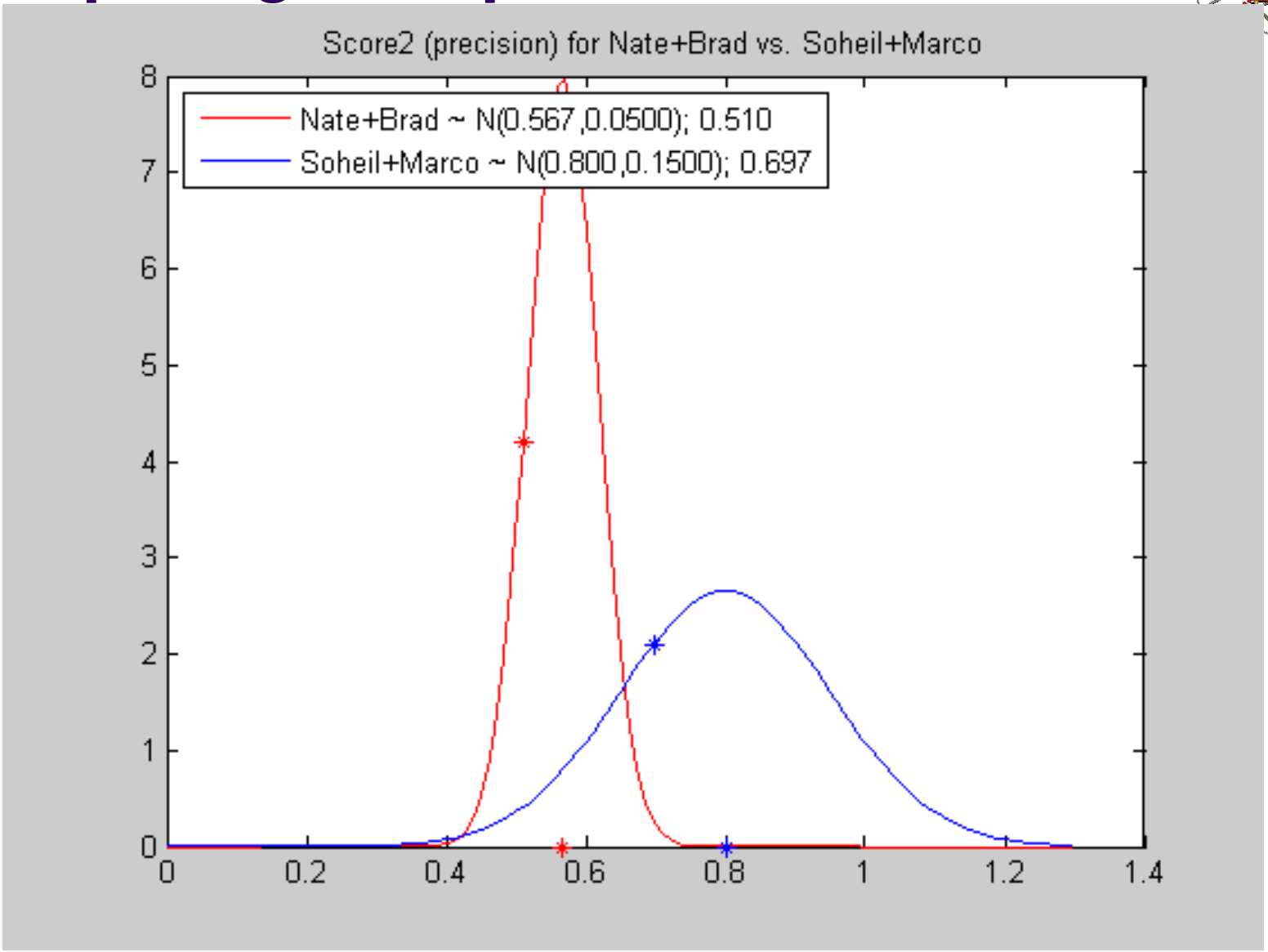
Score2



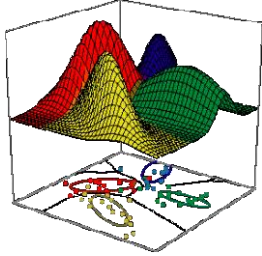

Score2 (precision) for Nate+Brad ~ N(0.567,0.0500); Actual = 0.510 --> 4.193
Predicted Prec
Actual Prec
0
1
2
3
4
5
6
7
8
0
0.2
0.4
0.6
0.8
1
1.2
1.4

Comparing Groups 6 & 7





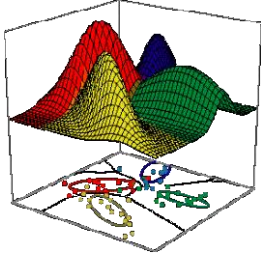
Summary of Score 2 (Precision)



	Group Members	Predicted CCR	Actual CCR	Score2
1	Madison+Kevin	0.555 +/- 0.020	0.427	0.000000
2	Johnny+Nikhilesh	0.386 +/- 0.100	0.245	1.473399
3	[illegible]	[illegible]	[illegible]	[illegible]
4	Amrik+Franck	0.994 +/- 0.006	0.674	0.000000
5	[illegible]	[illegible]	[illegible]	[illegible]
6	Nate+Brad	0.567 +/- 0.050	0.510	4.193437
7	Soheil+Marco	0.800 +/- 0.150	0.697	2.101175
8	Zach+Aly	0.972 +/- 0.011	0.725	0.000000
9	Youhao+Yuji	0.690 +/- 0.100	0.482	0.457659
10	Chen	0.930 +/- 0.150	0.165	0.000006
11	Andrew+Nicolas	0.928 +/- 0.004	0.752	0.000000
12	JonathanB+Binghao	0.990 +/- 0.004	0.953	0.000000

CONGRATULATIONS BRAD & NATE!!!

Schedule



√	**Thursday 10 March:**	Competition announced.
√	**Tuesday 22 March:**	Project proposal presentations
√	**Tuesday 5 April:**	Pitch presentations given.
√	**3pm Wednesday 6 April:**	Final classification of blind data submitted to instructor.
√	**Thursday 7 April:**	Results announced. Winners glorified. Prizes distributed.
→	**Monday 18 April:**	Final reports submitted **electronically** to instructor.