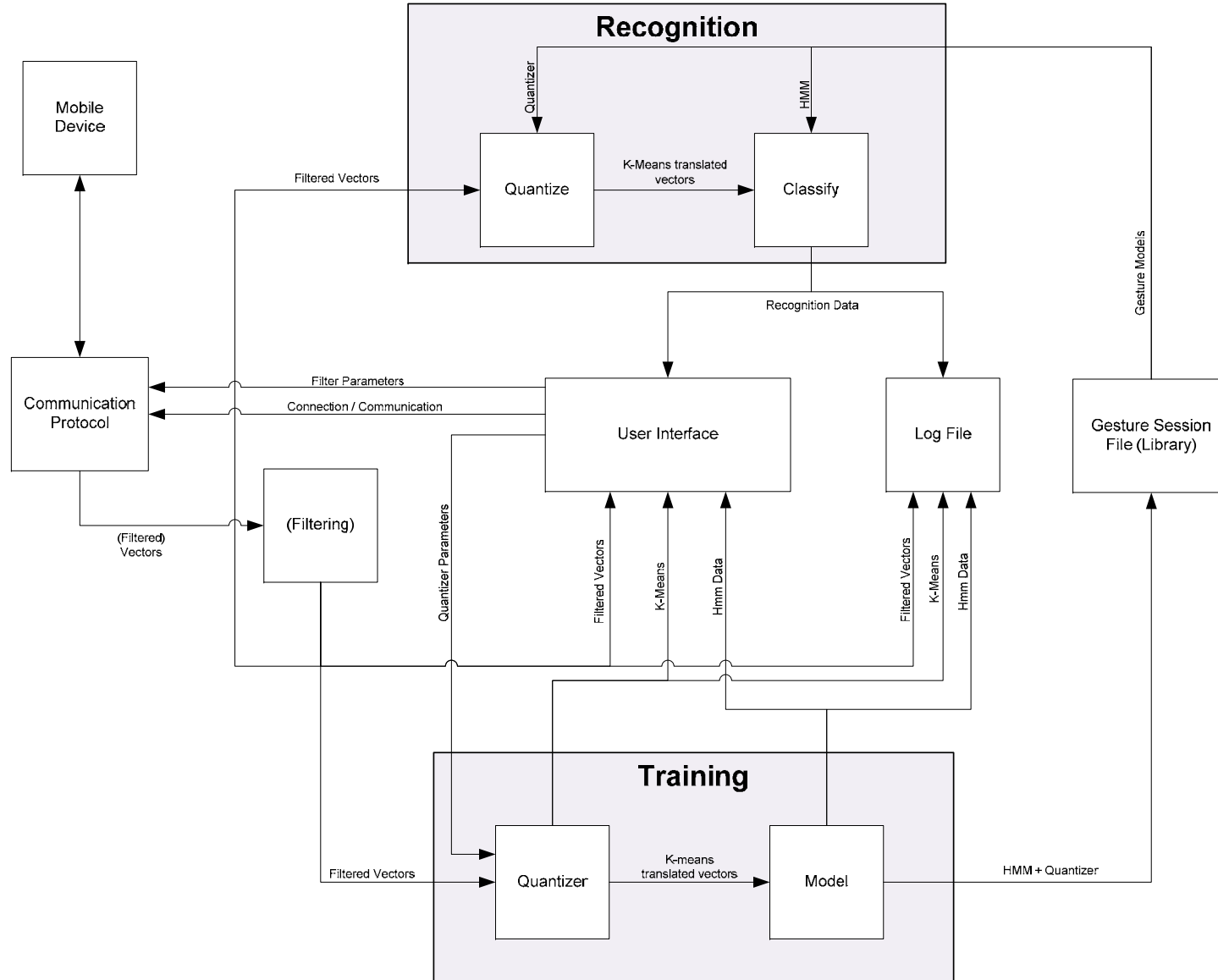


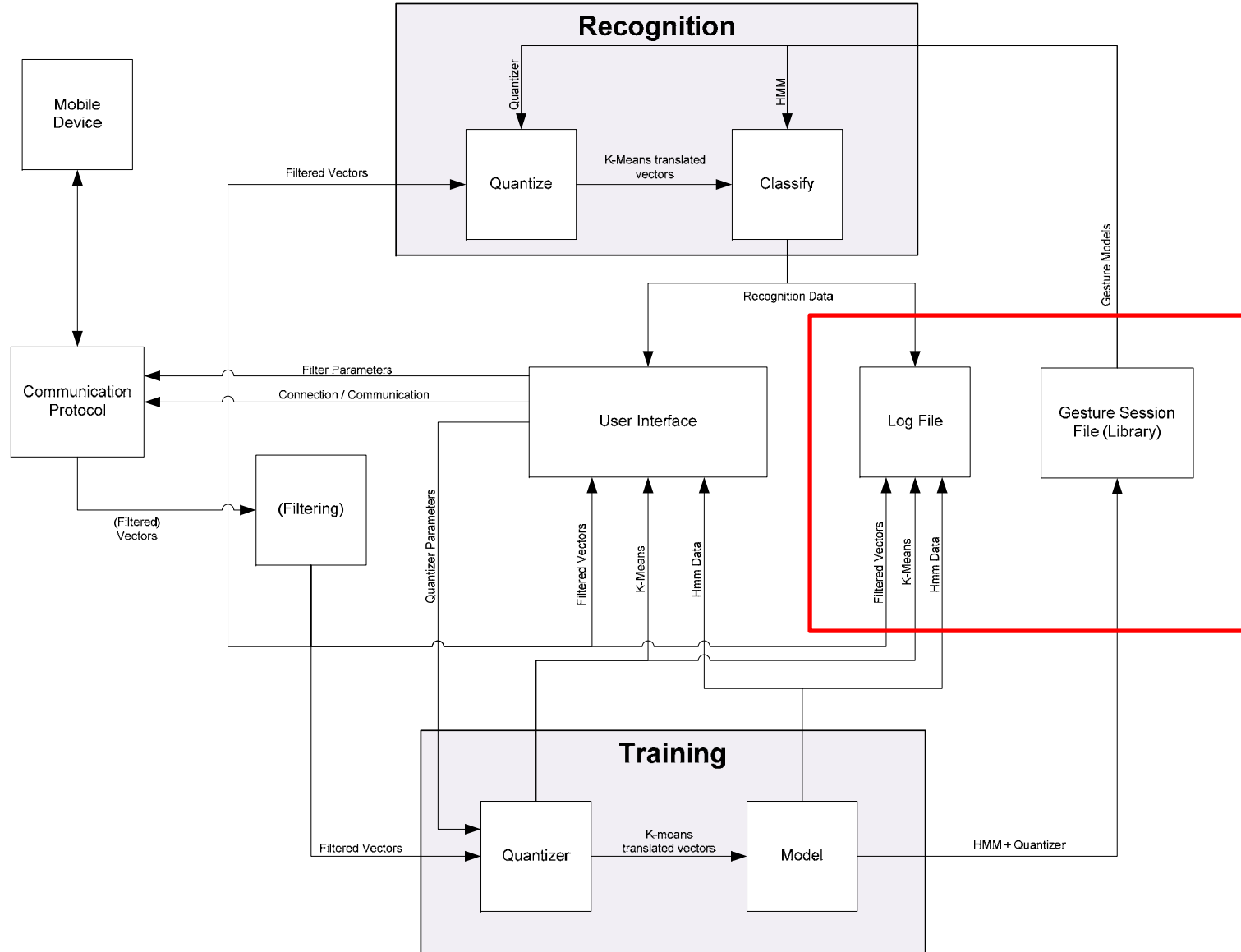
Design Doc Presentation

-talk about purpose of presentation

System Architecture



Log and Save File



Log and Save File

Saved gesture: packaged as serialized Gesture HMM

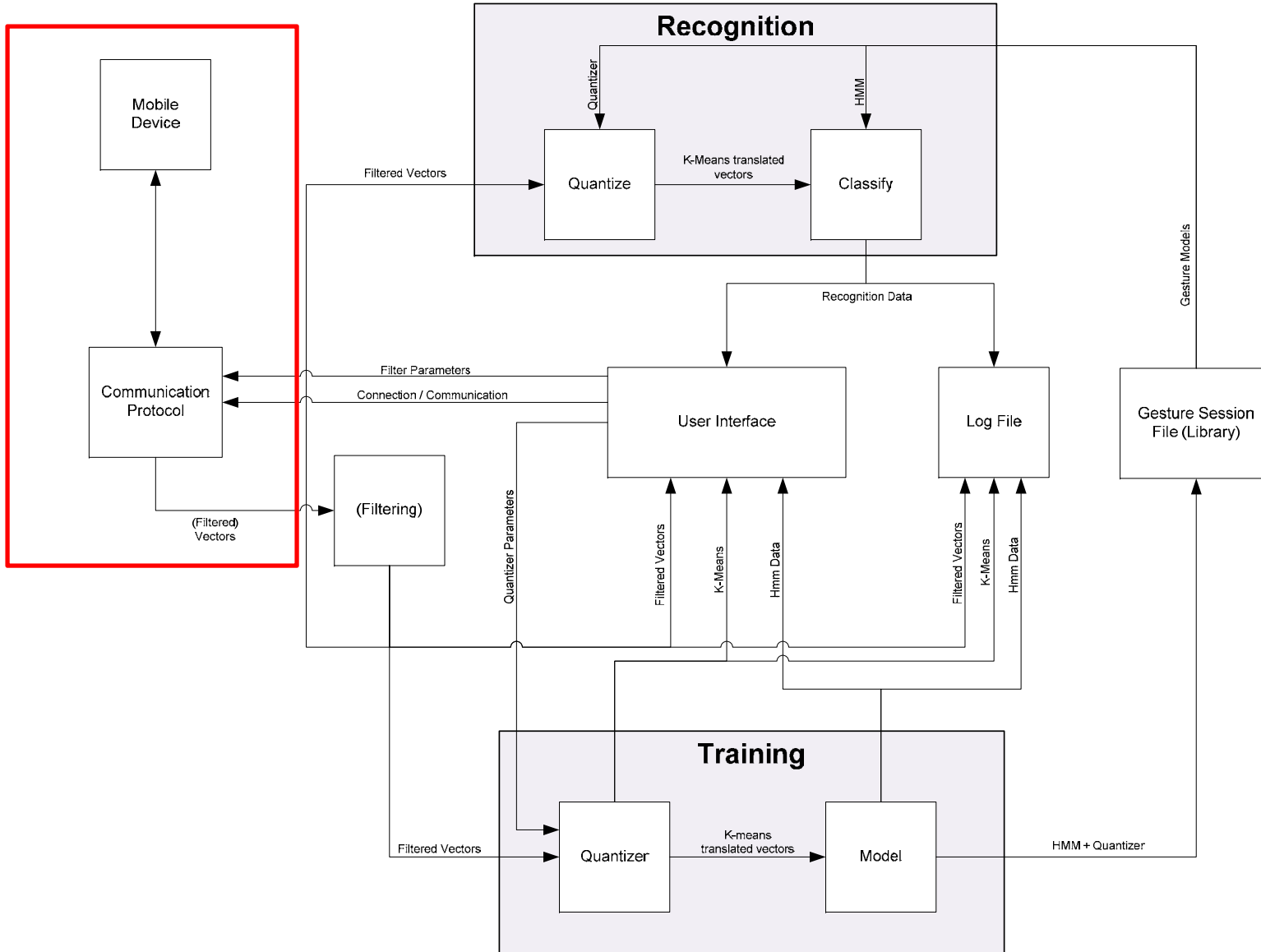
Three options: write to JTextArea, write to output file, or System.out.println

Log
+logClassifier : boolean(idl) = true +logFilters : boolean(idl) = true +logFROG : boolean(idl) = true +logHMM : boolean(idl) = true +logPlugins : boolean(idl) = true +logQuantizer : boolean(idl) = true +logSystemOut : boolean(idl) = true -txtOutput
+close() +out() +setLogFile() +setTextArea()

GestureHMM
-name : string(idl) -numStates -quantizer -trainingSet
-train() +getProbability() : double(idl) +getDefaultProbability() : double(idl)

Quantizer
-
+translate()

