

Anura™ Core SDK Developer Guide

This developer guide will help you effectively use the NuraLogix™ Anura™ Core SDK to build your own mobile applications for Affective AI. Here you will find step-by-step instructions to get you started and also more detailed references as you delve deeper.

The [Introduction](#) provides an architectural overview of the Core SDK and explains how it differs from DeepAffex™ Extraction SDK.

[Chapter 2](#) provides details about the contents of the Android and iOS core packages. Chapters [3](#) and [4](#) walk you through setup, configuration and basic usage of Anura™ Core SDK for Android and iOS respectively. [Chapter 5](#) talks about the sample applications that ships with the SDK.

[Chapter 6](#) explains the details of adapting third-party face trackers and alternate camera modules.

[Chapter 7](#) provides some details about the user profile questionnaire.

[Chapter 8](#) discusses how to interpret the results returned by the DeepAffex™ Cloud.

Finally, [Chapter 9](#) highlights some best practices.

Last updated on 2022-02-09 by Talal Haj Bakry (1.1.2)

Introduction

Before you begin, we recommend perusing the [DeepAffex™ Developer Guide](#) so that you have a basic understanding of NuraLogix™ DeepAffex™ technologies and terminologies. Please be sure to read the first two chapters - [Introduction](#) and [Getting Started](#).

Anura™ Core SDK

NuraLogix™ provides the DeepAffex™ Cloud for Affective AI. It is used to analyze facial blood-flow information that is extracted from image streams using the DeepAffex™ Extraction SDK.

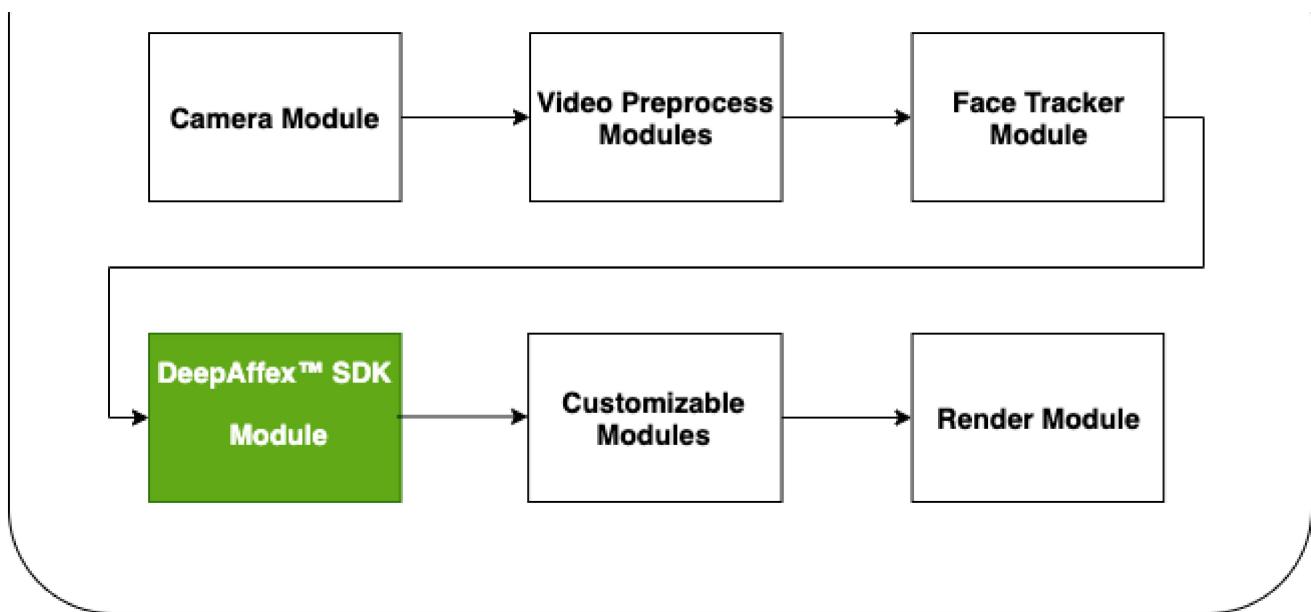
Anura™ Core SDK is a mobile software development kit designed to help developers quickly add NuraLogix™ Affective AI to in-house or commercial mobile applications. It contains the DeepAffex™ Extraction SDK and also provides all additional features required for doing DeepAffex™ analysis on mobile platforms - camera capture and preview, face tracker integration and a cloud module for interacting with the DeepAffex™ Cloud etc.

Anura™ Core SDK is available on both Android and iOS and is distributed privately via secure Git repositories to companies in partnership with NuraLogix™.

It is canonically documented inside the Android and iOS Git repositories respectively.

Components

The following diagram shows the major components of Anura™ Core SDK. The SDK facilitates the entire flow of extraction of facial blood-flow information based on face-tracked images and also renders the images used for extraction for the user.



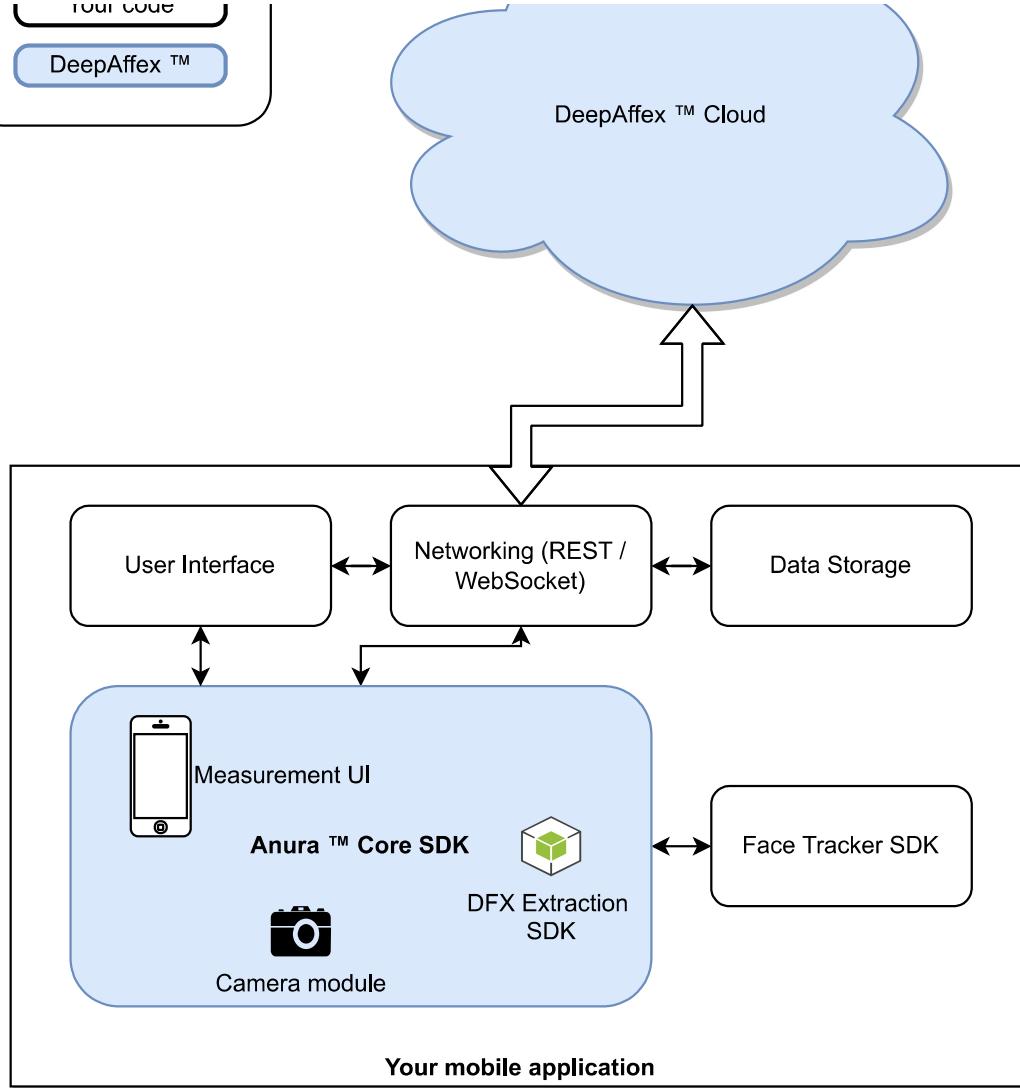
Architecture

The architecture of typical Anura™ Core SDK-based application is shown below:

