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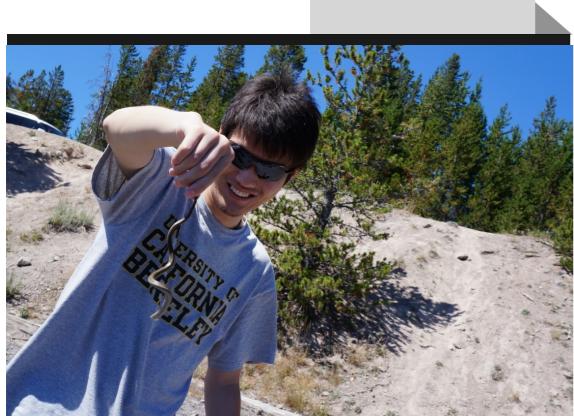
**Yanming Chen, Jiarong Fu
Brian Kim & PJ Loury**

CS149 FINAL PROJECT @ UC BERKELEY



ABOUTUS.

MEET OUR TEAM



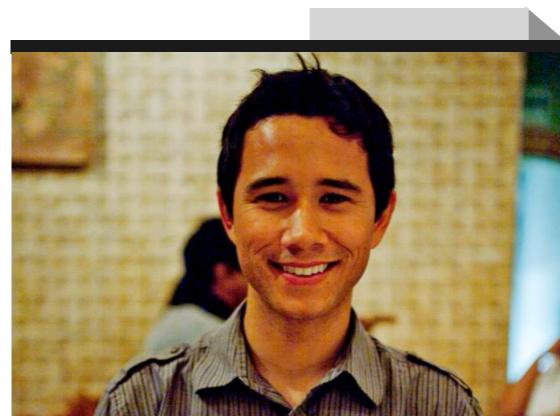
Yanming

Junior



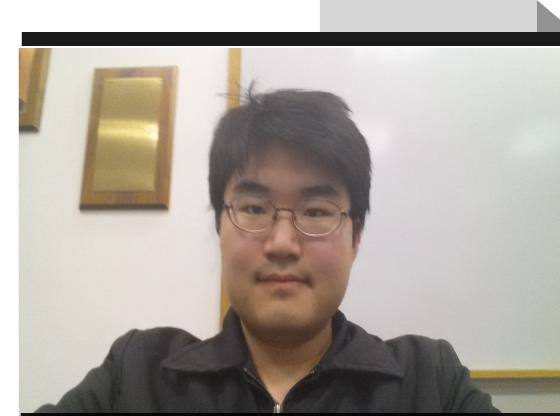
Jiarong Fu

Master Student



PJ Loury

Master Student



Brian Kim

Sophomore Student Major in EECS

START
Inverse Kinematics

ABOUTUS
The Team

MISSION
Project Spec.

TECH. CORE
Alg. etc.

DEMO
Results showcase

FUTURE
Further dev.

QUESTIONS
or thank you



OURMISSION.

Project Specification and Features

“To construct a device
to remotely control a
computer using only
gestures”

Gesture Bracelet Control.

A Machine Learning Classification Approach



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Project Specification and Features

Gesture Bracelet Control.

A Machine Learning Classification Approach



- Small, wearable Form Factor
- Long Battery Life
- Accurate Gesture Recognition
- Machine Learning/Classification



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Project Specification and Features

Gesture Bracelet Control.

A Machine Learning Classification Approach



- Arduino micro-controller drives the device and coordinate accelerometer and bluetooth module
- On board brain for data packaging and formatting
- Interface of Embedded world and computer interaction



- A stable and clear channel for data communication
- Reliable and noise-free broadcaster, easily accessible on common computers
- A fast communication channel to minimize transmission latency



- Provide a more accurate way of processing incoming data
- A solution to control the state of recognizer so that it only responds to signal when it should
- More flexible and efficient for debugging and diagonalizing



- A strong classifier that is able to largely improve the accuracy of recognition
- Provide a more generic way of processing input signal and improve efficiency