Mobile Communication



Mobile Communication

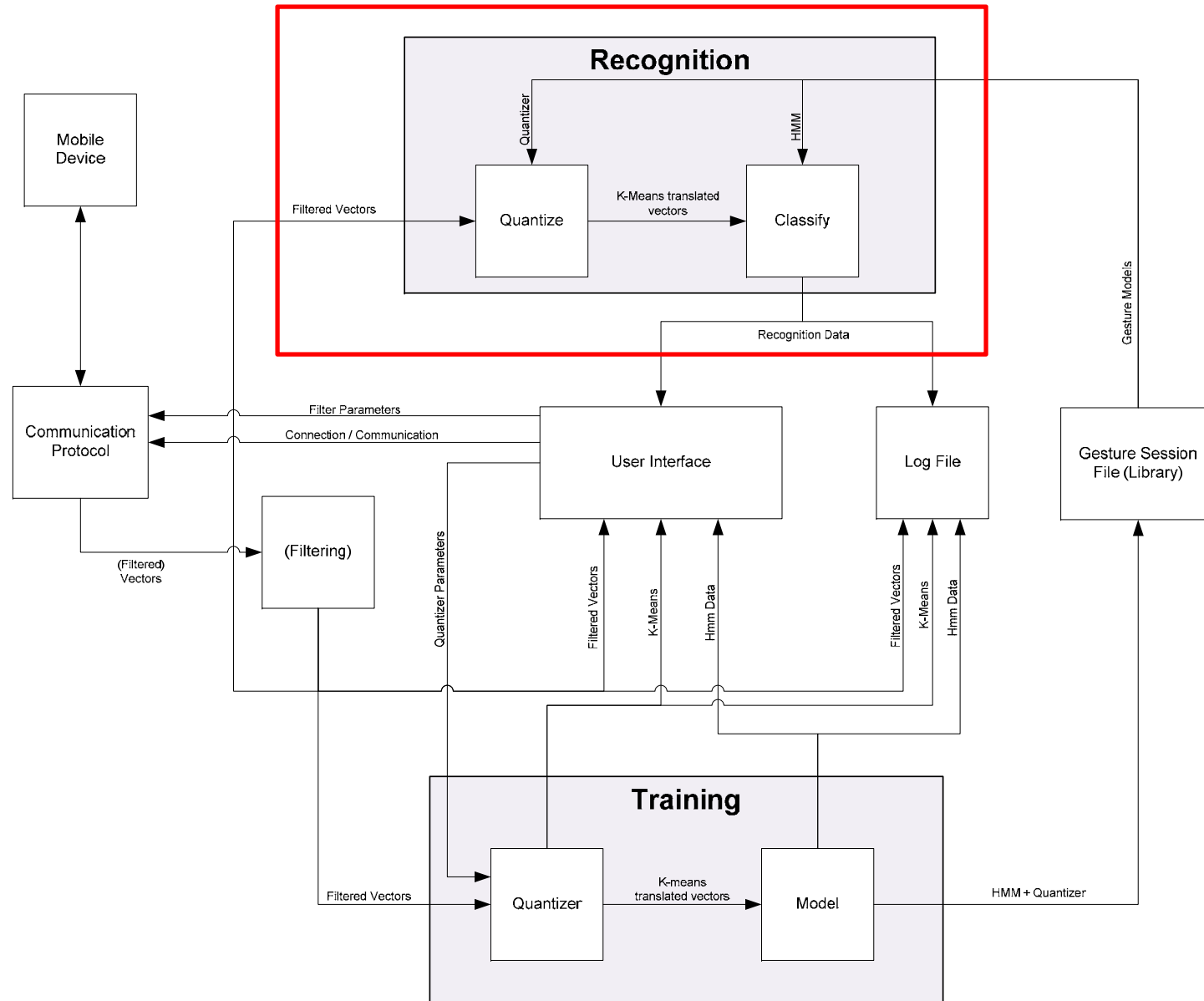
<i>Plugin</i>
-devices
+discover() +connect() +disconnect() +disconnectAll() +getConnectedDevices() +calibrate()

Device
-id -type -canFilter -filters
+calibrate() +addFilter() +removeFilter()

AccelEvent
-accelVector
+getAccel()

AccelVector
-x : float(idl) -y : float(idl) -z : float(idl)
+getX() : float(idl) +getY() : float(idl) +getZ() : float(idl)

Recognition Pipeline



Recognition Pipeline

RecognitionPipeline
-device -gestureSession -currentGesture -models
+accelerationReceived() +buttonPressed() +buttonReleased() +setDevice() +setSession()

