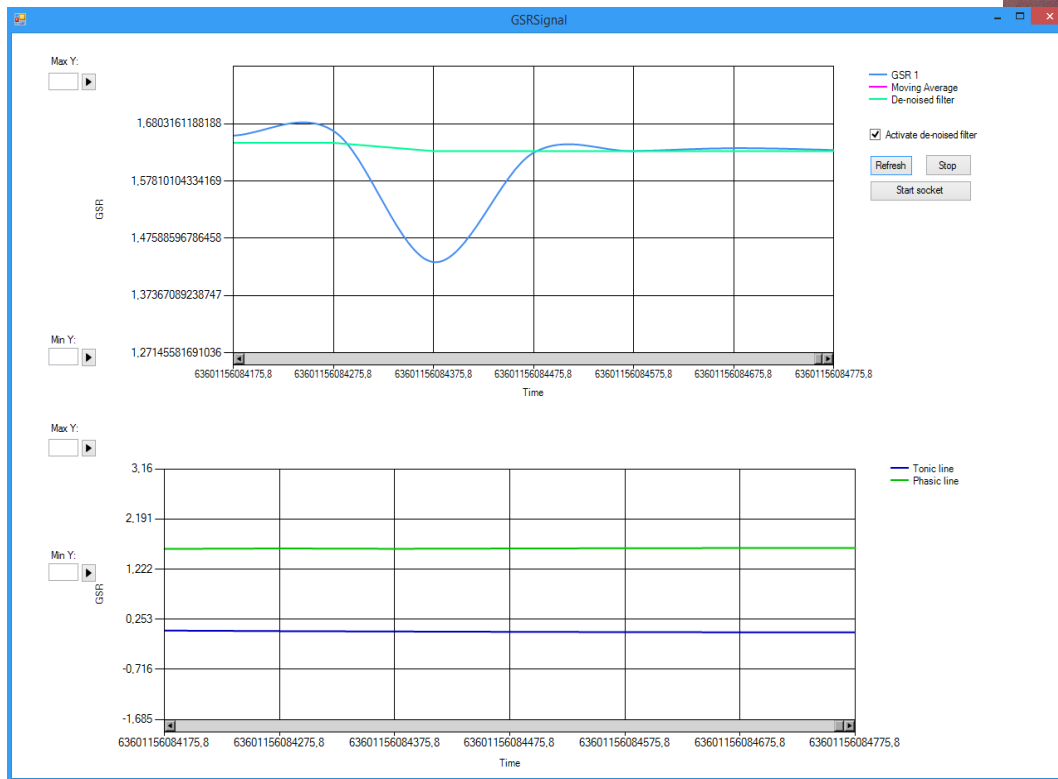
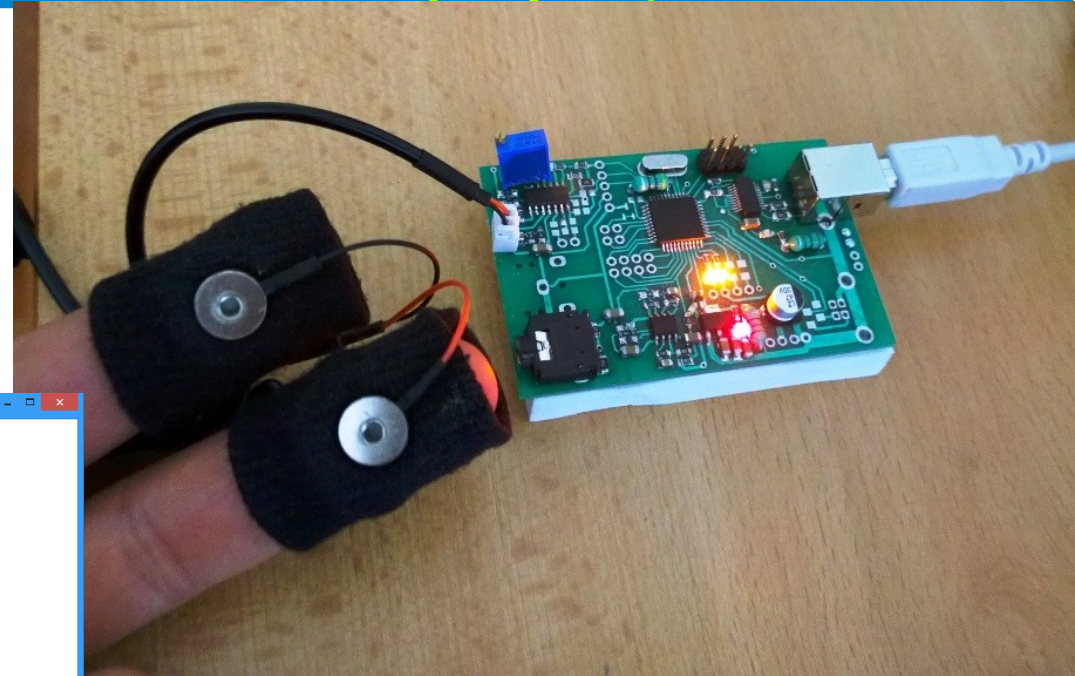