Legend

Your code





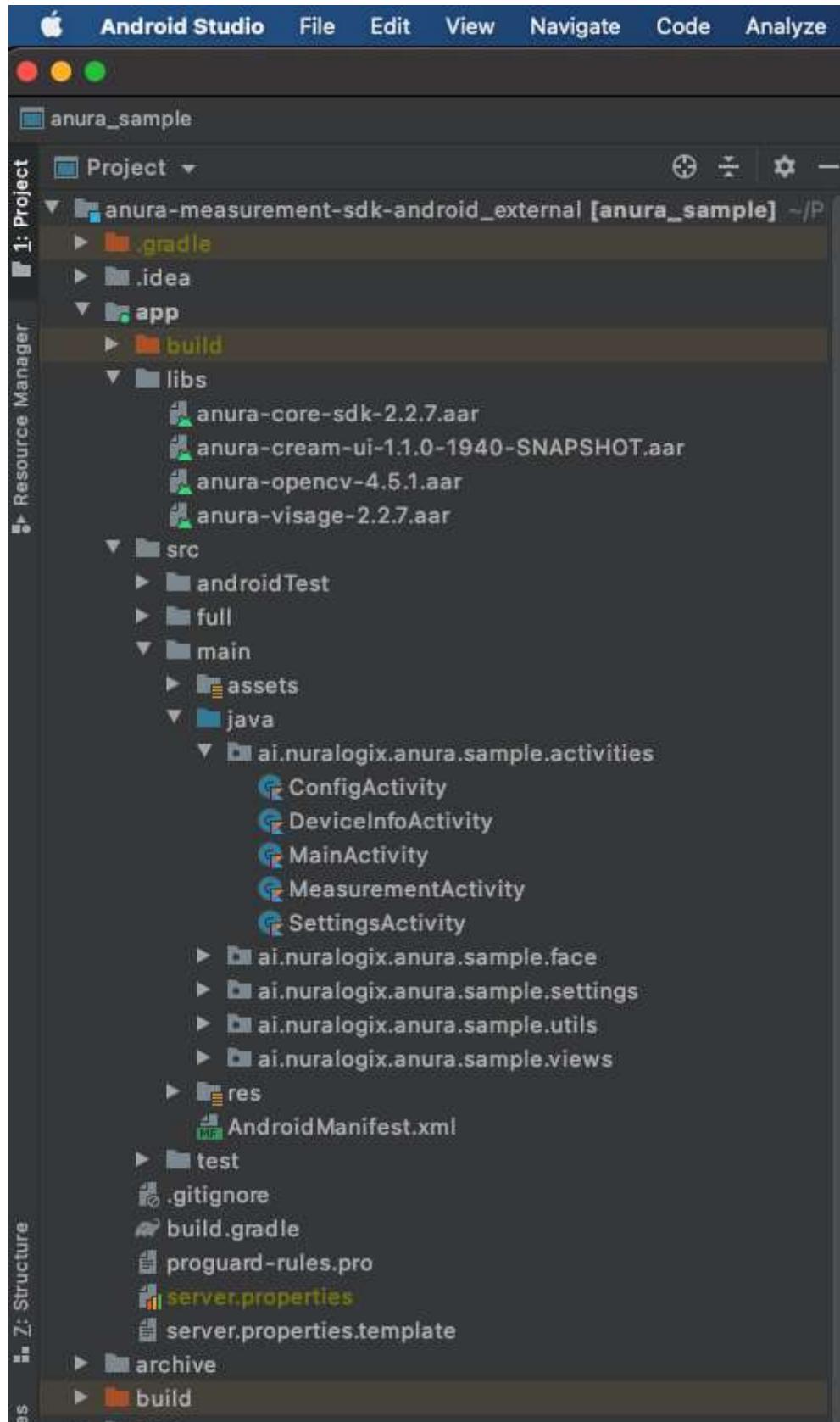
Localization

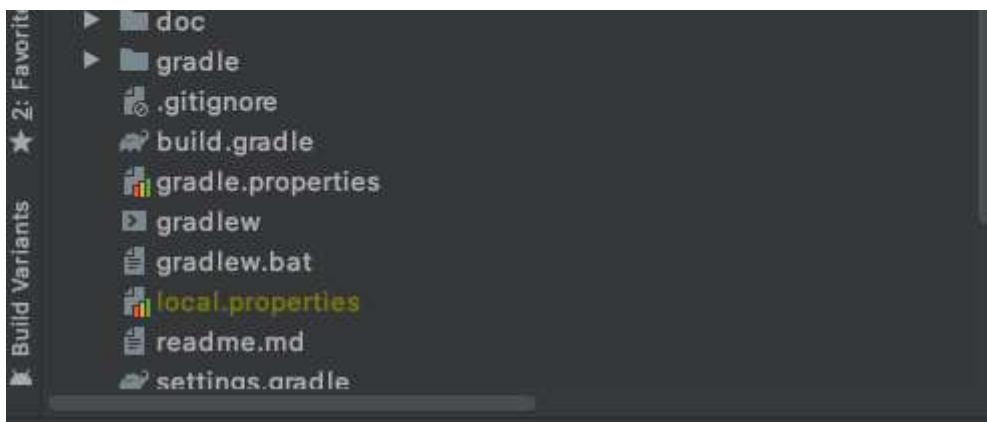
For demonstration purposes, the Anura™ Core SDK Sample App includes a subset of the UI prompts used by NuraLogix™ Anura™. You can change these prompts and add more according to the needs of your app and its users.

Anura™ Core SDK package manifest

Package contents of Anura™ Core SDK for Android

The Anura™ Core SDK for Android sample project looks like:





Binaries included

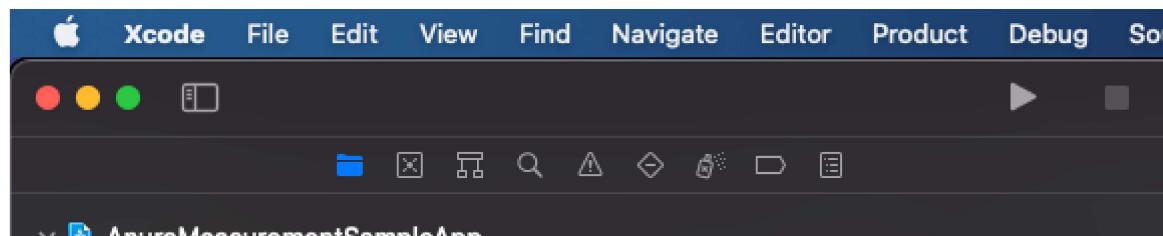
1. Anura Core SDK (~24 MB): includes arm64-v8a/armeabi-v7a/x86_64/x86 DFX SDK native libraries and Java jar package
2. OpenCV (~6 MB): a streamlined OpenCV package
3. Visage SDK (~13MB): Visage SDK native libraries and NuraLogix's wrapper to them

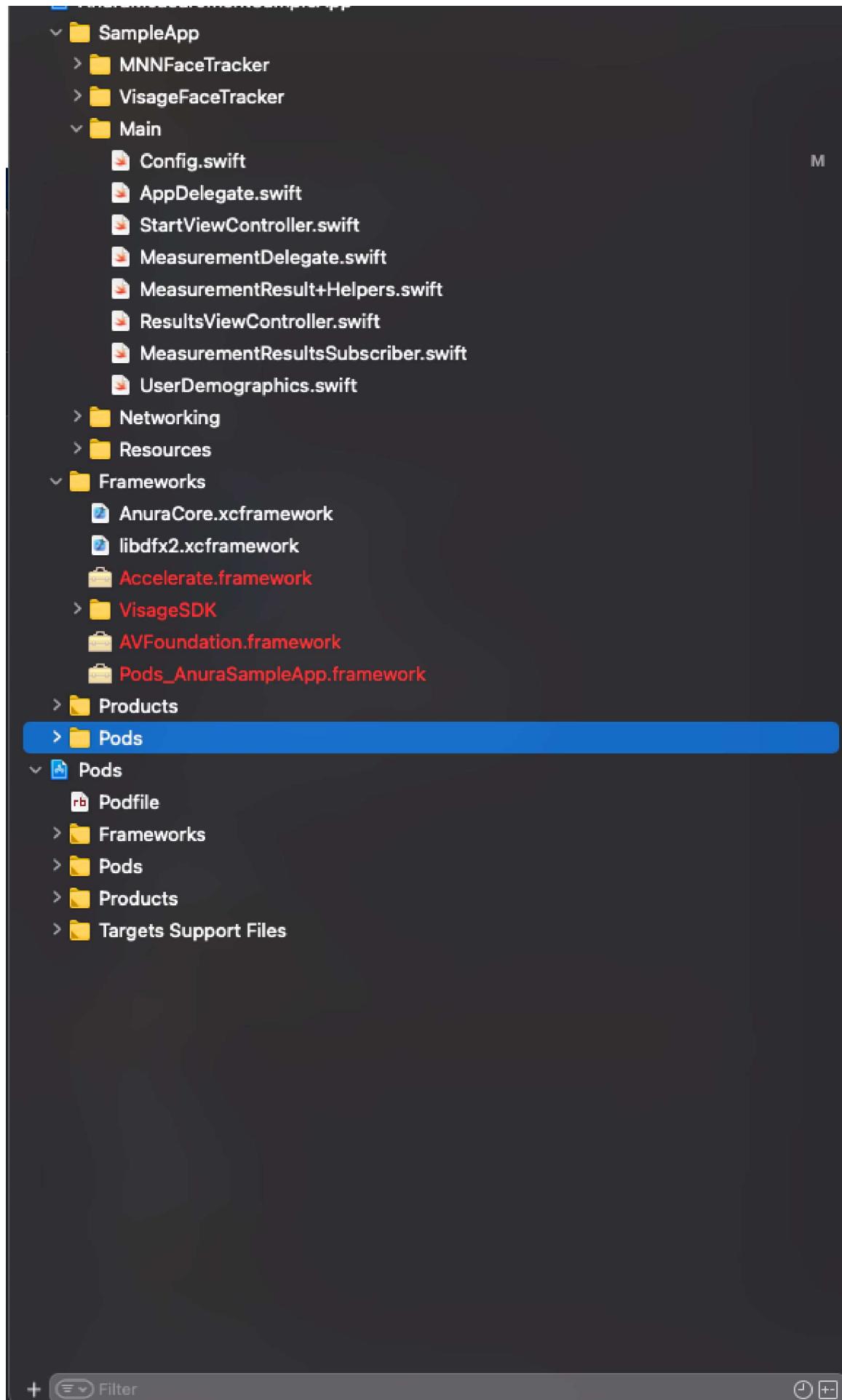
Source included

1. `ConfigActivity`: activity to dynamically enter server information, partner ID, license key and study ID.
2. `MainActivity`: sample app main page, that demonstrates communicating with DeepAffex™ Cloud to register the license and validate the device token
3. `MeasurementActivity`: Measurement UI that demonstrates how to use Anura™ Core APIs
4. `AnuraMeasurementActivity`: measurement UI similar to the NuraLogix™ Anura™ app