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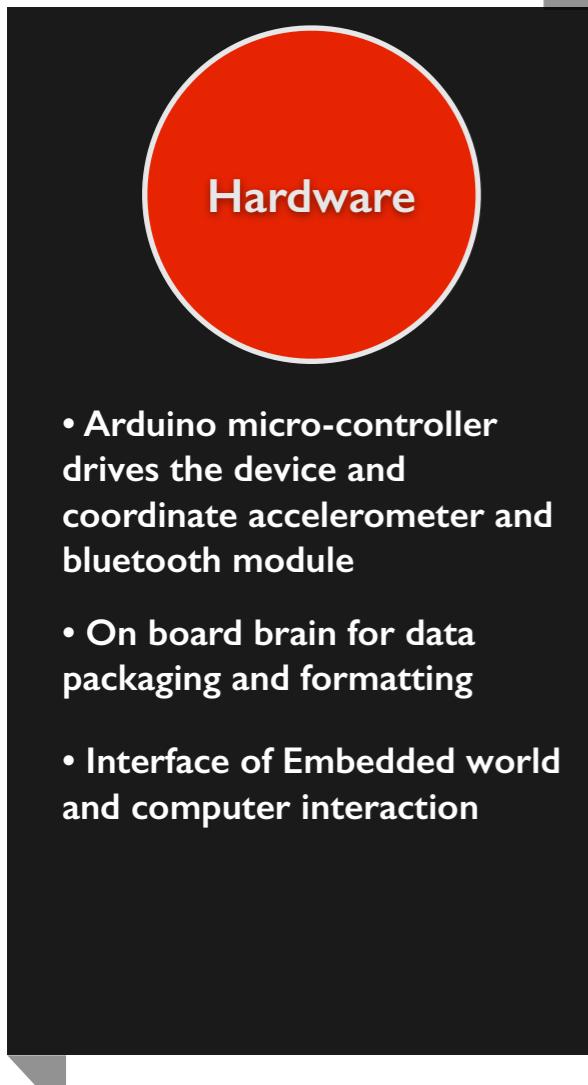
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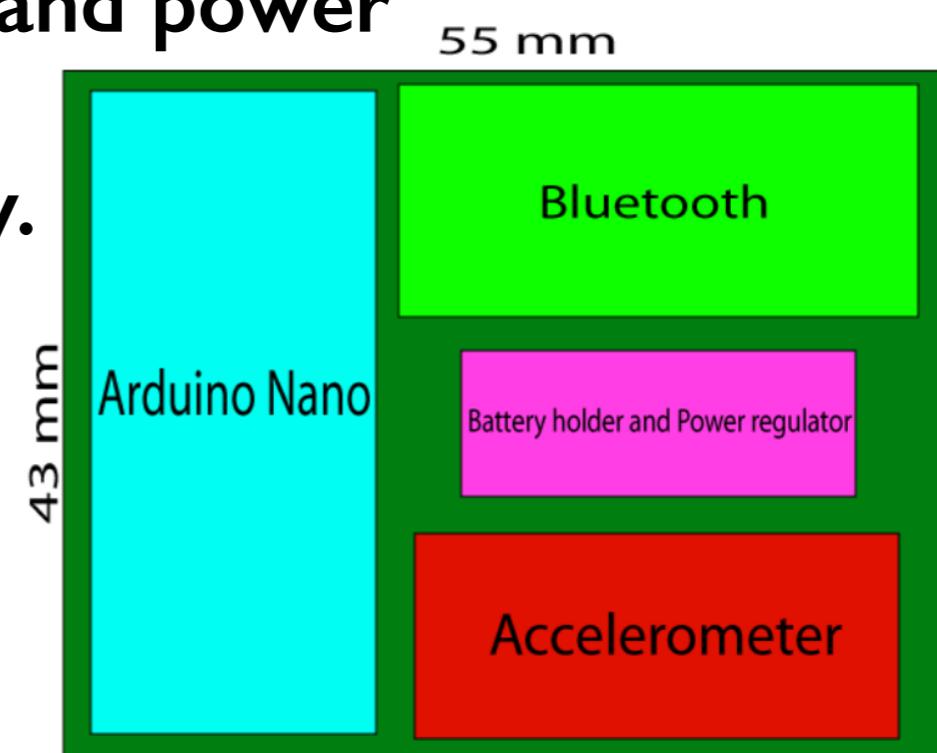


TechnicalCore.

Key Ideas and Algorithms



- Battery, Bluetooth, Arduino Nano, and accelerometer on one board.
- Wires, resistors, capacitor, and power regulator added as needed.
- Tape used to secure battery.



TechnicalCore.