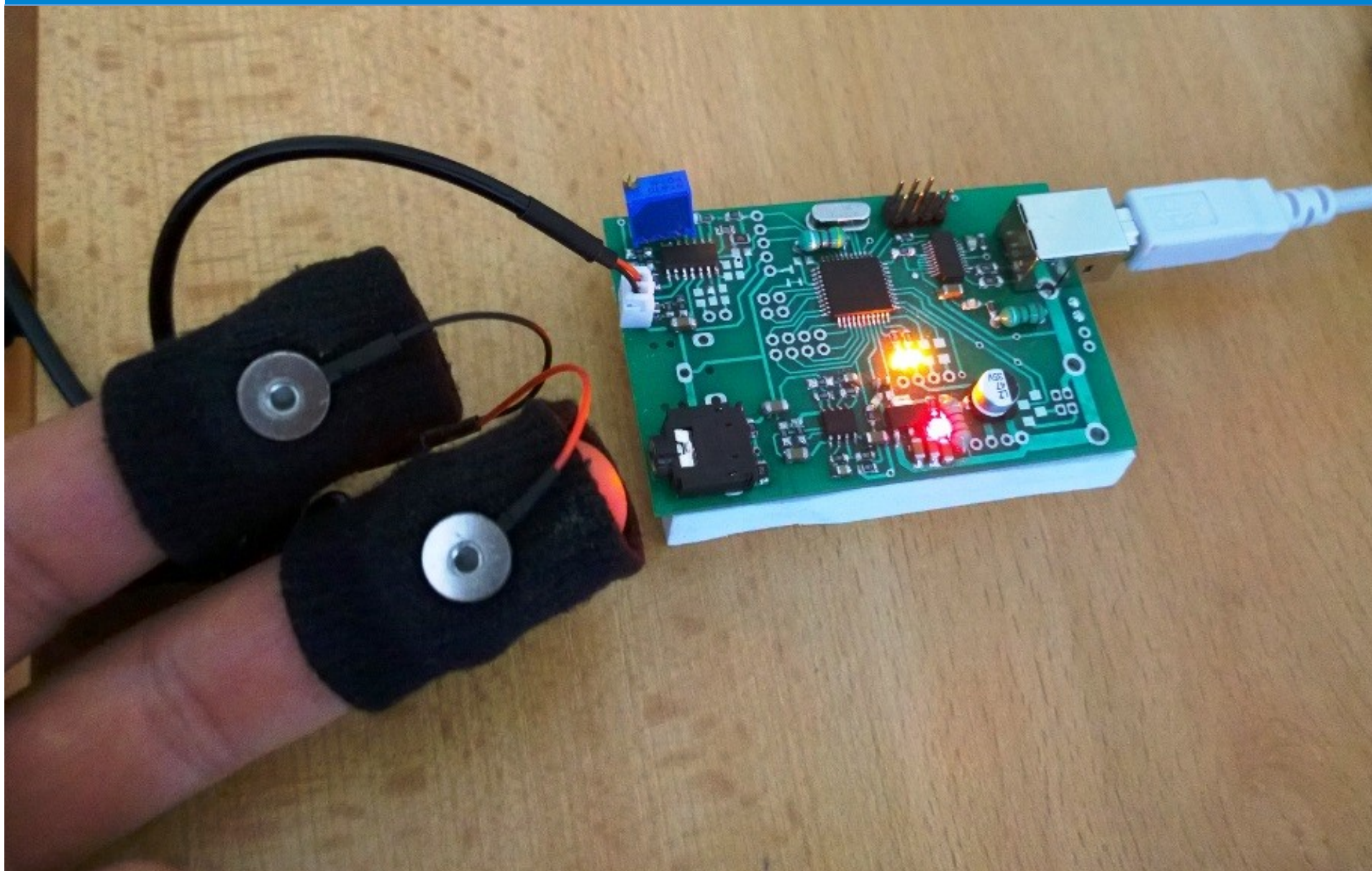