Package contents of Anura™ Core SDK for iOS

The Anura™ Core SDK for iOS sample project looks like:





Binaries included

1. Anura™ Core Framework (~5.5 MB): shared library for the Measurement UI that allows controlling the camera and rendering to the display
2. DFX Framework (~10.1 MB): shared library, that provides TOI extraction functionality
3. Visage SDK (~34 MB): Visage native libraries

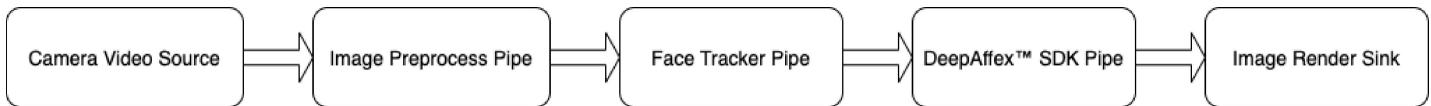
Source included

1. `Config`: to enter server information, license key and study ID.
2. `StartViewController`: sample app main page, that demonstrates communicating with DeepAffex™ Cloud to register the license and validate the device token
3. `UserDemographics`: to dynamically enter user demographics
4. `MeasurementDelegate`: to respond to various events from DeepAffex™ Cloud and AnuraCore to customize the app behaviour
5. `ResultsController`: a simple result list view
6. `VisageFaceTracker`: Visage face tracker adapter that demonstrates how to write custom face tracker adapter

Core SDK for Android

The Android version of the Core SDK can contain Source, Pipe and Sink modules: the SDK provides essential module interfaces for doing a measurement and also provides flexibility to developers to customize it and to add new modules in the video pipeline.

A typical video pipeline to start the measurement is shown below:



Requirements

The latest version of the Anura™ Core SDK for Android is 2.3.0. It requires Android 7.1 (API-level 25) or higher.

Setup

Please clone the Git repository for [Anura Core Android](#). It includes a simple sample app that demonstrates the use of the SDK's interfaces to create video pipeline to do a measurement.

Dependencies

Android Core SDK [AARs](#) are included in the `app/libs` folder. You can set up project dependencies in your `build.gradle` as shown below:

```
repositories {  
    flatDir {  
        dirs 'libs'  
    }  
}  
  
implementation(name: 'anura-core-sdk-2.2.2', ext: 'aar')  
implementation(name: 'opencv-4.1.2-15', ext: 'aar')
```

Using the Core SDK

Configuring Server Properties

Before you can get measurement results from the DeepAffex™ Cloud you will need to supply credentials and other information (provided by NuraLogix™).

Populate the `app/server.properties.template` file with this information:

```
SAMPLE_REST_URL="Test Server URL"
SAMPLE_WS_URL="Test WebSocket Server URL"
EMAIL="Your Email"
PASSWORD="Your Password"
LICENSE_KEY="Test License Key"
STUDY_ID="Test Study ID"
ORG_KEY="Test Organization Key"
```

You can then remove the `.template` suffix and you should be able to run sample app and complete a measurement.

Video Pipeline Management

The Video Pipeline has to be connected before a measurement is started and disconnected (and disposed) when the measurement is finished or when app exits (to release the underlining resources.) This is shown below:

```
override fun onCreate(savedInstanceState: Bundle?) {
```

```

    .....

    cameraSource.connect(preprocessPipe)
    preprocessPipe.connect(signalAnalysisPipe)
    signalAnalysisPipe.connect(faceTrackerPipe)
    faceTrackerPipe.connect(dfxPipe)
    dfxPipe.connect(renderingVideoSink)

    .....

}

override fun onDestroy() {

    .....

    renderingVideoSink.stop()
    cameraSource.disconnect(preprocessPipe)
    preprocessPipe.disconnect(signalAnalysisPipe)
    signalAnalysisPipe.disconnect(faceTrackerPipe)
    faceTrackerPipe.disconnect(dfxPipe)
    dfxPipe.disconnect(renderingVideoSink)

    cameraSource.close()
    preprocessPipe.close()
    faceTrackerPipe.close()
    dfxPipe.close()
    renderingVideoSink.close()

    .....

}

```

Cloud Analyzer Module

The Core SDK also provides a Cloud Analyzer module that simplifies connecting to the DeepAffex™ Cloud. It lets you create a [Measurement](#), subscribe to results and send extracted blood-flow payloads.

The code snippet below shows when starting to extract blood-flow, the cloud analyzer module also is started to send the payload to cloud

```

val dummy_demographics = mapOf(
    "gender:1" to "male",
    "age:1" to "20"
)

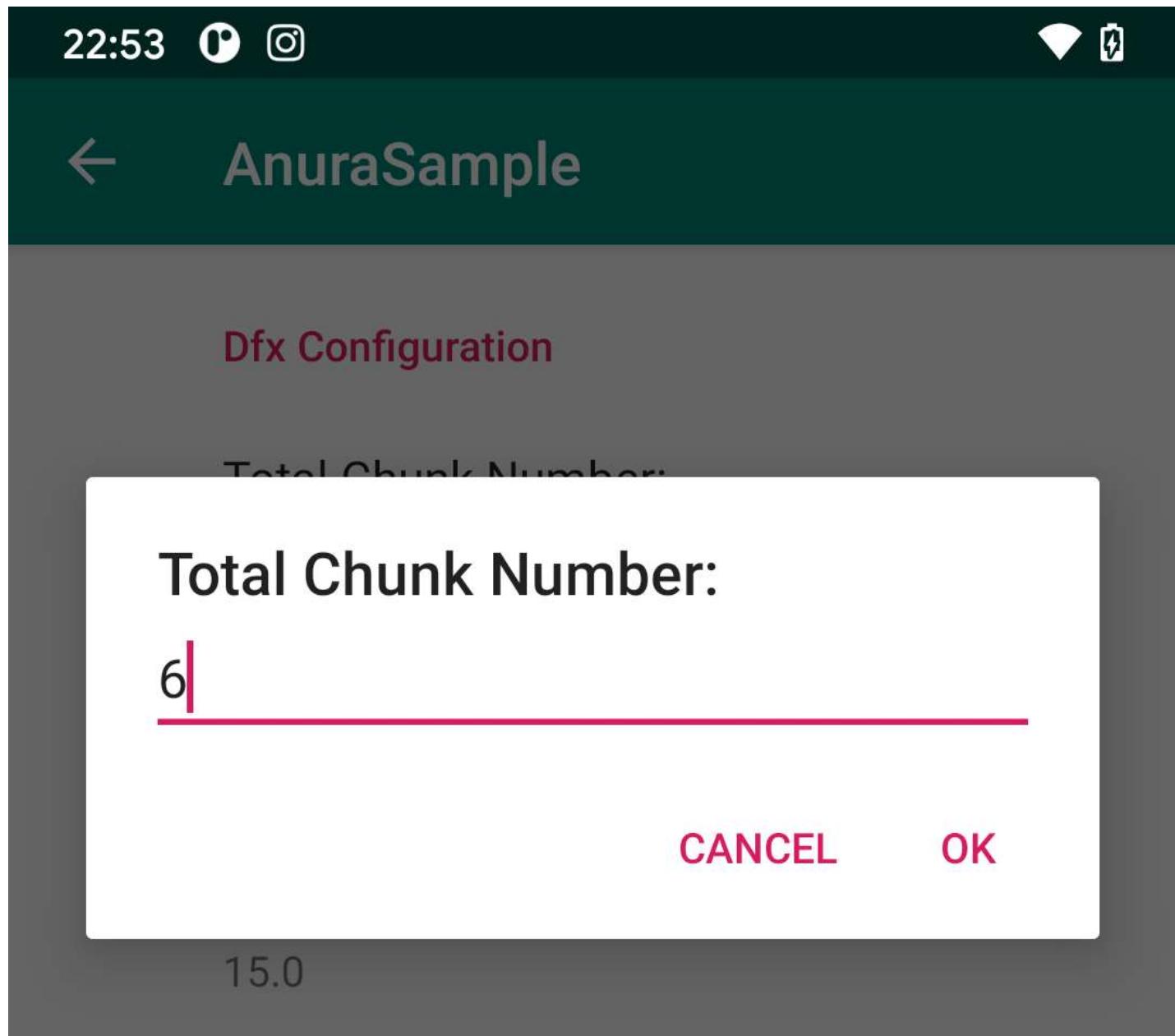
```