Key Ideas and Algorithms

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Arduino Nano



FreeScale
MMA7455



JY MCU
HC-06

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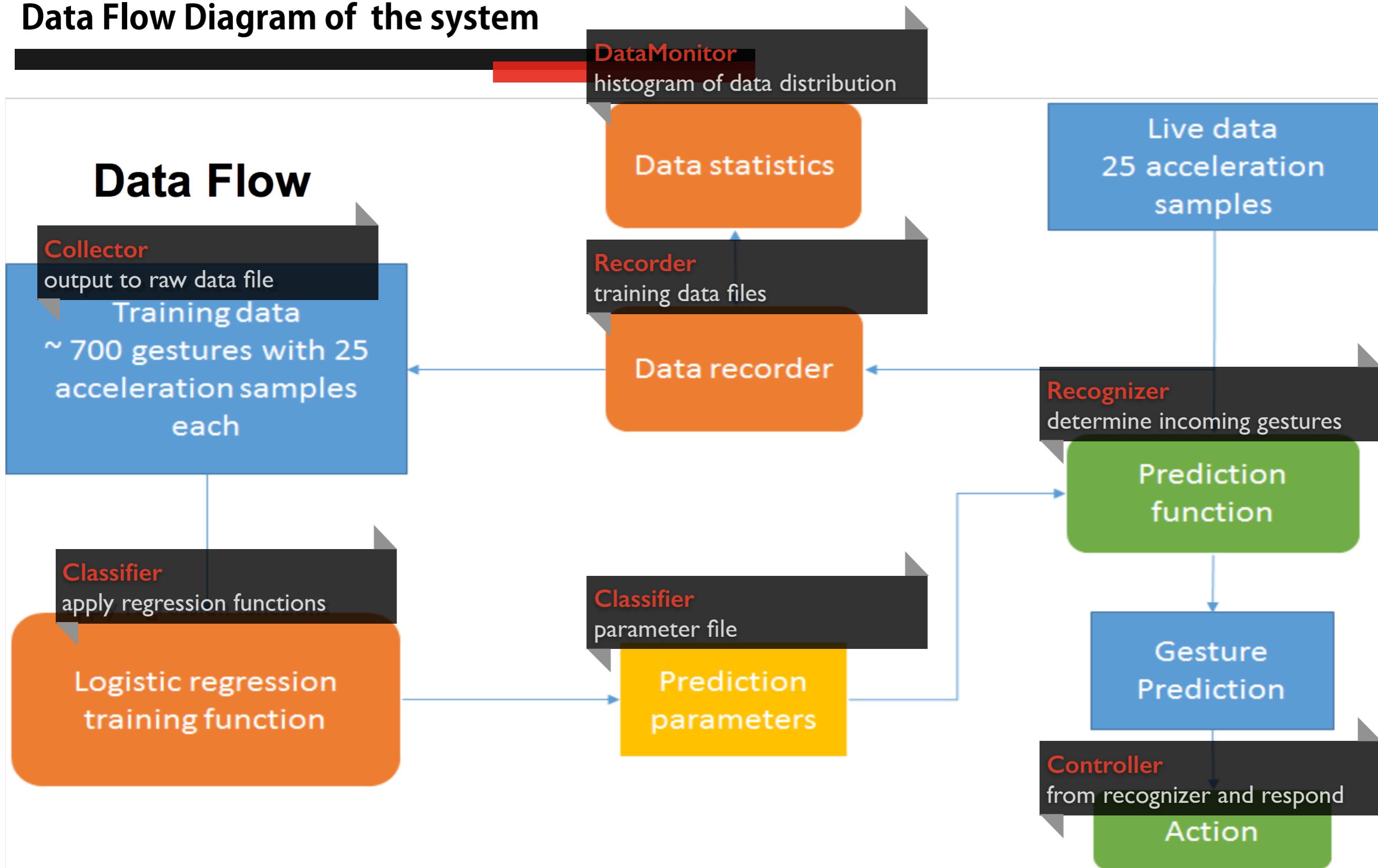
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Data Flow Diagram of the system