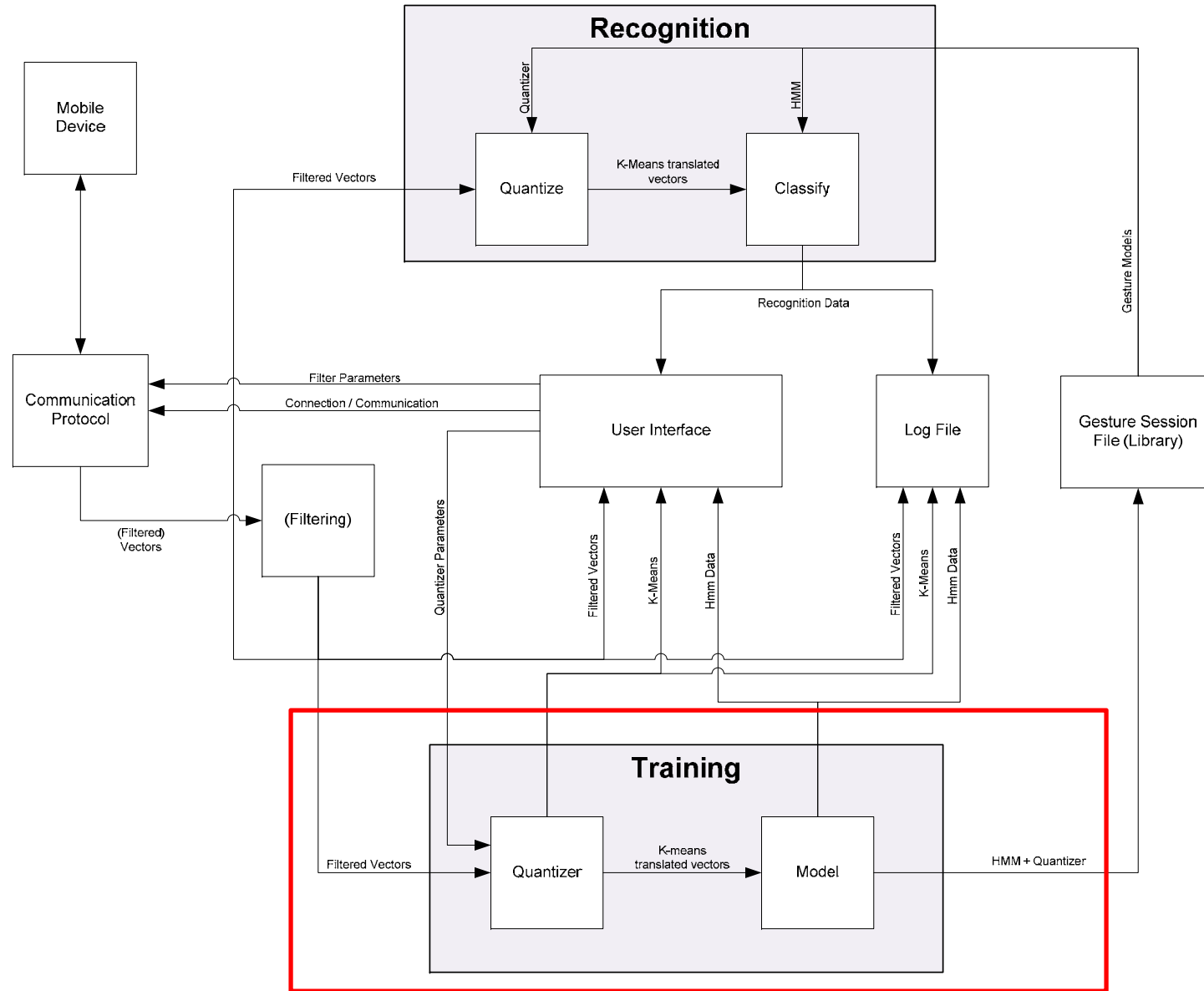
Filter
+filter()

Classifier
-model
+classify()

Quantizer
-
+translate()

GestureHMM
-name : string(idl) -numStates -quantizer -trainingSet
-train() +getProbability() : double(idl) +getDefaultProbability() : double(idl)