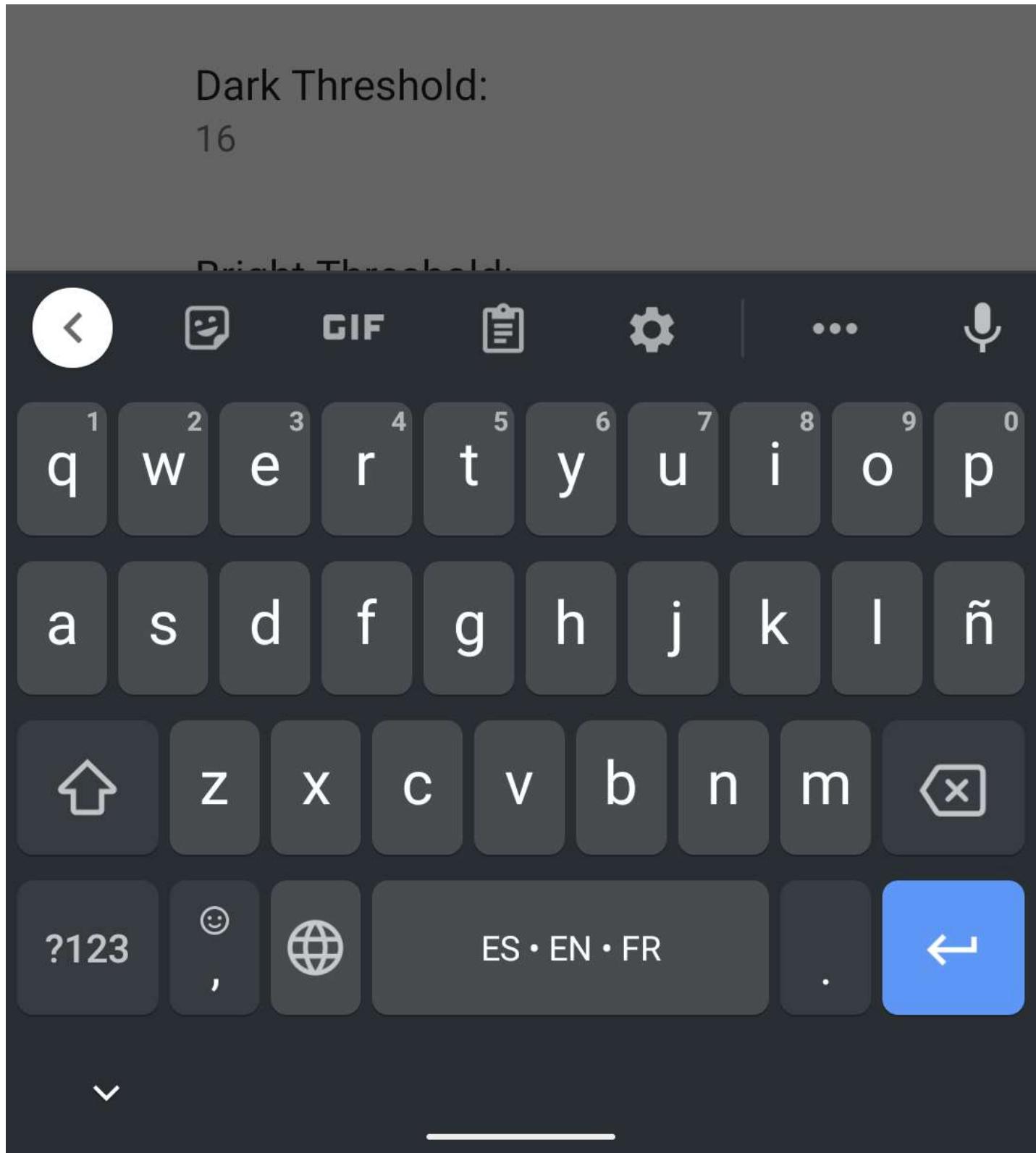
```
"age:1" to "20",
"height:1" to "175",
"weight:1" to "75",
"smoking:1" to "0",
"diabetes:1" to "0",
"antihypertensive:1" to "0",
"bloodpressuremedication:1" to "0")
dfxPipe.startCollect(dummy_demographics)
cloudAnalyzer.startAnalyzing(STUDY_ID, "")
```

Measurement UI Customization

Measurement UI similar to the Anura™ App is available in the Android sample application. If you need customizations, please modify this UI or write your own.

A screenshot is shown below:





Core SDK for iOS

The iOS version of the Core SDK wraps extraction flow shown above in [Android Video Pipeline](#) internally and provides simple interfaces, callbacks and some UI configurations to let you quickly get started.

Requirements

The latest version of the Anura Core SDK for iOS is 1.7.4. It requires Apple iOS 12.4 or higher.

Setup

Please clone the Git repository for [Anura Core iOS](#). It includes a minimal working example of mobile app that demonstrates the use of the SDK's features.

Dependencies

1. Run `pod install` under the root folder of the sample project. If you start your own project, please configure your `podfile` accordingly.
2. Core SDK for iOS frameworks are included in `./Frameworks`. They are already configured in sample project's target Build Settings. If you start your own project, please configure the frameworks in your project's target Build Settings.

Using the Core SDK

Configuring Server Properties

Before you can get measurement results from the DeepAffex™ Cloud you will need to supply credentials and other information (provided by NuraLogix™.) These include: license key, study ID, username, password, DeepAffex™ Cloud url etc. Please see `Config.swift` in the sample app as an example.

Sending extracted payloads to the DeepAffex™ Cloud

Each extracted payload is passed to the callback below. In the sample app project SampleApp/Networking a simple client implementation for the DeepAffex™ Cloud APIs is provided as reference. You may replace it with your own implementation.

```
@objc public protocol AnuraMeasurementDelegate: class {  
    ....  
    func anuraMeasurementControllerDidGetPayload(_ controller:  
        AnuraMeasurementViewController, _ payload: MeasurementPayload)  
    ....  
}
```

An example implementation that shows sending payload is shown below:

```
func anuraMeasurementControllerDidGetPayload(_ controller:  
    AnuraMeasurementViewController, _ payload: MeasurementPayload) {  
    ....  
}
```

```

print("+++++ anuraMeasurementControllerDidGetPayload: Chunk \
(payload.chunkOrder + 1) out of \(payload.numberOfChunks)")

// Determine measurement action from chunk order
let action : MeasurementDataRequest.Action
if payload.chunkOrder == 0 {
    action = .firstProcess
} else if payload.chunkOrder == payload.numberOfChunks - 1 {
    action = .lastProcess
} else {
    action = .chunkProcess
}

// Create Measurement Data Request
let measurementDataRequest = MeasurementDataRequest(chunkOrder:
Int(payload.chunkOrder),
action: action,
startTime: Int(payload.startTime),
endTime: Int(payload.endTime),
meta: String(data: payload.meta, encoding: .ascii) ?? ""),
payload: payload.payload)

// Send request to DeepAffex™ Cloud API, along with measurement ID
self.api.addData(measurementID: self.measurementID, data:
measurementDataRequest) { (result : NetworkResult<ID>) in
    switch result {
        case .success(let id):
            print("Added data to measurement (Chunk \((payload.chunkOrder + 1)) and
received MeasurementDataID: \((id.id))")
        case .failure(let error):
            print("Could not add data to measurement: \
(error.localizedDescription)")
    }
}
}

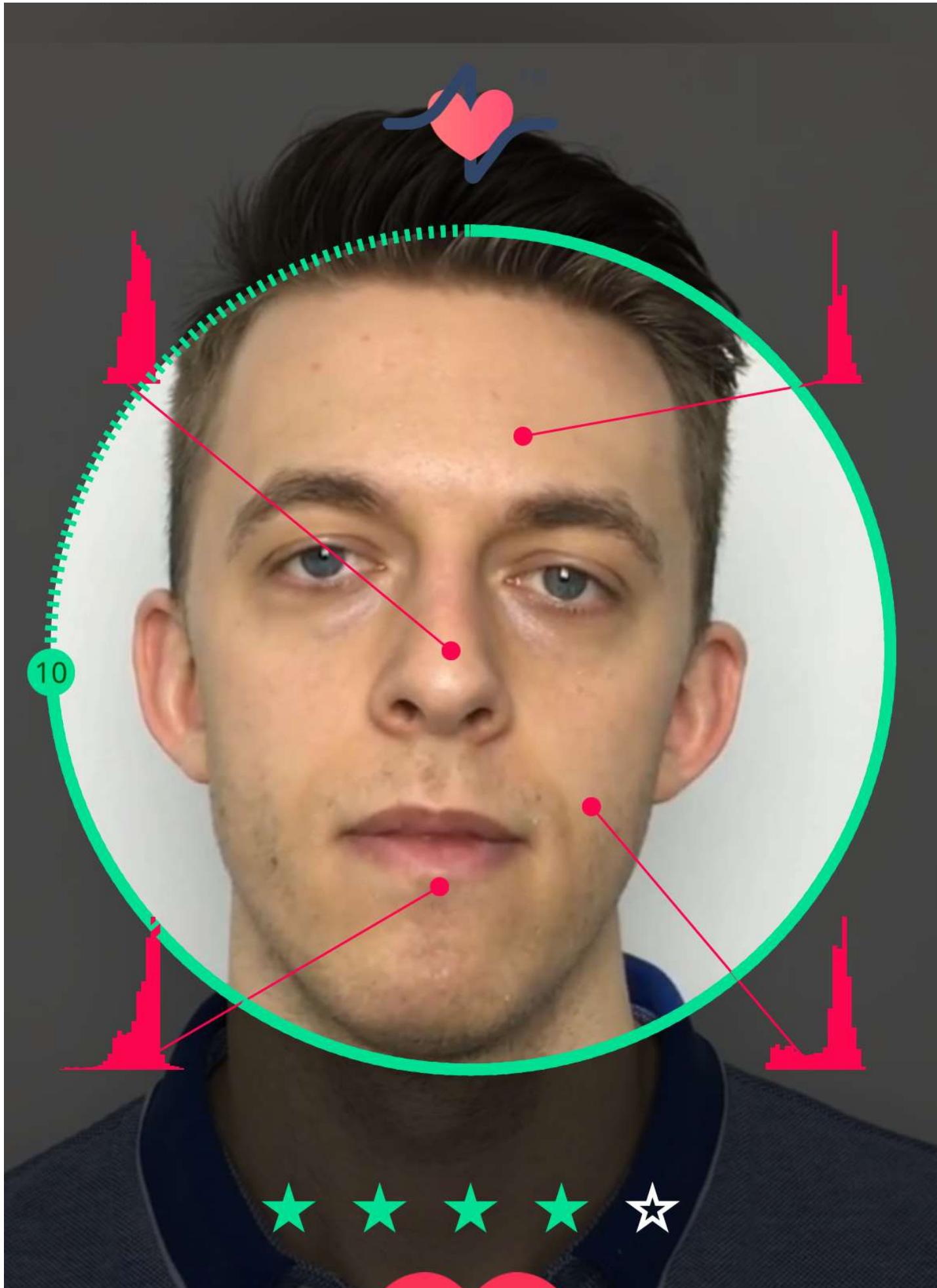
```