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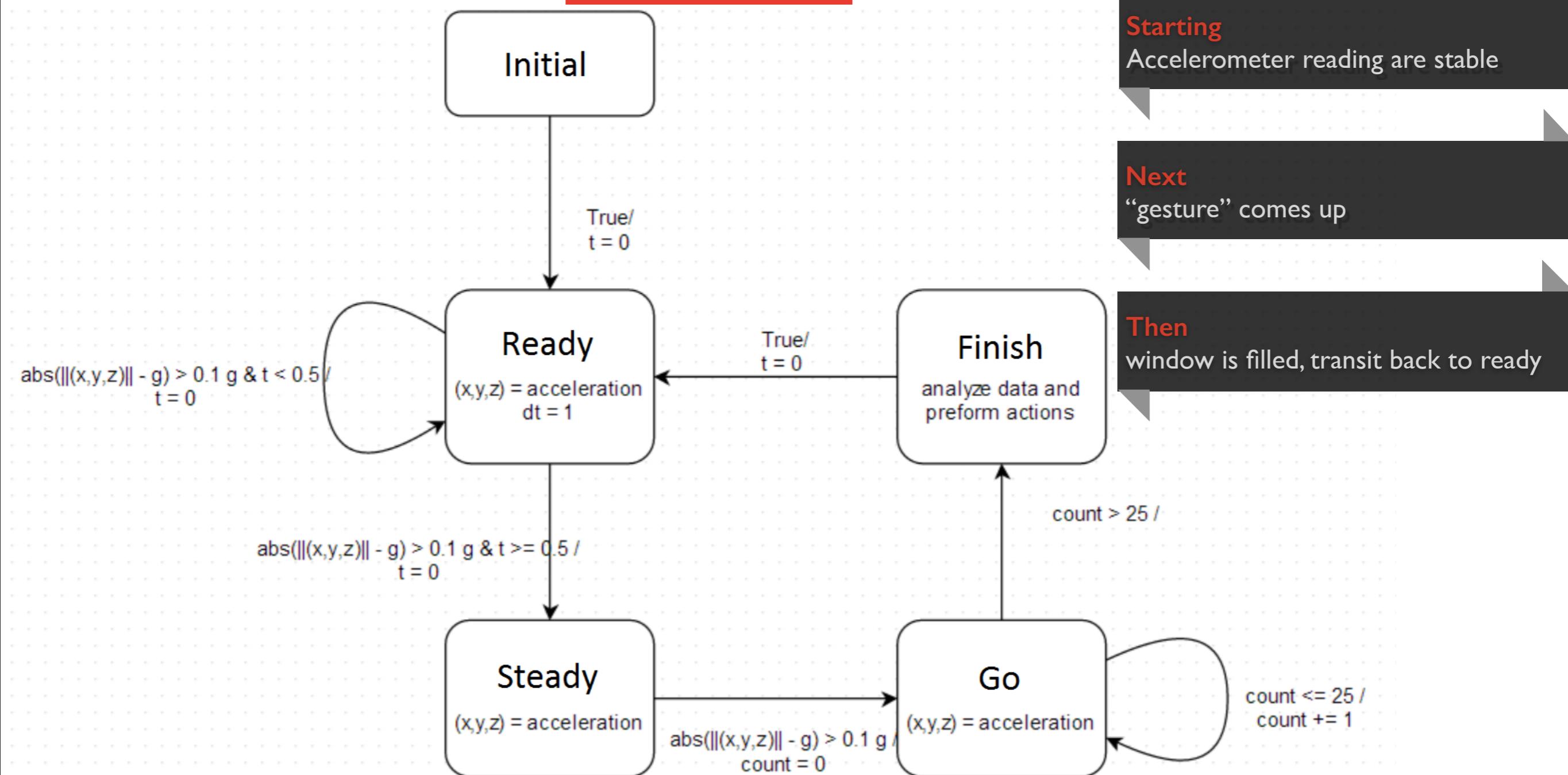
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Finite State Machine (FSM) of the Recognizer