Training Pipeline



Training Pipeline

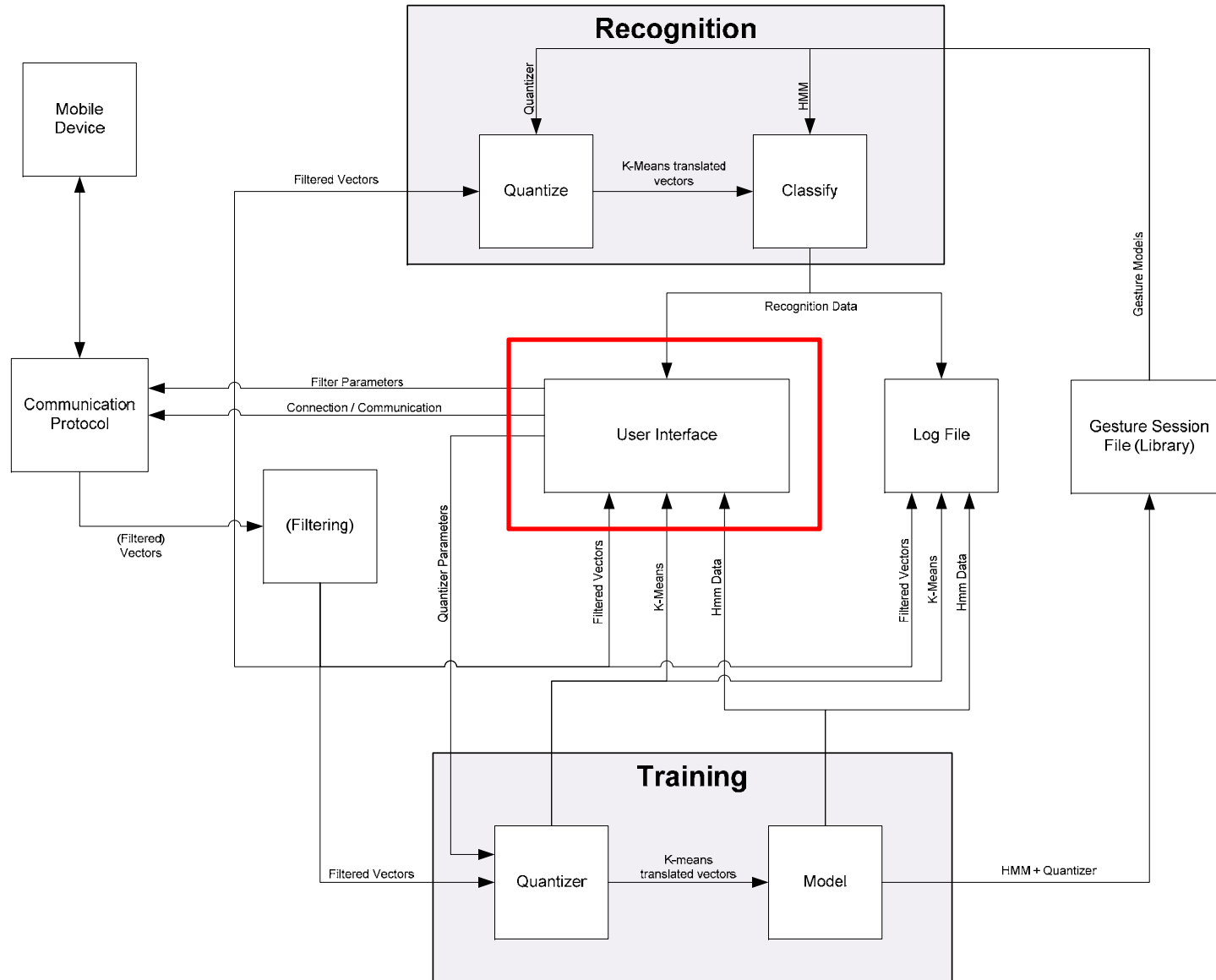
TrainingPipeline
-device -trainingSession -trainingSet -trainingInstance -quantizers -models
+accelerationReceived() +buttonPressed() +buttonReleased() +setDevice() +setSession()

<i>Filter</i>
+filter()

