

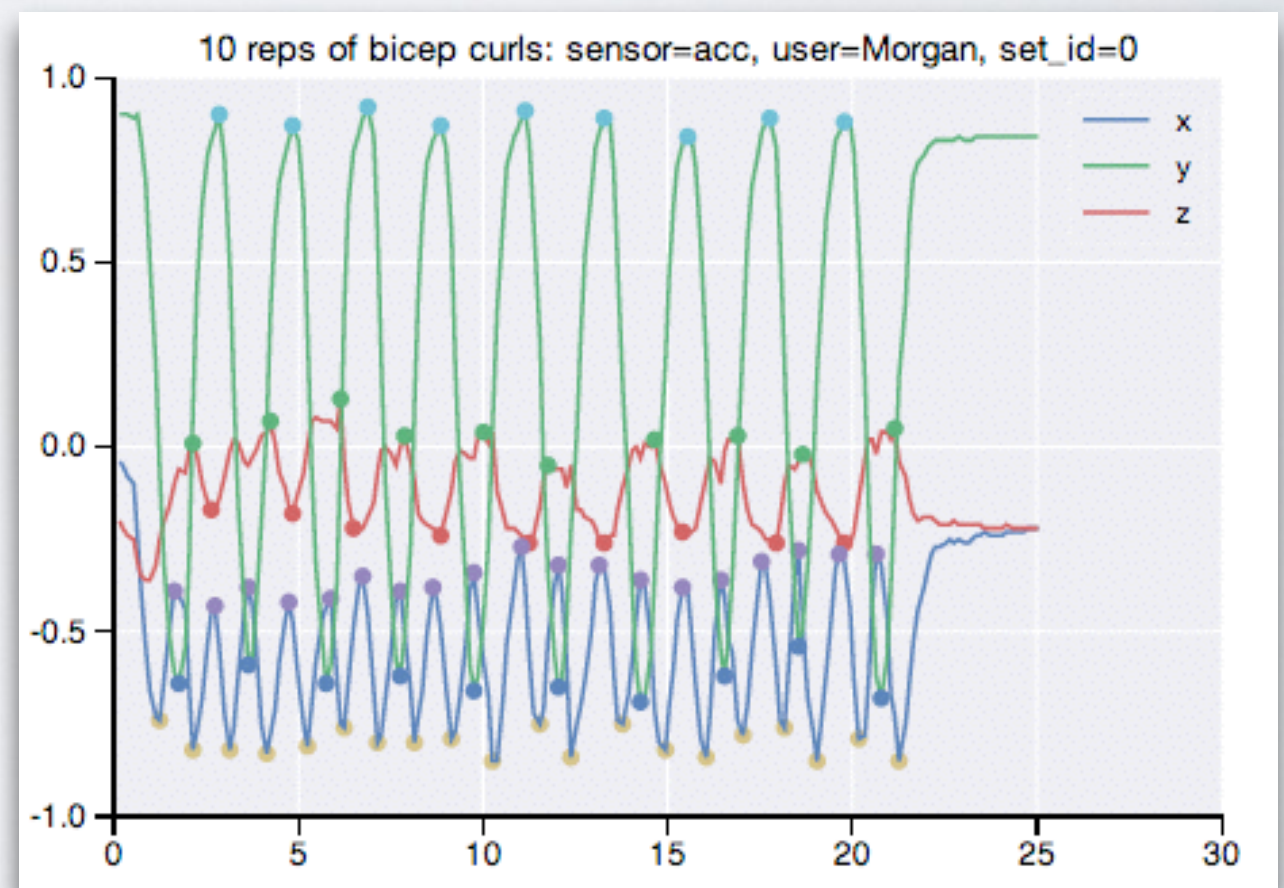


Classifying Exercises in Real-Time