# Real-Time Arousal Detection Using Galvanic Skin Response Asset usage for game adaptation of the “Rush for Gold” game (in the scope of the ADAPTIMES project)

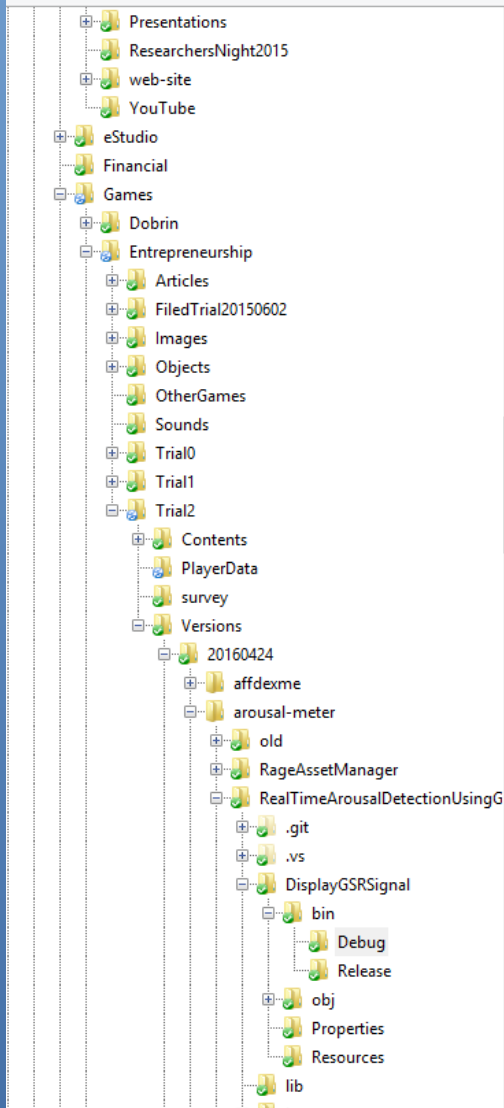


## Step 1: Starting the GSR measuring device



## Step 2: Starting the GSR asset

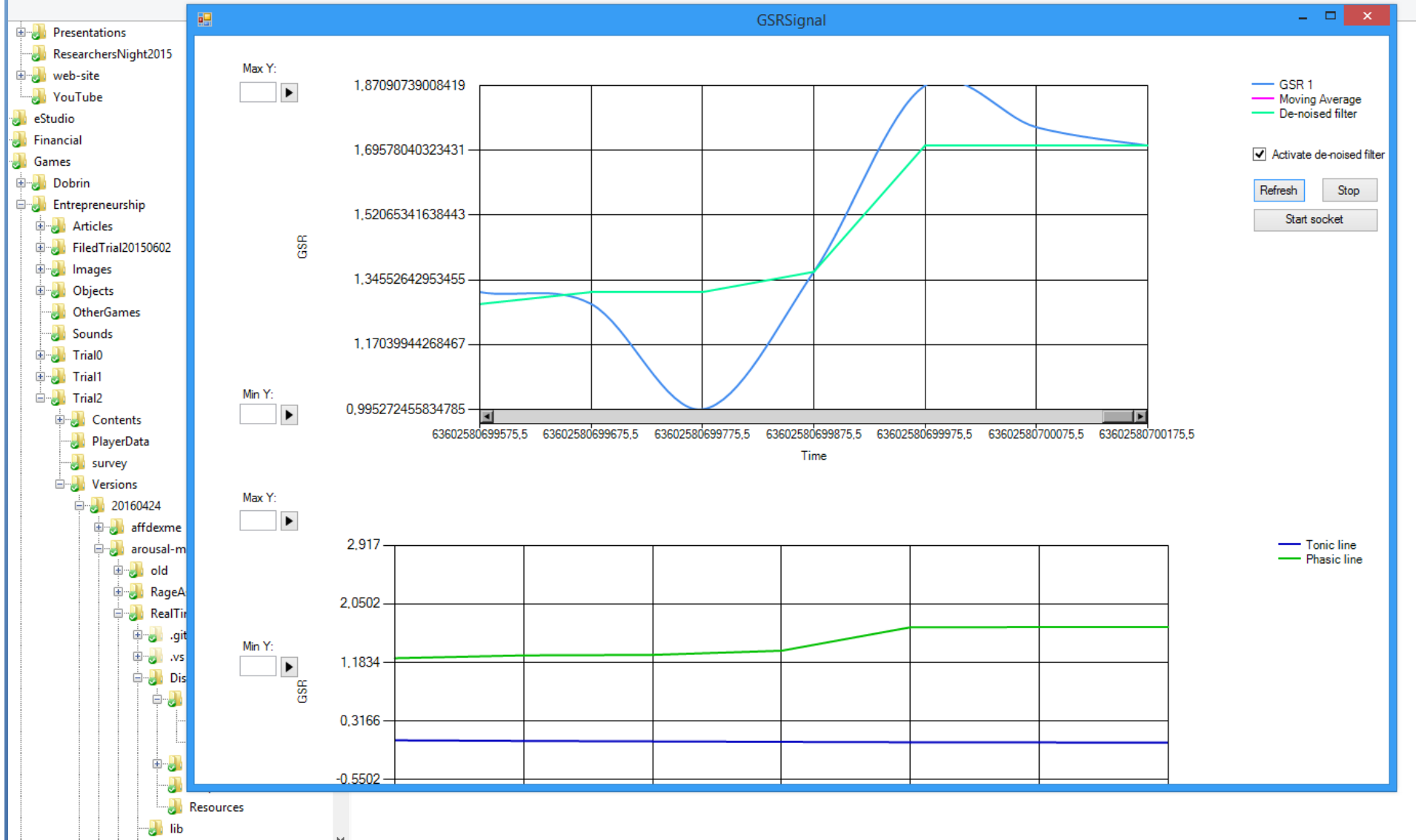
Este equipo > Windows8\_OS (C:) > Users > boyan > Dropbox > Projects > ADAPTIMITES > Games > Entrepreneurship > Trial2 > Versions > 20160424 > arousal-meter > RealTimeArousalDetectionUsingGSR