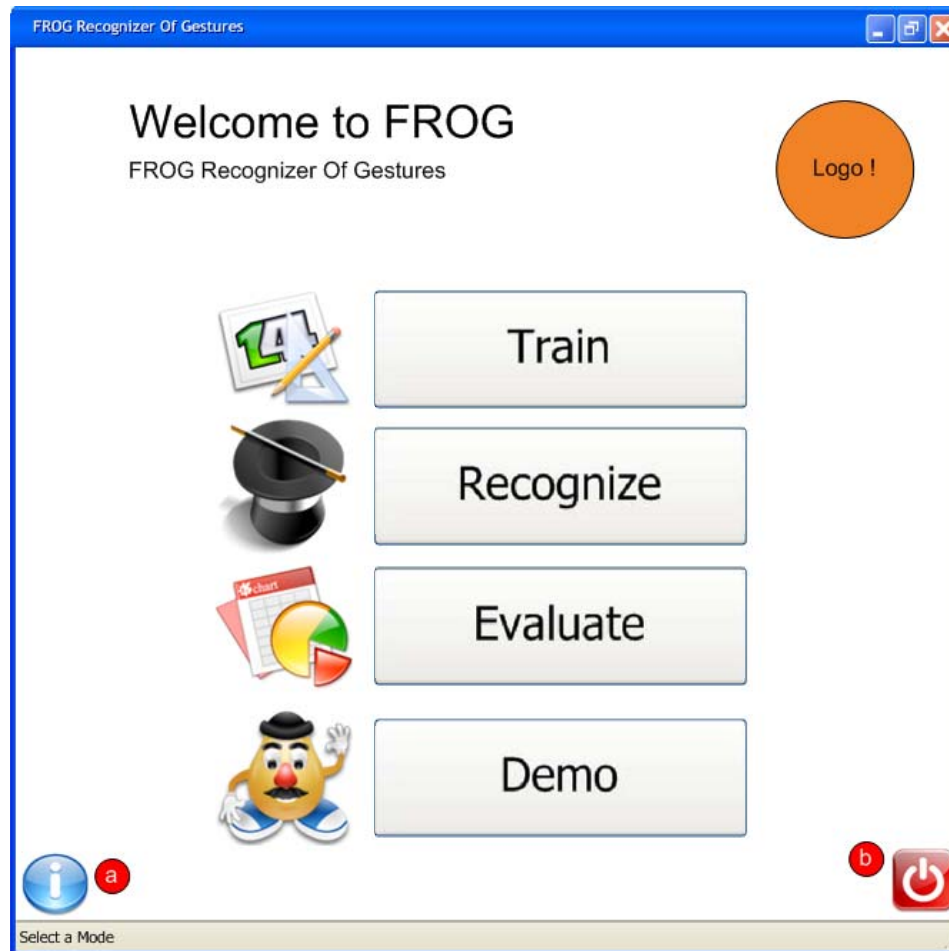
<i>Quantizer</i>
-
+translate()

GestureHMM
-name : string(idl) -numStates -quantizer -trainingSet
-train() +getProbability() : double(idl) +getDefaultProbability() : double(idl)

User Interface



User Interface



Training Window

FROG Recognizer Of Gestures - Training

Parameters

Sampling Freq.
Quantizer K-Value
Hmm # States

Device Set Up

Device: SunSPOT 2C06
Threshold: 0.25

Session Controls

Vectors Display | **Other Graphical Display**

3D Coordinate System: z-axis labeled M_z , x-axis labeled B_1 , y-axis. Coordinates: X = 1.2563, Y = 5.2365, Z = 2.8569.

Gesture Selection Table:

Circle		
Triangle		
Star	No Image	

Terminal Controls

Log Data
 (x,y,z) out
 Show Data 01
 Execution Time

Device Connected: Sunspot 3B7D
Status: Recording

Reading data from SunSPOT 3B7D

Recognition Window

FROG Recognizer Of Gestures - Recognition

Josh
Library: BasicShapes.ag
Device: SunSPOT 3B7D
Threshold: 0.25
Load New Library
Device Connected: SunSPOT 3B7D
Status: Recording

Ford
Library: RoundShapes.ag
Device: SunSPOT 2C06
Threshold: 0.25
Load New Library
Device Connected: SunSPOT 2C06
Status: Recording

Jose
Library: ComplexShapes.ag
Device: SunSPOT 415E
Threshold: 0.25
Load New Library
Device Connected: SunSPOT 415E
Status: Recording

Slot 04
Device: Select
Threshold: 0.25
Load New Library
No Device Connected
Status: Device Not Found

Terminal Window:

```
>Welcome !!
>Setting Recognition session...
>Slot 01 Device Connect: SunSPOT 3B7D
>Slot 02 Device Connect: SunSPOT 2C06
>Slot 03 Device Connect: SunSPOT 415E
>Slot 01 Loading Library: BasicShapes.ag - Session Started for: Josh
>Slot 02 Loading Library: RoundShapes.ag - Session Started for: Ford
>Slot 03 Loading Library: ComplexShapes.ag - Session Started for: Jose
>Starting Recognition session...
>
Ford >> Circle (99% certain)
>
Jose >> Gesture not recognized, sorry!
>
Josh>> Square (50% certain)
>
Jose>> Circle (20%)
```

Recognition session started...