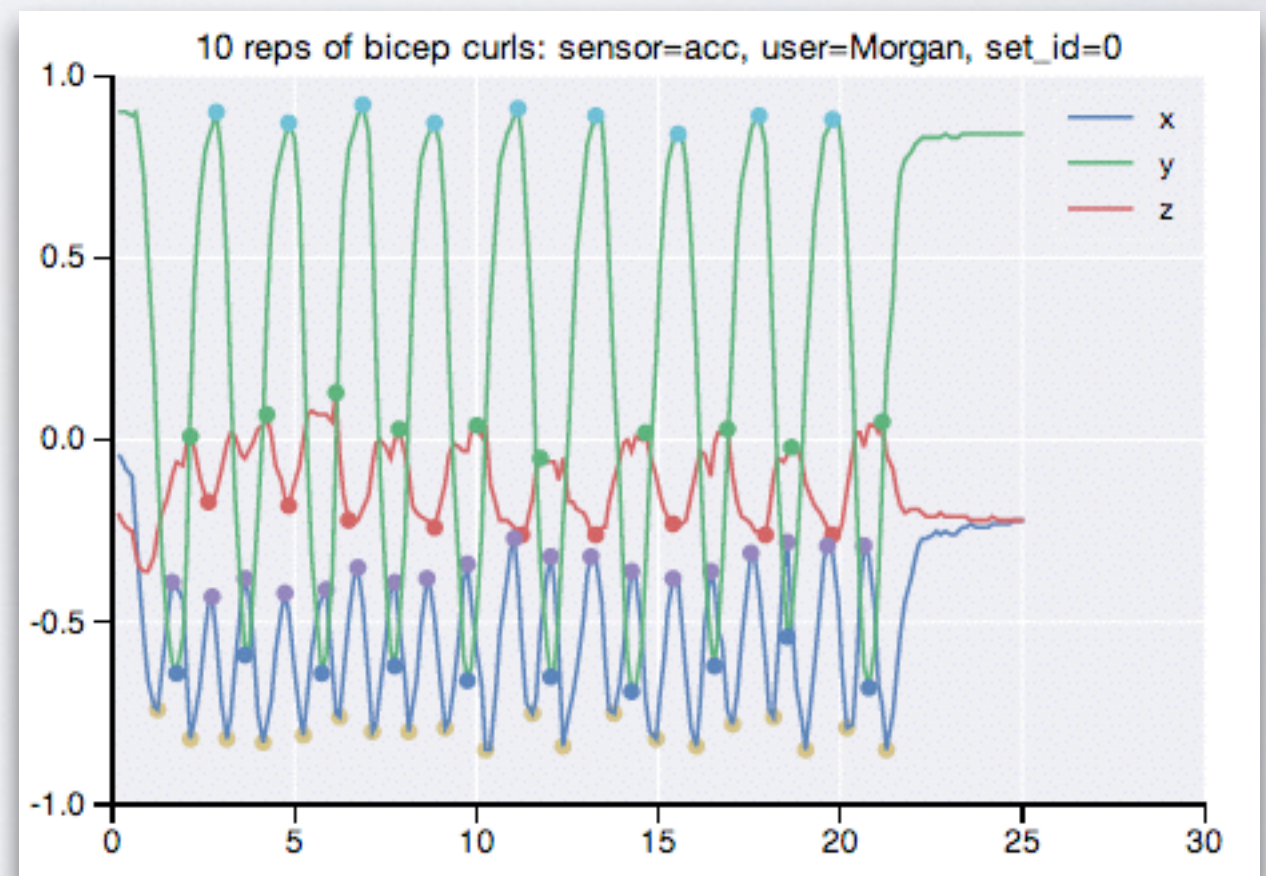
By Morgan Wallace

DATA