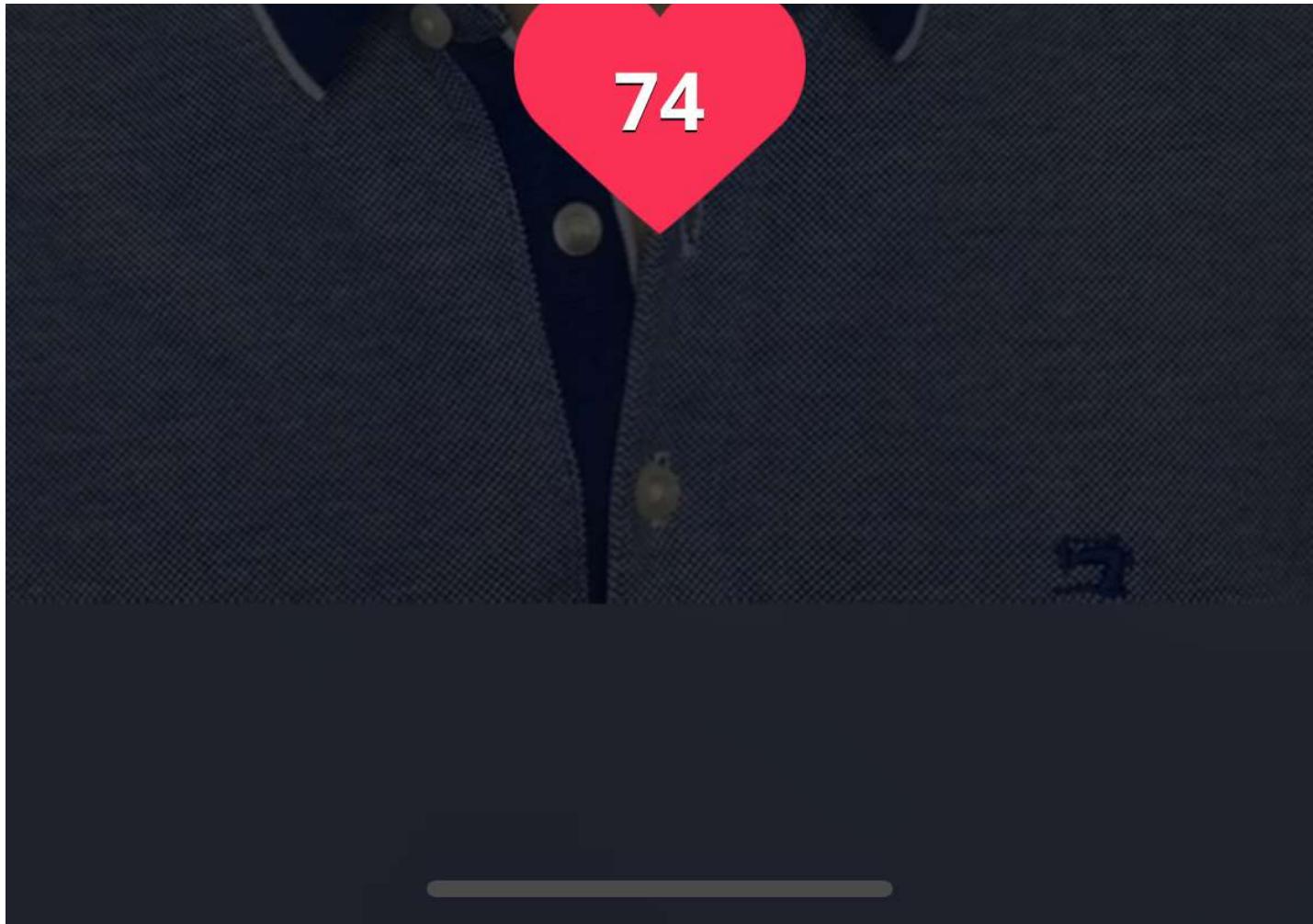
Measurement UI Customization

The exact measurement UI from the Anura™ App is available in `AnuraMeasurementViewController` (including stars, beating heart etc.) You can programmatically show or hide any element on the screen. If needed you can hide everything and just keep the camera view and write your own view on top of it.

A screenshot is shown below:







Sample Applications

The Anura™ Core Android and Anura™ Core iOS SDKs both ship with basic sample apps. These apps demonstrate how to use the SDK and can be used as a skeleton to build your own apps.

Anura™ Core Android Sample App

The sample application for Android showcases a basic integration of Anura™ Core in a native app written in Kotlin. The full source code of the sample application is included, and it demonstrates how to:

- Setup up app configurations including DeepAffex™ License, Study ID, Partner ID, Visage License, APP ID etc. in `server.properties`.
- Communicate with DeepAffex™ Cloud API:
 - Register your DeepAffex™ license
 - Validate API token
 - Get DeepAffex™ study config file
- Initialize the measurement pipeline in `MeasurementActivity`
- Pass user provided demographic information (age, sex at birth, height, and weight) as part of the measurement data.
- Utilize Visage Face Tracker by conforming to `FaceTrackerAdapter`
- Utilize `AnalyzerResult` to get results from DeepAffex™ to display

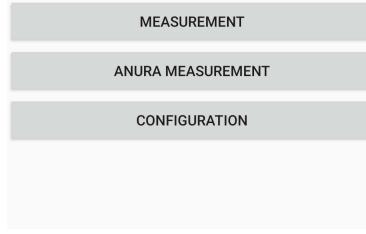
Note: Anura™ Core Android SDK does not include any UI components for displaying results. For more information on how to interpret the results, including colour codes and value ranges for each result, please refer to the [Interpreting Results](#) section of this guide.

Screenshots



Tips:

1. Click CONFIGURATION, Configure account information(Only need to do it once)
2. Click MEASUREMENT, start measurement
3. Do not move during the measurement and keep enough light



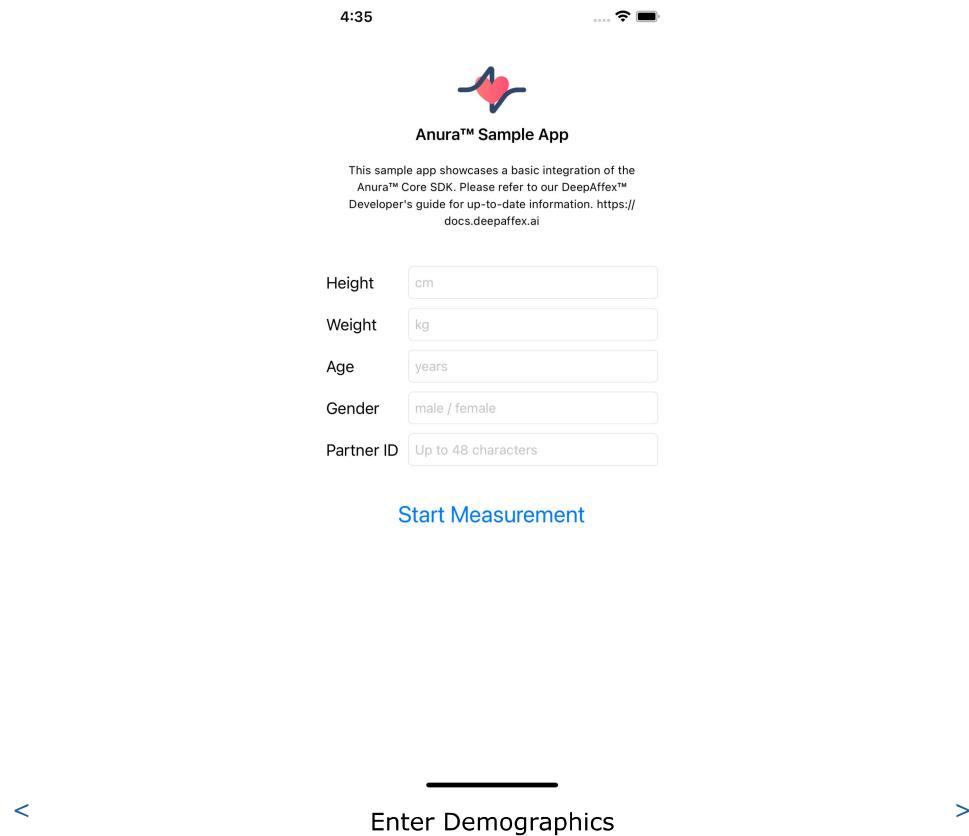
Anura™ Core iOS Sample App

The sample application for iOS showcases a basic integration of Anura™ Core in a native app written in Swift. The full source code of the sample application is included, and it demonstrates how to:

- Initialize and configure `AnuraMeasurementViewController`, the main `UIViewController` that displays the Anura™ measurement UI and controls the camera.
- Communicate with DeepAffex™ Cloud API:
 - Register your DeepAffex™ license.
 - Validate API token.
 - Create a measurement.
 - Send measurement data.
 - Receive measurement results through a WebSocket connection.
- Implement `AnuraMeasurementDelegate` methods, and how to handle various events from `AnuraMeasurementViewController` (e.g. face detected, measurement started/completed/cancelled, etc.)
- Pass user-provided demographic information (age, sex at birth, height, and weight) as part of the measurement data.
- Utilize Visage Face Tracker by conforming to `FaceTrackerProtocol`, and how to create an adapter for a different face tracker by starting from `staticFaceTracker`.
- Decode measurement results from DeepAffex™ Cloud API, with a basic display of the final results in a `UITableViewController`.