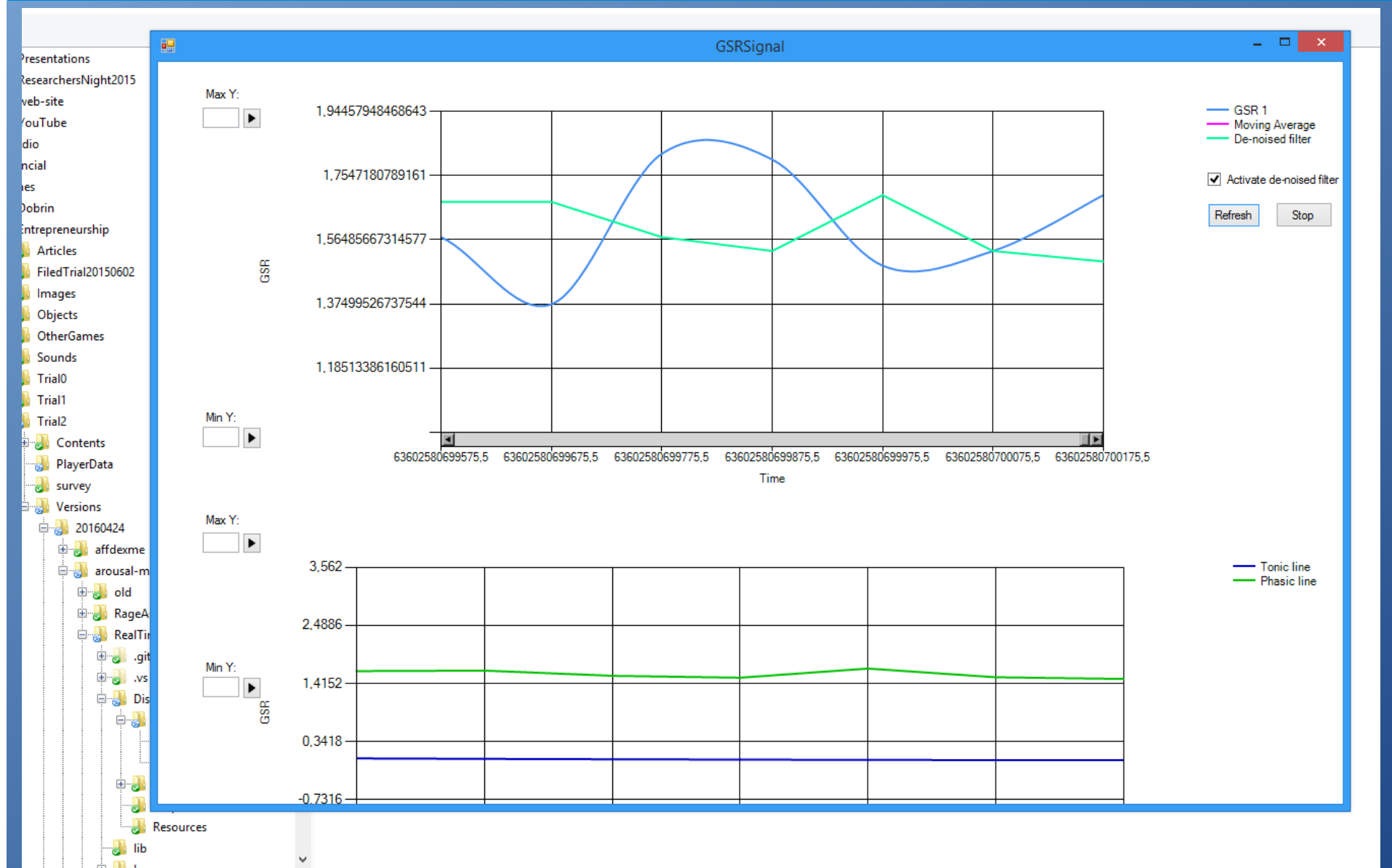
Nombre	Fecha de modifica...	Tipo	Tamaño
App.config	01/06/2016 9:23	Archivo CONFIG	4 KB
DisplayGSRSignal.exe	01/06/2016 18:55	Aplicación	55 KB
DisplayGSRSignal.exe.Config	26/06/2016 23:52	Archivo CONFIG	3 KB
DisplayGSRSignal.pdb	01/06/2016 18:55	Program Debug D...	56 KB
DisplayGSRSignal.vshost.exe	01/06/2016 19:01	Aplicación	24 KB
DisplayGSRSignal.vshost.exe.Config	01/06/2016 18:57	Archivo CONFIG	3 KB
DisplayGSRSignal.vshost.exe.manifest	18/06/2013 14:28	Archivo MANIFEST	1 KB
log.txt	17/02/2016 12:05	Documento de tex...	0 KB
Logger.dll	01/06/2016 14:01	Extensión de la apl...	6 KB
Logger.pdb	01/06/2016 14:01	Program Debug D...	16 KB
RageAssetManager.dll	01/06/2016 14:01	Extensión de la apl...	20 KB
RageAssetManager.pdb	01/06/2016 14:01	Program Debug D...	52 KB
RageAssetManager.xml	01/06/2016 14:01	Documento XML	34 KB
RealTimeArousalDetection.dll	01/06/2016 18:55	Extensión de la apl...	39 KB
RealTimeArousalDetection.pdb	01/06/2016 18:55	Program Debug D...	132 KB
SignalDevice.dll	01/06/2016 18:55	Extensión de la apl...	15 KB
SignalDevice.pdb	01/06/2016 18:55	Program Debug D...	50 KB
SocketServer.dll	01/06/2016 18:55	Extensión de la apl...	10 KB
SocketServer.pdb	01/06/2016 18:55	Program Debug D...	40 KB