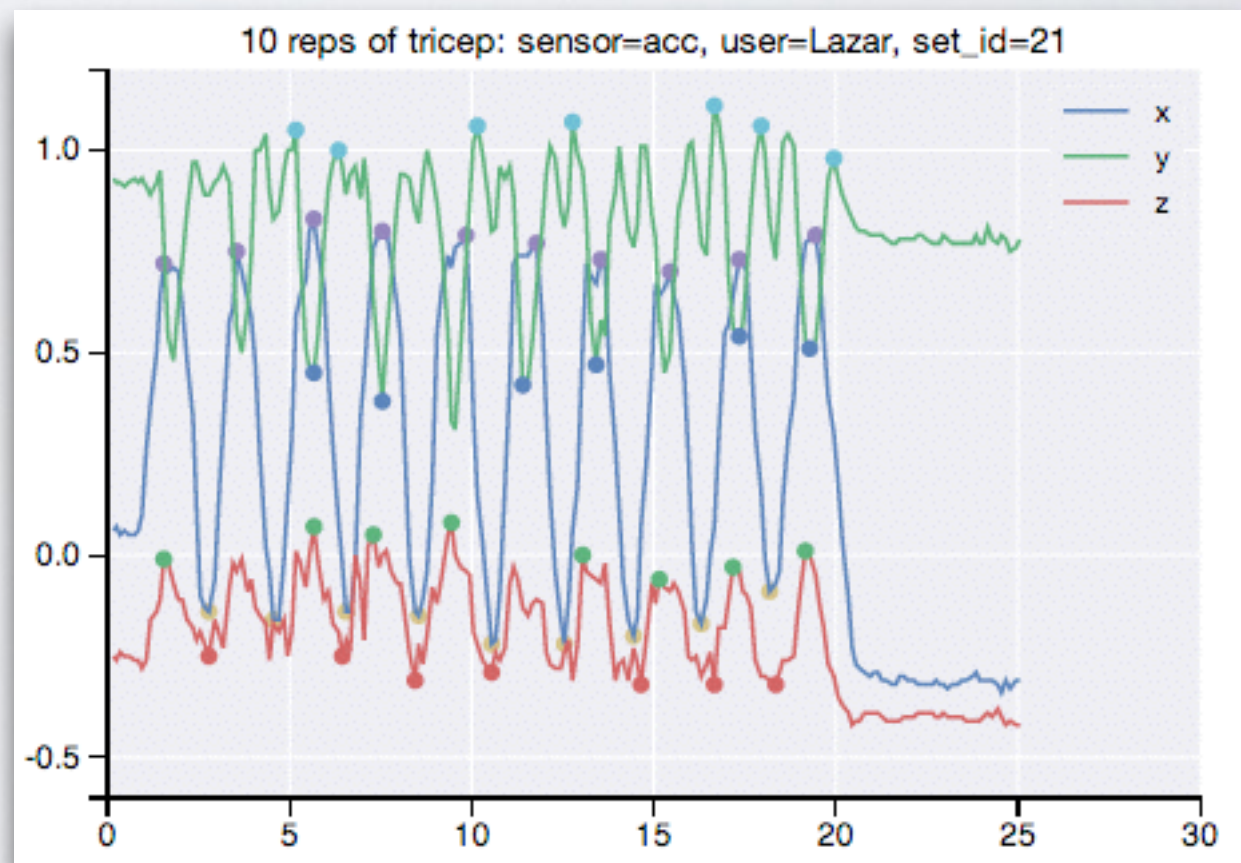
- What does a bicep curl look like to a computer?