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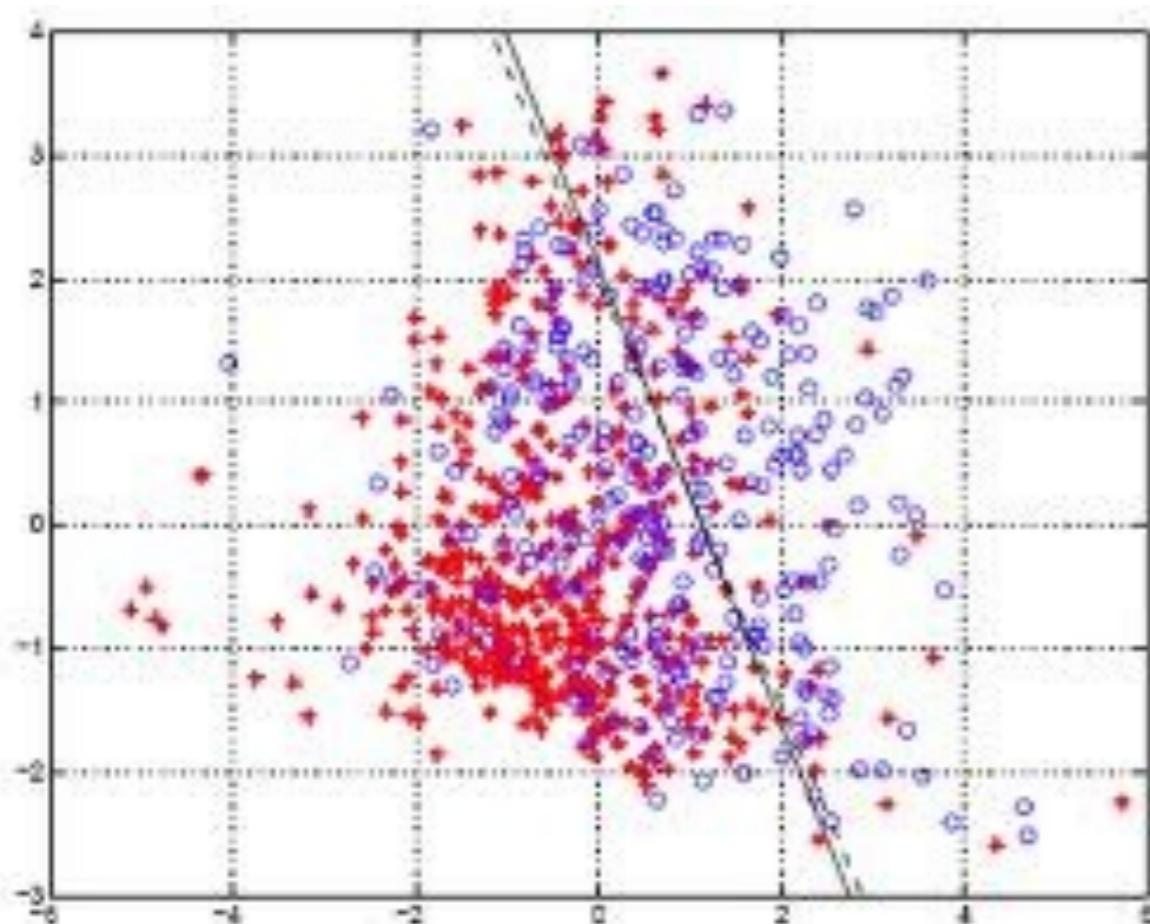
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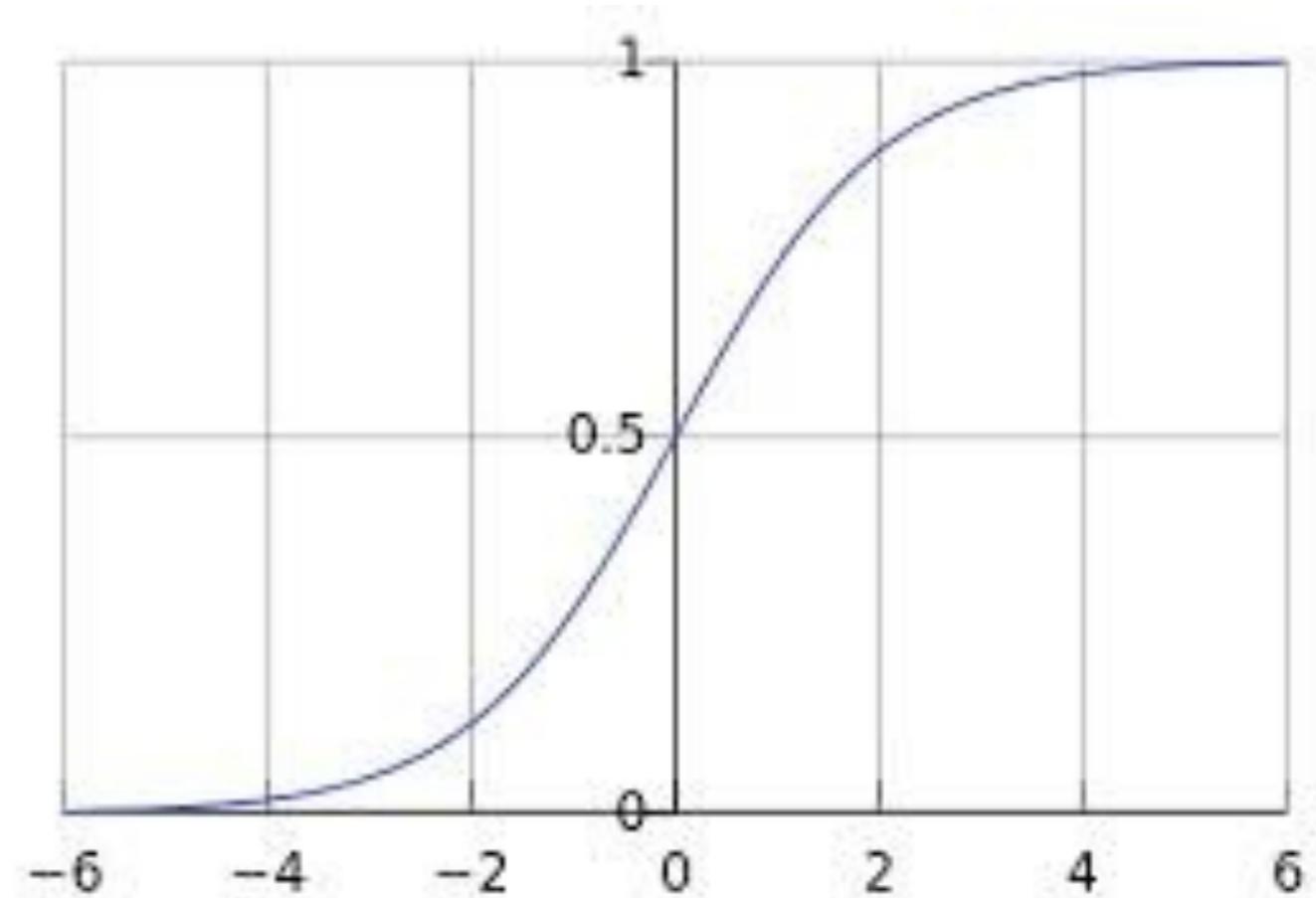
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Linear Logistic Regression (LLR)