## Step 3: Starting the GSR signal visualization



## Step 4: Starting the socket for asset integration



## Socket communication

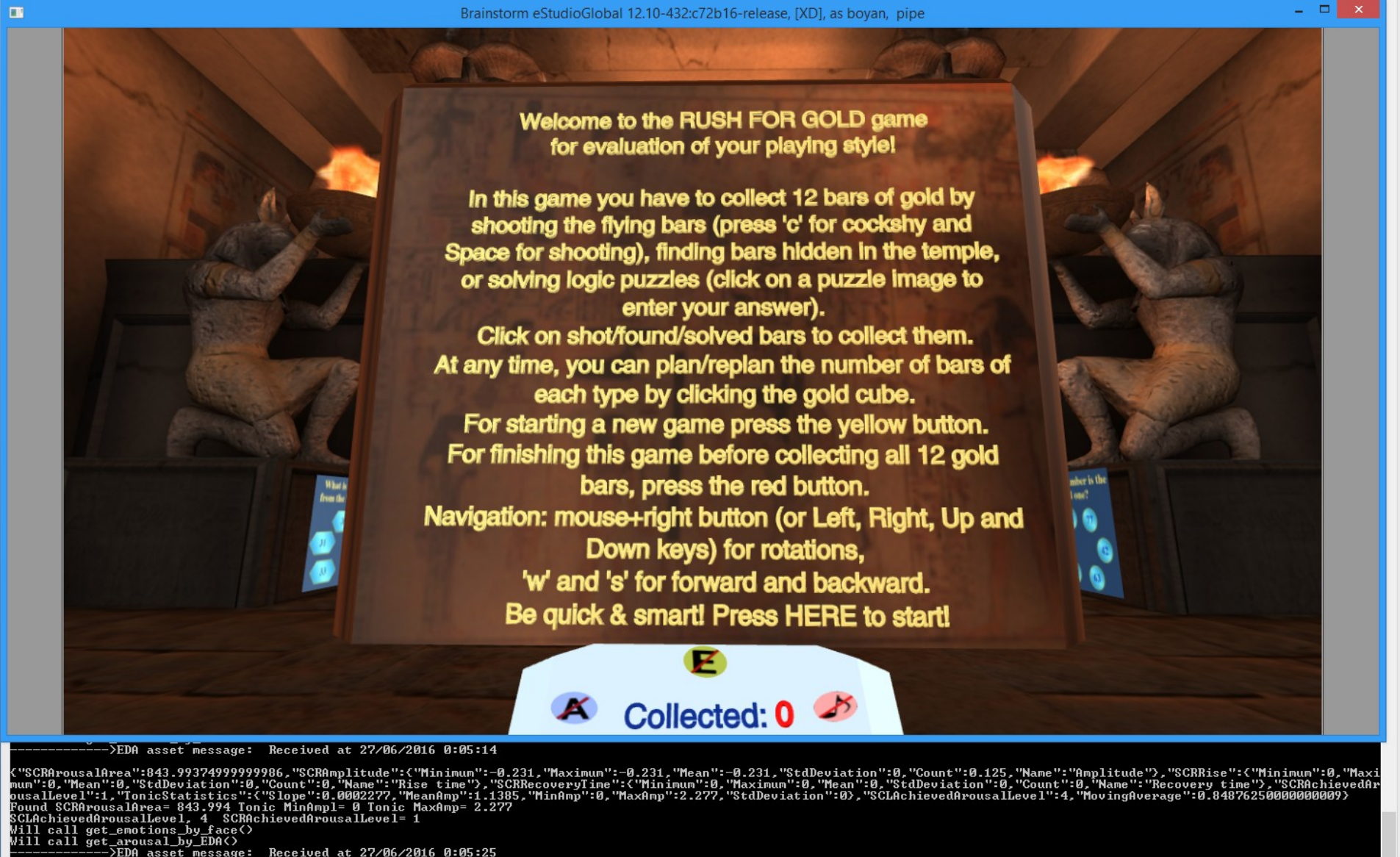
The measured and calculated from the asset emotional arousal status of the current gamer/user can be access by a socket client. For this purpose following messages are expected:

- ▶ EOCP - this is the message for end of calibration period. After this message the calibration settings (CalibrationMinArousalArea, CalibrationMaxArousalArea, CalibrationMinTonicAmplitude and CalibrationMaxTonicAmplitude) are calculated (for tha last time window) and saved.
- ▶ GET\_EDA - when the asset receives "GET\_EDA" it returns a json object with information for the emotional arousal level of the gamer/user (in the last time window);
- ▶ EOM - this is the command for end of measurement for the current gamer/user. After this message the statistical values for the SCR and SCL arousal (*MinAbsoluteArousalArea*, *MinAverageArousalArea*, *MaxAbsoluteArousalArea*, *MaxAverageArousalArea*, *MinAbsoluteTonicAmplitude*, *MinAverageTonicAmplitude*, *MaxAbsoluteTonicAmplitude*, *MaxAverageTonicAmplitude* and *NumberParticipants*) are updated.

# Example of a JSON object returned by the asset in socket communications

```
{
  "SCRArousalArea":770.88437500000009,
  "SCRAmplitude":{
    "Minimum":0.0010000000000001119,
    "Maximum":1.283,
    "Mean":0.428,
    "StdDeviation":0.604576435752062,
    "Count":0.375,
    "Name":"Amplitude"
  },
  "SCRRise":{
    "Minimum":50,
    "Maximum":5300,
    "Mean":1350,
    "StdDeviation":6.25,
    "Count":0.5,
    "Name":"Rise time"
  },
  "SCRRRecoveryTime":{
    "Minimum":25,
    "Maximum":25,
    "Mean":18.75,
    "StdDeviation":0,
    "Count":0.5,
    "Name":"Recovery time"
  },
  "SCRAchievedArousalLevel":2,
  "TonicStatistics":{
    "Slope":0,
    "MeanAmp":0,
    "MinAmp":0,
    "MaxAmp":2.266,
    "StdDeviation":1.133
  },
  "SCLAchievedArousalLevel":1,
  "MovingAverage: 0.76491874999999976
}
```

## Step 5: Starting the Rush for Gold action game





# Step 6: Playing the Rush for Gold game with lower SCR arousal



# Step 7: Playing the Rush for Gold game with higher SCR arousal

Brainstorm eStudioGlobal 12.10-432:c72b16-release, [XD], as boyan, pipe



```
400750000001}
Found SCRArousalArea= 32042.856 Tonic MinAmp= -44.179 Tonic MaxAmp= 46.783
SCLAchievedArousalLevel, 1 SCRAchievedArousalLevel= 7
Will call get_emotions_by_face<
Will call get_arousal_by_EDA<
----->EDA asset message: Received at 26/06/2016 23:45:04

{"SCRArousalArea":26103.407716796868,"SCRAmplitude":{"Minimum":0,"Maximum":0,"Mean":0,"StdDeviation":0,"Count":0,"Name":"Amplitude"},"SCRRise":{"Minimum":0,"Maximum":0,"Mean":0,"StdDeviation":0,"Count":0,"Name":"Rise time"},"SCRRecoveryTime":{"Minimum":0,"Maximum":0,"Mean":0,"StdDeviation":0,"Count":0,"Name":"Recovery time"},"SCRAchievedArousalLevel":6,"TonicStatistics":{"Slope":-0.00014895144976399192,"MeanAmp":-22.0895,"MinAmp":-44.179,"MaxAmp":46.783,"StdDeviation":37.3679210872404},"SCLAchievedArousalLevel":1,"MovingAverage":26.5418625}
Found SCRArousalArea= 26103.408 Tonic MinAmp= -44.179 Tonic MaxAmp= 46.783
SCLAchievedArousalLevel, 1 SCRAchievedArousalLevel= 6
```