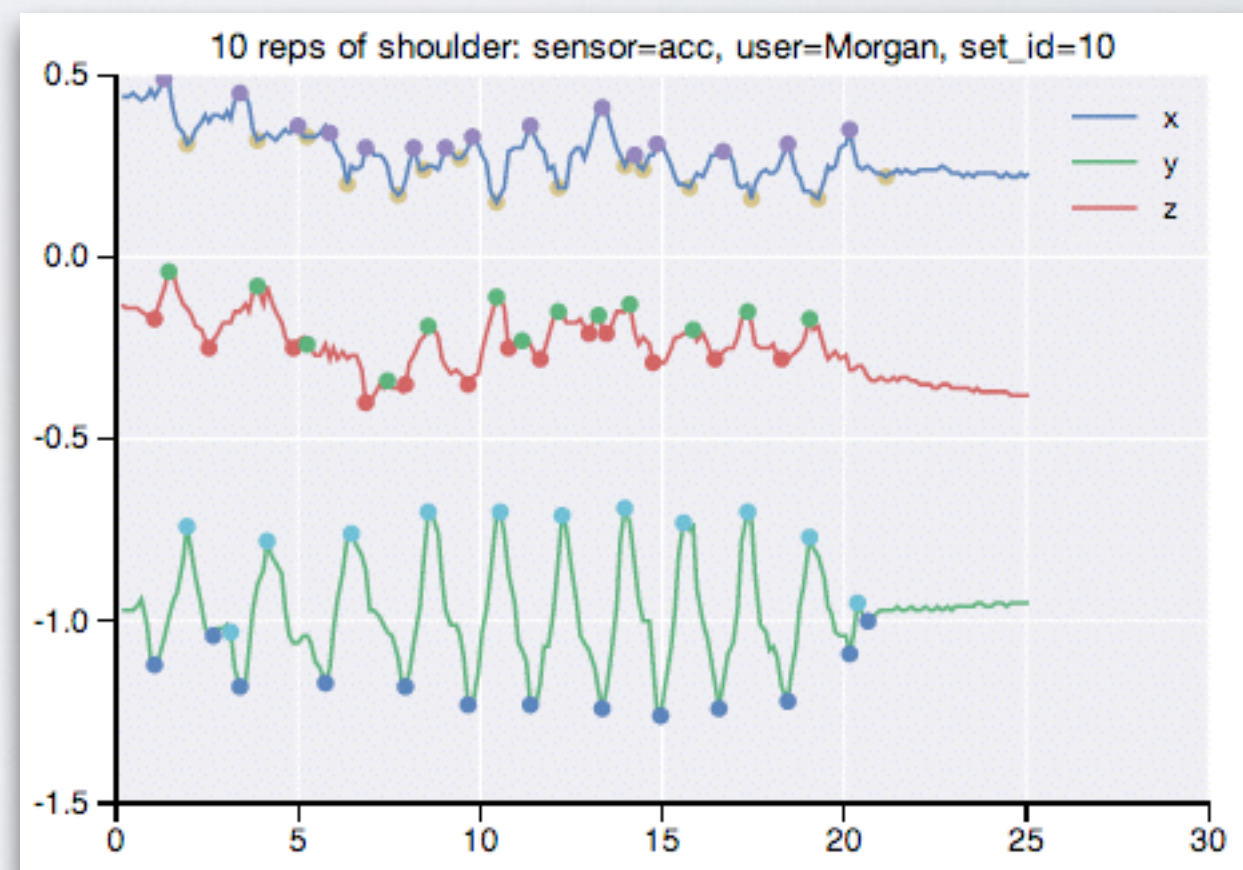
BICEP CURLS



TRICEP KICKBACKS

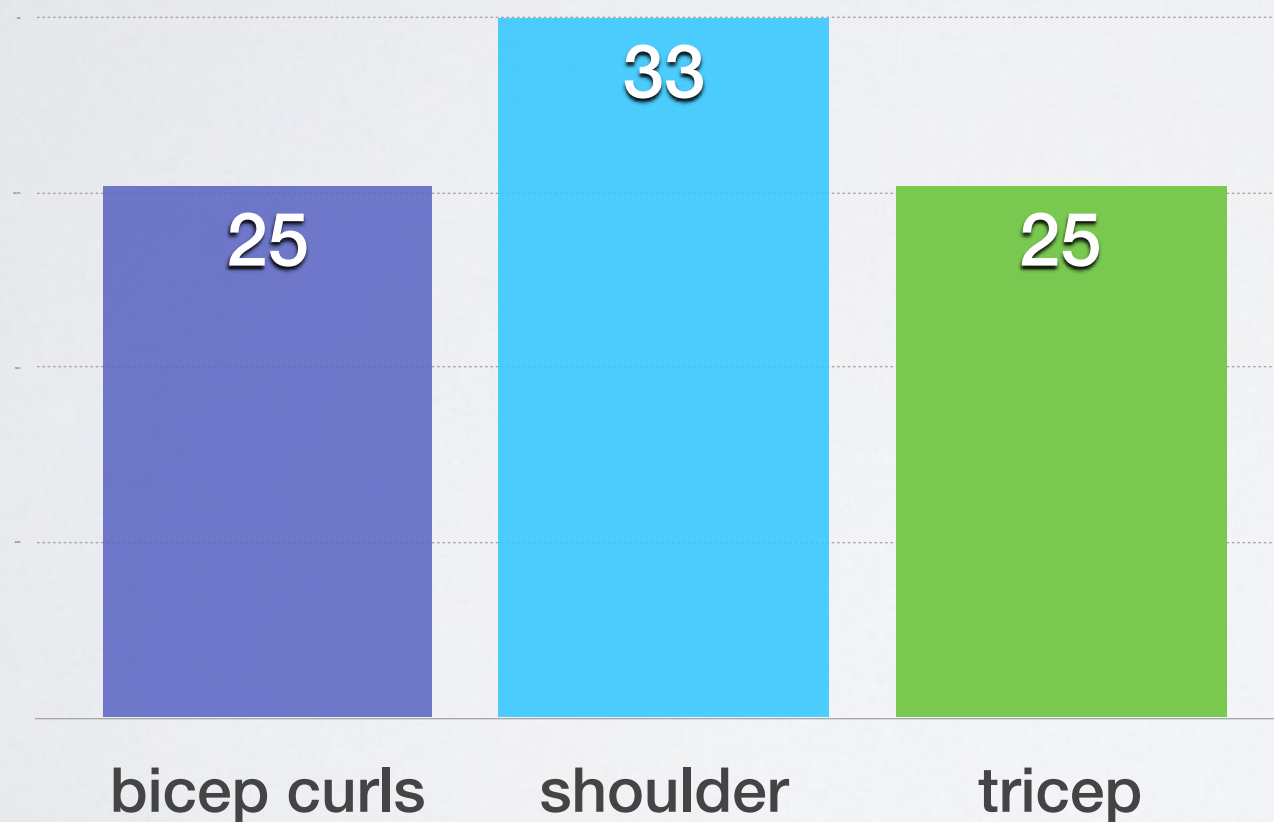


SHOULDER PRESS



DATA DESCRIPTION

83 Total Sets of Repetitions



9.5 average repetitions per set;

15 different people;
Overall- 16733 samples of raw sensor data

↓
{ 'magnet': (127.88, 559.36, -168.36), 'gyro':
(2011, 2612, 1406), 'accel': (-0.19, -0.84, -0.27),
'time': 1399510477.63 }