Note: Anura™ Core iOS SDK does not include any UI components for displaying results. For more information on how to interpret the results, including colour codes and value ranges for each result, please refer to the [Interpreting Results](#) section of this guide.

Screenshots



Adapting cameras and face trackers

Camera capture and face tracking are two important parts of the DeepAffex™ solution and there are numbers of third-party camera and face tracker components available in the market. To allow you to use them in your own app, Anura™ Core SDK provides adapter interfaces.

Camera Adapter

Core SDK for Android provides the `CameraAdapter` interface. You can implement it as shown below:

```
public class UserCamera implements CameraAdapter {  
    ... ...  
}  
  
public interface VideoSource extends Module {  
  
    /**  
     * Creates a camera source instance, which is used to capture video frames and  
     * pass them to the down streaming pipeline.  
     * @param name the name of this camera source  
     * @param core {@link Core} the core instance  
     * @param format {@link VideoFormat} the format of this video source  
     * @param cameraAdapter {@link CameraAdapter} the implementation of camera  
     * adapter  
     * @return a camera source instance  
    */  
    static VideoSource createCameraSource(  
        @NonNull String name,  
        @NonNull Core core,  
        @NonNull VideoFormat format,  
        @NonNull CameraAdapter cameraAdapter) {  
        return new CameraSourceImpl(name, core, format, cameraAdapter);  
    }  
  
    ... ...  
}
```

Face Tracker

Core SDK for Android and iOS both provide a face tracker interface:

Android provides `FaceTrackerAdapter`:

```
public class UserFaceTracker implements FaceTrackerAdapter {  
    ... ...  
}
```

```
}
```

```
public interface VideoPipe extends VideoSource {  
    /**  
     * Creates a face tracker pipe instance  
     *  
     * @param name      the name of this pipe  
     * @param core      {@link Core} the core instance  
     * @param format    {@link VideoFormat} the format of this video pipe  
     * @param faceTracker the implementation of {@link FaceTrackerAdapter}  
     */  
    static VideoPipe createFaceTrackerPipe(  
        @NonNull String name,  
        @NonNull Core core,  
        @NonNull VideoFormat format,  
        @NonNull FaceTrackerAdapter faceTracker,  
        @NonNull FaceTrackerPipeListener... listeners  
    ) {  
        return new FaceTrackerPipeImpl(name, core, format, faceTracker,  
listeners);  
    }  
  
    ... ...  
}
```

and iOS provides `FaceTrackerProtocol`:

```
@objc public protocol FaceTrackerProtocol {
```

```
@objc init(quality: FaceTrackerQuality)
```

```
@objc func trackFace(from videoFrame: VideoFrame) -> TrackedFace
```

```
@objc func lock()
```

```
@objc func unlock()
```

```
@objc func reset()
```

```
@objc var trackingBounds: CGRect { get set }
```

```
@objc var quality: FaceTrackerQuality { get set }
```

```
@objc var delegate: FaceTrackerDelegate? { get set }
```

```
}
```

```
@interface UserFaceTracker : FaceTrackerProtocol
```

```
... ...
```

```
@end
```

```
// Create Face Tracker
```

```
let faceTracker = UserFaceTracker(quality: .high)
```

```
// Create Anura Measurement View Controller
```

```
let viewController = AnuraMeasurementViewController(measurementConfiguration:  
measurementConfig, uiConfiguration: uiConfig, faceTracker: faceTracker)
```

Measurement Questionnaire

User Profile Questionnaire

The user profile questionnaire is used to get the most accurate results for blood pressure measurements.

Question	Key	Value
Age	"age"	13-120 (years)
Sex	"gender"	"male" / "female"
Height	"height"	120-220 (cm)
Weight	"weight"	30-300 (kg)

Medical History Questionnaire

The medical history questionnaire is used calculate cardiovascular disease risk likelihood with better accuracy.

Question	Key	Value
Do you smoke?	"smoking"	0 / 1
Are you taking blood pressure medication?	"bloodpressuremedication"	0 / 1
Are you diabetic?	"diabetes"	"0" / "type1" / "type2"

Note: The question "Do you have hypertension?" (`antihypertensive`) is deprecated and no longer required.

Interpreting Results

The DeepAffex Cloud API can process blood flow information and provide estimates for many different biological signals. You can use the following tables for further interpretation of these signals.

- [Heart Rate](#)
- [Mental Stress Index](#)
- [Breathing](#)
- [Systolic Blood Pressure](#)
- [Diastolic Blood Pressure](#)
- [Heart Rate Variability](#)
- [Irregular Heartbeats](#)
- [Cardiac Workload](#)
- [Vascular Capacity](#)
- [Body Mass Index](#)
- [Waist-to-Height Ratio](#)
- [Body Shape Index](#)
- [Facial Skin Age](#)
- [Cardiovascular Disease Risk](#)
- [Heart Attack Risk](#)
- [Stroke Risk](#)
- [Hypertension risk](#)
- [Type 2 Diabetes Risk](#)
- [Hypercholesterolemia risk](#)
- [Hypertriglyceridemia risk](#)
- [General Wellness Score](#)

Heart Rate

Signal ID: HR_BPM**Interpretation Table****Male / Female - Global**

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.0	20.0
1	1	20.0	24.4
1	2	24.4	28.9
1	3	28.9	33.3
1	4	33.3	37.8
1	5	37.8	42.2
1	6	42.2	46.6
1	7	46.6	51.1
1	8	51.1	55.5
1	9	55.5	60.0
2	0	60.0	61.3
2	1	61.3	62.7
2	2	62.7	64.0
2	3	64.0	65.3
2	4	65.3	66.7

2	5	66.7	68.0
2	6	68.0	69.3
2	7	69.3	70.7
2	8	70.7	72.0
2	9	72.0	73.3
2	10	73.3	74.7
2	11	74.7	76.0
2	12	76.0	77.3
2	13	77.3	78.7
2	14	78.7	80.0
2	15	80.0	81.3
2	16	81.3	82.7
2	17	82.7	84.0
2	18	84.0	85.3
2	19	85.3	86.7
2	20	86.7	88.0
2	21	88.0	89.3
2	22	89.3	90.7
2	23	90.7	92.0
2	24	92.0	93.3

2	25	93.3	94.7
2	26	94.7	96.0
2	27	96.0	97.3
2	28	97.3	98.7
2	29	98.7	100.0
3	0	100.0	104.0
3	1	104.0	108.0
3	2	108.0	112.0
3	3	112.0	116.0
3	4	116.0	120.0
3	5	120.0	124.0
3	6	124.0	128.0
3	7	128.0	132.0
3	8	132.0	136.0
3	9	136.0	140.0
3	10	140.0	$+\infty$

Mental Stress Index

Signal ID: MSI

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	1.0	1.1
1	1	1.1	1.2
1	2	1.2	1.3
1	3	1.3	1.4
1	4	1.4	1.5
1	5	1.5	1.6
1	6	1.6	1.7
1	7	1.7	1.8
1	8	1.8	1.9
1	9	1.9	2.0
2	0	2.0	2.1
2	1	2.1	2.2
2	2	2.2	2.3
2	3	2.3	2.4
2	4	2.4	2.5

2	5	2.5	2.6
2	6	2.6	2.7
2	7	2.7	2.8
2	8	2.8	2.9
2	9	2.9	3.0
3	0	3.0	3.1
3	1	3.1	3.2
3	2	3.2	3.3
3	3	3.3	3.4
3	4	3.4	3.5
3	5	3.5	3.6
3	6	3.6	3.7
3	7	3.7	3.8
3	8	3.8	3.9
3	9	3.9	4.0
4	0	4.0	4.1
4	1	4.1	4.2
4	2	4.2	4.3
4	3	4.3	4.4
4	4	4.4	4.5

4	5	4.5	4.6
4	6	4.6	4.7
4	7	4.7	4.8
4	8	4.8	4.9
4	9	4.9	5.0
5	0	5.0	5.1
5	1	5.1	5.2
5	2	5.2	5.3
5	3	5.3	5.4
5	4	5.4	5.5
5	5	5.5	5.6
5	6	5.6	5.7
5	7	5.7	5.8
5	8	5.8	5.9
5	9	5.9	5.9
5	10	5.9	+infinity