logistic: <https://encrypted-tbn2.gstatic.com/images?q=tbn:ANd9GcRPAhrx3Iv5NOWHGuwLFHgvVBmAut1cVR5cCsf-HvDdO7kiW3H3A>

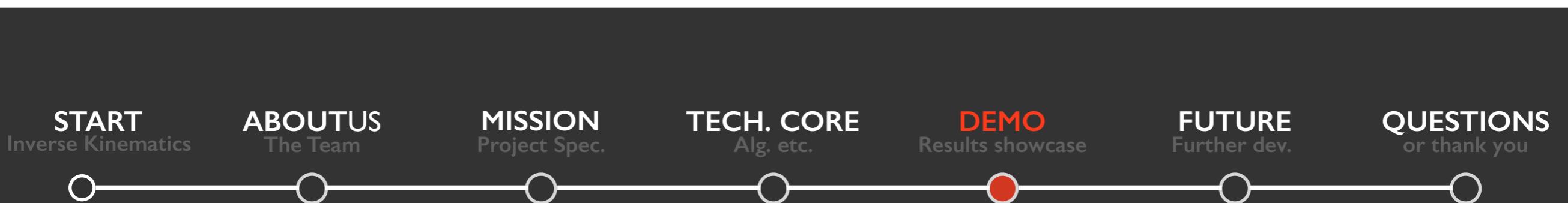


sigmoid: <en.wikipedia.org>

Application Demo.

Demonstration Showcase - Our results

Gesture Bracelet Control.
A Machine Learning Classification Approach



Code Repository at



<http://github.com/pjloury/wristband>

Check us out!



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Acknowledgement

Further Features and Optimizations

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A Machine Learning Classification Approach

- Moritz Kemper, IAD Physical Computing Lab in ZhDK
- Brian Friedman and Sambhav Galada(CEO and CTO of Loopd)
- Michael Andersen (Berkeley CS PhD Candidate)

References

- MMA7455 Library: <https://code.google.com/p/mma-7455-arduino-library/>
- Scipy Library: Author: Eric Jones, Travis Oliphant, Pearu Peterson and others.
- Chronos watch python tool: Author: “Wolfmankurd” on GitHub.
<https://github.com/wolfmankurd/eZ430-tools>



Thank you.