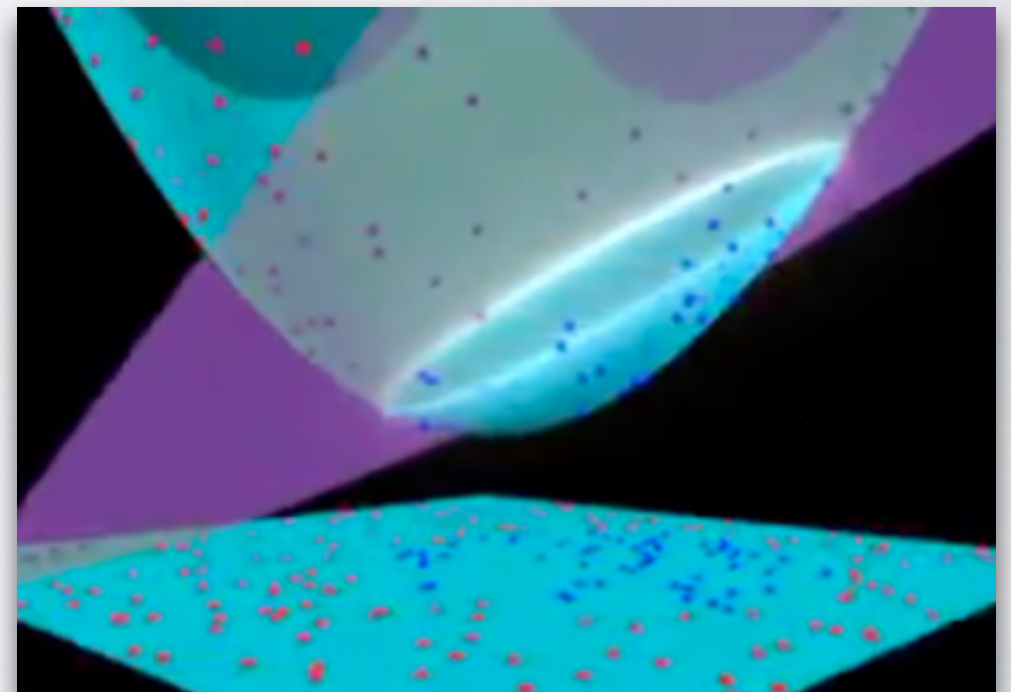
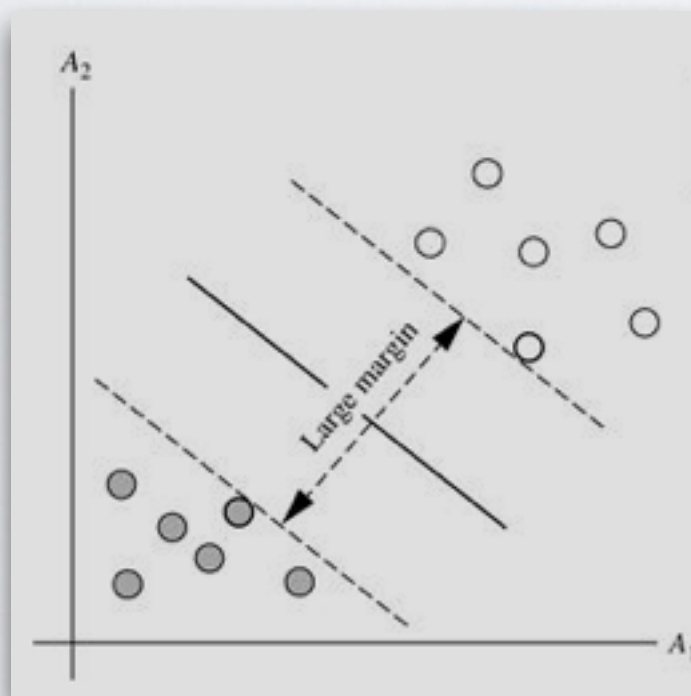
PROCESS

1. Import data
2. Clean data
3. Label it
4. Train classifier
5. Test classifier
6. Save for Hercubit

MY CLASSIFIER

SVM with linear & polynomial kernels

27 features and growing...



RESULTS

Linear Kernel

	precision	recall	f-1	support
Bicep	1.00	0.97	0.99	38
Shoulder	1.00	0.97	0.98	63
Tricep	0.94	1.00	0.97	47
avg/total	0.98	0.98	0.98	148

VS holdout set

	precision	recall	f-1
avg	0.88	0.88	0.88

IMPLEMENTATION

FUTURE WORK

1. Explore new features & optimize
2. Add more types of exercise
3. Integrate training with Hercubit front-end