Breathing

Signal ID: BR_BPM

Definition

The normal resting breathing rate for adults is between 12 and 25 breaths per minute. A slower breathing rate may be caused by certain medications or suggest an underlying medical condition, for example, hypothyroidism, heart condition, electrolyte imbalance, etc. A faster breathing rate could have many causes including walking fast or exercise, asthma, anxiety, infection, or cardiovascular condition. You may want to consult your doctor if your breathing rate falls outside of the normal range.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.0	1.2
1	1	1.2	2.4
1	2	2.4	3.6
1	3	3.6	4.8
1	4	4.8	6.0
1	5	6.0	7.2
1	6	7.2	8.4
1	7	8.4	9.6
1	8	9.6	10.8

1	9	10.8	12.0
2	0	12.0	12.4
2	1	12.4	12.8
2	2	12.8	13.2
2	3	13.2	13.6
2	4	13.6	14.0
2	5	14.0	14.4
2	6	14.4	14.8
2	7	14.8	15.2
2	8	15.2	15.6
2	9	15.6	16.0
2	10	16.0	16.5
2	11	16.5	17.0
2	12	17.0	17.5
2	13	17.5	18.0
2	14	18.0	18.5
2	15	18.5	19.0
2	16	19.0	19.5
2	17	19.5	20.0
2	18	20.0	20.5
2	19	20.5	21.0

2	20	21.0	21.4
2	21	21.4	21.8
2	22	21.8	22.2
2	23	22.2	22.6
2	24	22.6	23.0
2	25	23.0	23.4
2	26	23.4	23.8
2	27	23.8	24.2
2	28	24.2	24.6
2	29	24.6	25.0
3	0	25.0	26.0
3	1	26.0	27.0
3	2	27.0	28.0
3	3	28.0	29.0
3	4	29.0	30.0
3	5	30.0	31.0
3	6	31.0	32.0
3	7	32.0	33.0
3	8	33.0	34.0
3	9	34.0	35.0
3	10	35.0	$+\infty$

Systolic Blood Pressure

Signal ID: BP_SYSTOLIC

Definition

Systolic blood pressure is the peak pressure in your brachial arteries during the contraction of your heart muscle, measured in millimetres of mercury (mmHg).

Systolic blood pressure levels in the USA:

According to the [American Heart Association](#) and the [American College of Cardiology](#), high blood pressure (hypertension) is defined as the following:

Systolic Blood Pressure (mmHg)	
Normal	< 120
Elevated	120 - 129
Hypertension	≥ 130

Systolic blood pressure levels elsewhere:

According to the [European Society of Cardiology](#) and the [European Society of Hypertension](#), high blood pressure (hypertension) is defined as the following:

Systolic Blood Pressure (mmHg)	
Optimal	< 120
Normal	120 - 129
High Normal	130 - 139
Hypertension	≥ 140

DISCLAIMER:

Anura™ is not a medical device and should not be used for medical purposes. Always consult with your physician or other medical professional should you have any health-related question, issues or emergency.

Accuracy of blood pressure estimates:

In a study published in the [American Heart Association journal – Circulation: Cardiovascular Imaging \(Vol. 12, No. 8\)](#) the proprietary technique used by Anura™ called Transdermal Optical Imaging (TOI) has been shown to measure blood pressure with an average overall accuracy of 95% over the following ranges:

- Systolic: 100 - 139 mmHg
- Diastolic: 60 – 89 mmHg

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0	45
1	1	45	50
1	2	50	55
1	3	55	60
1	4	60	65
1	5	65	70
1	6	70	75
1	7	75	80
1	8	80	85
1	9	85	90

2	0	90	93
2	1	93	96
2	2	96	99
2	3	99	102
2	4	102	105
2	5	105	108
2	6	108	111
2	7	111	114
2	8	114	117
2	9	117	120
3	0	120	121
3	1	121	122
3	2	122	123
3	3	123	124
3	4	124	125
3	5	125	126
3	6	126	127
3	7	127	128
3	8	128	129
3	9	129	130
4	0	130	131

4	1	131	132
4	2	132	133
4	3	133	134
4	4	134	135
4	5	135	136
4	6	136	137
4	7	137	138
4	8	138	139
4	9	139	140
5	0	140	144
5	1	144	148
5	2	148	152
5	3	152	156
5	4	156	160
5	5	160	164
5	6	164	168
5	7	168	172
5	8	172	176
5	9	176	180
5	10	180	+∞

Diastolic Blood Pressure

Signal ID: BP_DIASTOLIC

Definition

Diastolic blood pressure is the amount of pressure in your brachial arteries when your heart muscle is relaxed, measured in millimetres of mercury (mmHg).

Diastolic blood pressure levels in the USA:

According to the [American Heart Association](#) and the [American College of Cardiology](#), high blood pressure (hypertension) is defined as the following:

Diastolic Blood Pressure (mmHg)	
Normal	< 80
Hypertension	≥ 80

Diastolic blood pressure levels elsewhere:

According to the [European Society of Cardiology](#) and the [European Society of Hypertension](#), high blood pressure (hypertension) is defined as the following:

Diastolic Blood Pressure (mmHg)	
Optimal	< 80
Normal	80 - 84
High Normal	85 - 89
Hypertension	≥ 90

DISCLAIMER:

Anura™ is not a medical device and should not be used for medical purposes. Always consult with your physician or other medical professional should you have any health-related question, issues or emergency.

Accuracy of blood pressure estimates:

In a study published in the [American Heart Association Journal – Circulation: Cardiovascular Imaging \(Vol. 12, No. 8\)](#) the proprietary technique used by Anura™ called Transdermal Optical Imaging (TOI) has been shown to measure blood pressure with an average overall accuracy of 95% over the following ranges:

- Systolic: 100 - 139 mmHg
- Diastolic: 60 – 89 mmHg

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0	30
1	1	30	33
1	2	33	37
1	3	37	40
1	4	40	43
1	5	43	47
1	6	47	50
1	7	50	53
1	8	53	57
1	9	57	60
2	0	60	61
2	1	61	62

2	2	62	63
2	3	63	64
2	4	64	65
2	5	65	66
2	6	66	67
2	7	67	68
2	8	68	69
2	9	69	70
3	0	70	71
3	1	71	72
3	2	72	73
3	3	73	74
3	4	74	75
3	5	75	76
3	6	76	77
3	7	77	78
3	8	78	79
3	9	79	80
4	0	80	81
4	1	81	82

4	2	82	83
4	3	83	84
4	4	84	85
4	5	85	86
4	6	86	87
4	7	87	88
4	8	88	89
4	9	89	90
5	0	90	93
5	1	93	96
5	2	96	99
5	3	99	102
5	4	102	105
5	5	105	108
5	6	108	111
5	7	111	114
5	8	114	117
5	9	117	120
5	10	120	+∞

Heart Rate Variability

Signal ID: HRV_SDNN

Definition

Heart Rate Variability refers to the variability in the timing between one heartbeat and the next. Anura™ measures this with SDNN, which is the standard deviation of the interval between normal heartbeats (in milliseconds). A higher SDNN corresponds to more inter-beat variability.

Increased heart rate variability suggests an increase in parasympathetic activity and/or a decrease in sympathetic activity of the autonomic nervous system.

High resting heart rate variability is considered healthy and means that the heart is more flexible to the changing needs of the body.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.0	1.1
1	1	1.1	2.2
1	2	2.2	3.2
1	3	3.2	4.3
1	4	4.3	5.4
1	5	5.4	6.5
1	6	6.5	7.6
1	7	7.6	8.6

1	8	8.6	9.7
1	9	9.7	10.8
2	0	10.8	11.4
2	1	11.4	11.9
2	2	11.9	12.5
2	3	12.5	13.0
2	4	13.0	13.6
2	5	13.6	14.2
2	6	14.2	14.7
2	7	14.7	15.3
2	8	15.3	15.8
2	9	15.8	16.4
3	0	16.4	18.3
3	1	18.3	20.2
3	2	20.2	22.1
3	3	22.1	24.0
3	4	24.0	26.0
3	5	26.0	27.9
3	6	27.9	29.8
3	7	29.8	31.7
3	8	31.7	33.6

3	9	33.6	35.5
4	0	35.5	37.1
4	1	37.1	38.7
4	2	38.7	40.3
4	3	40.3	41.9
4	4	41.9	43.5
4	5	43.5	45.1
4	6	45.1	46.7
4	7	46.7	48.3
4	8	48.3	49.9
4	9	49.9	51.5
5	0	51.5	54.4
5	1	54.4	57.2
5	2	57.2	60.1
5	3	60.1	62.9
5	4	62.9	65.8
5	5	65.8	68.6
5	6	68.6	71.5
5	7	71.5	74.3
5	8	74.3	77.2
5	9	77.2	80.0

5	10	80.0	inf
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Irregular Heartbeats

Signal ID: IHB_COUNT

Definition

The number displayed is the number of irregular heartbeats Anura™ detected in 30 seconds.

An irregular heartbeat is one that occurs outside of your heart's normal rhythm. The beat may have occurred sooner than expected or your heart may have seemed to 'skip' a beat. Sometimes it can feel like a thump in your chest, or the feeling that your heart is beating quickly or fluttering.

Irregular heartbeats are usually harmless. Most often they are triggered by things that increase adrenaline in the body like anxiety, caffeine, and nicotine.

In rare cases, they could indicate a more serious condition like an electrolyte imbalance or a heart condition. You should consult your doctor if you have a persistent irregular heartbeat. You should seek immediate medical attention if the onset of irregular heartbeats is combined with other symptoms of a heart problem like dizziness, chest pain, or shortness of breath.

Cardiac Workload

Signal ID: BP_RPP

Definition

Cardiac Workload, or more precisely myocardial workload, is a measure of the stress put on the heart muscle.

Cardiac Workload can be calculated using the formula: Heart Rate x Systolic Blood Pressure.