Exit Recognition

Terminal Controls

- Log Data
- Communication Data
- Show Certainty of Rec.
- ...

Choose Log File

Terminal In New Window

Evaluation Window

Session Settings
Gesture Library Loaded: BasicShapes.ag
Load New Library Finish Evaluation Session

Customize Evaluation Session
Sample Size: 15 Randomize

Gesture	Correct	Incorrect	Av. Certainty
<input checked="" type="checkbox"/> Circle	12	0	50%
<input checked="" type="checkbox"/> Square	7	3	80%
<input type="checkbox"/> Star	--	--	--
<input checked="" type="checkbox"/> Triangle	3	1	75%

Recognition:
Triangle?
Ignore Last gesture

Device Set Up
Device: Sun Spot
Threshold: 0.25

Terminal Controls
 Log Data
 Communication Data
 Show Certainty of Rec.
 Execution Time

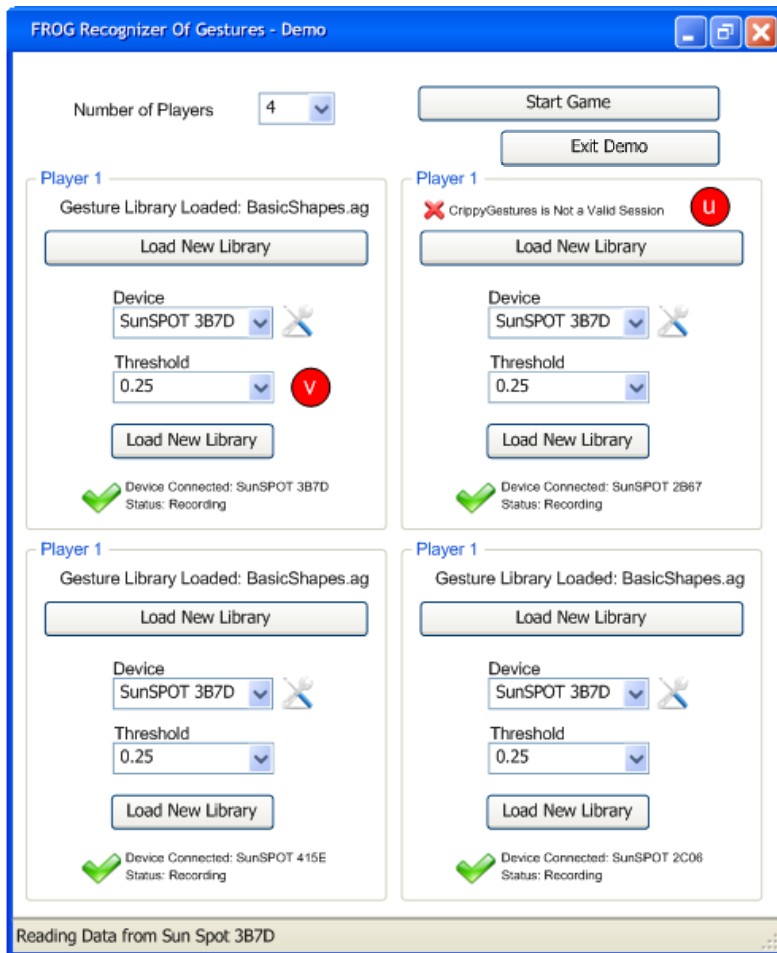
Device Connected: SunSPOT 3B7D
Status: Recording

Live Statistics
Correct - Incorrect - Unrecognized
 Live Statistics
Show in new window

```
>Welcome !!
>Setting Evaluation session...
>Device Connect: SunSPOT 3B7D
>ID: Josh
>Loading Gesture library [100%]
>Library Loaded: BasicShapes.ag
>Starting Evaluation session...\
>Gesture Recognized: triangle
>right !
>Gesture not recognized, sorry!
>Gesture Recognized: cirde
>wrong, sorry!
```

Reading Data from Sun Spot 3B7D

Demo Setup Window



External Terminal