When measured at rest, this index can be used as an indicator of cardiovascular health.

For example, a person who exercises regularly may have lower Cardiac Workload than another person who has a sedentary lifestyle. During intense physical exercise, your Cardiac Workload may increase but should decrease post-exercise.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00	3.71
1	1	3.71	3.72
1	2	3.72	3.73
1	3	3.73	3.74
1	4	3.74	3.75
1	5	3.75	3.76
1	6	3.76	3.77
1	7	3.77	3.78

1	8	3.78	3.79
1	9	3.79	3.80
2	0	3.80	3.81
2	1	3.81	3.82
2	2	3.82	3.83
2	3	3.83	3.84
2	4	3.84	3.85
2	5	3.85	3.86
2	6	3.86	3.87
2	7	3.87	3.88
2	8	3.88	3.89
2	9	3.89	3.90
3	0	3.90	3.91
3	1	3.91	3.93
3	2	3.93	3.95
3	3	3.95	3.97
3	4	3.97	3.99
3	5	3.99	4.01
3	6	4.01	4.03
3	7	4.03	4.05

3	8	4.05	4.06
3	9	4.06	4.08
4	0	4.08	4.09
4	1	4.09	4.10
4	2	4.10	4.11
4	3	4.11	4.12
4	4	4.12	4.13
4	5	4.13	4.14
4	6	4.14	4.15
4	7	4.15	4.16
4	8	4.16	4.17
4	9	4.17	4.18
5	0	4.18	4.19
5	1	4.19	4.20
5	2	4.20	4.21
5	3	4.21	4.22
5	4	4.22	4.23
5	5	4.23	4.24
5	6	4.24	4.25
5	7	4.25	4.26
5	8	4.26	4.27

5	9	4.27	4.28
5	10	4.28	$+\infty$

Vascular Capacity

Signal ID: BP_TAU

Definition

Vascular Capacity, or Tau, is a measure of the elasticity of your blood vessels.

Vascular Capacity can be calculated using the formula: R (Vascular Resistance) $\times C$ (Arterial Compliance).

When measured at rest, this index can be used as an indicator of cardiovascular health as it is strongly correlated with vascular stiffness.

A person with a high Tau has better vascular health than a person with a low Tau. Also, certain transient activities and physiological events can lead to immediate changes in Tau (e.g., drinking alcohol, smoking).

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00	0.30
1	1	0.30	0.35
1	2	0.35	0.41
1	3	0.41	0.46
1	4	0.46	0.52
1	5	0.52	0.57
1	6	0.57	0.62

1	7	0.62	0.68
1	8	0.68	0.73
1	9	0.73	0.79
2	0	0.79	0.82
2	1	0.82	0.86
2	2	0.86	0.89
2	3	0.89	0.92
2	4	0.92	0.96
2	5	0.96	0.99
2	6	0.99	1.02
2	7	1.02	1.05
2	8	1.05	1.09
2	9	1.09	1.12
3	0	1.12	1.19
3	1	1.19	1.25
3	2	1.25	1.32
3	3	1.32	1.38
3	4	1.38	1.45
3	5	1.45	1.52
3	6	1.52	1.58
3	7	1.58	1.65

3	8	1.65	1.71
3	9	1.71	1.78
4	0	1.78	1.81
4	1	1.81	1.85
4	2	1.85	1.88
4	3	1.88	1.91
4	4	1.91	1.95
4	5	1.95	1.98
4	6	1.98	2.01
4	7	2.01	2.04
4	8	2.04	2.08
4	9	2.08	2.11
5	0	2.11	2.20
5	1	2.20	2.29
5	2	2.29	2.38
5	3	2.38	2.47
5	4	2.47	2.56
5	5	2.56	2.64
5	6	2.64	2.73
5	7	2.73	2.82
5	8	2.82	2.91

5	9	2.91	3.00
5	10	3.00	$+\infty$

Body Mass Index

Signal ID (Predicted): BMI

Signal ID (Calculated): BMI_CALC

Definition

Body Mass Index (BMI) is a measure of an individual's tissue mass (muscle, fat, and bone) adjusted for height. It is a commonly used indicator of overall body fat and serves as a tool for categorizing individuals as being underweight, normal weight, overweight, or obese on the basis of health risk.

Body Mass Index is a fair predictor of cardiovascular diseases, type 2 diabetes, gallstones, and certain cancers. It is one of the best anthropometric predictors of high-density lipoprotein (HDL) and triglyceride levels; these are important factors for cardio-metabolic diseases. It is also one of the best anthropometric predictors of uric acid levels (high uric acid levels contribute to gallstones). A limitation of Body Mass Index is that it cannot distinguish between fat and muscle mass and thus can be inaccurate in muscular individuals.

You can calculate your Body Mass Index using the formula: $BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$

According to the **World Health Organization**:

BMI	Weight Status
Below 18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Pre-obesity
30.0-34.9	Obesity Class I
35.0-39.9	Obesity Class II
40 or above	Obesity Class III

For more information, see: Zhou, W., Wang, Y., Gu, X., Feng, Z. P., Lee, K., Peng, Y., & Barszczyk, A. (2020) Importance of general adiposity, visceral adiposity and vital signs in predicting blood biomarkers using machine learning. *International Journal of Clinical Practice*, e13664.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.0	10.0
1	1	10.0	10.9
1	2	10.9	11.9
1	3	11.9	12.8
1	4	12.8	13.8
1	5	13.8	14.7
1	6	14.7	15.7
1	7	15.7	16.6
1	8	16.6	17.6
1	9	17.6	18.5
2	0	18.5	19.2
2	1	19.2	19.8
2	2	19.8	20.5
2	3	20.5	21.1
2	4	21.1	21.8
2	5	21.8	22.4
2	6	22.4	23.1
2	7	23.1	23.7

2	8	23.7	24.4
2	9	24.4	25.0
3	0	25.0	25.5
3	1	25.5	26.0
3	2	26.0	26.5
3	3	26.5	27.0
3	4	27.0	27.5
3	5	27.5	28.0
3	6	28.0	28.5
3	7	28.5	29.0
3	8	29.0	29.5
3	9	29.5	30.0
4	0	30.0	30.5
4	1	30.5	31.0
4	2	31.0	31.5
4	3	31.5	32.0
4	4	32.0	32.5
4	5	32.5	33.0
4	6	33.0	33.5
4	7	33.5	34.0
4	8	34.0	34.5

4	9	34.5	35.0
5	0	35.0	37.5
5	1	37.5	40.0
5	2	40.0	42.5
5	3	42.5	45.0
5	4	45.0	47.5
5	5	47.5	50.0
5	6	50.0	52.5
5	7	52.5	55.0
5	8	55.0	57.5
5	9	57.5	60.0
5	10	60.0	+∞

Male - East Asia

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.0	10.0
1	1	10.0	10.9
1	2	10.9	11.9
1	3	11.9	12.8
1	4	12.8	13.8

1	5	13.8	14.7
1	6	14.7	15.7
1	7	15.7	16.6
1	8	16.6	17.6
1	9	17.6	18.5
2	0	18.5	19.1
2	1	19.1	19.6
2	2	19.6	20.2
2	3	20.2	20.7
2	4	20.7	21.3
2	5	21.3	21.8
2	6	21.8	22.4
2	7	22.4	22.9
2	8	22.9	23.5
2	9	23.5	24.0
3	0	24.0	24.4
3	1	24.4	24.8
3	2	24.8	25.2
3	3	25.2	25.6
3	4	25.6	26.0
3	5	26.0	26.4

3	6	26.4	26.8
3	7	26.8	27.2
3	8	27.2	27.6
3	9	27.6	28.0
4	0	28.0	28.7
4	1	28.7	29.4
4	2	29.4	30.1
4	3	30.1	30.8
4	4	30.8	31.5
4	5	31.5	32.2
4	6	32.2	32.9
4	7	32.9	33.6
4	8	33.6	34.3
4	9	34.3	35.0
4	10	35.0	+∞

Female - East Asia

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.0	10.0
1	1	10.0	10.9
1	2	10.9	11.9

1	3	11.9	12.8
1	4	12.8	13.8
1	5	13.8	14.7
1	6	14.7	15.7
1	7	15.7	16.6
1	8	16.6	17.6
1	9	17.6	18.5
2	0	18.5	19.1
2	1	19.1	19.6
2	2	19.6	20.2
2	3	20.2	20.7
2	4	20.7	21.3
2	5	21.3	21.8
2	6	21.8	22.4
2	7	22.4	22.9
2	8	22.9	23.5
2	9	23.5	24.0
3	0	24.0	24.4
3	1	24.4	24.8
3	2	24.8	25.2
3	3	25.2	25.6

3	4	25.6	26.0
3	5	26.0	26.4
3	6	26.4	26.8
3	7	26.8	27.2
3	8	27.2	27.6
3	9	27.6	28.0
4	0	28.0	28.7
4	1	28.7	29.4
4	2	29.4	30.1
4	3	30.1	30.8
4	4	30.8	31.5
4	5	31.5	32.2
4	6	32.2	32.9
4	7	32.9	33.6
4	8	33.6	34.3
4	9	34.3	35.0
4	10	35.0	$+\infty$

Waist-to-Height Ratio

Signal ID: WAIST_TO_HEIGHT

Definition

Waist-to-height ratio is an individual's waist circumference expressed as a percentage of their height (with both measured in the same units). For the average person, Anura™ will estimate this to within 4 percentage points of its actual value.

Waist-to-height ratio is a particularly good predictor of cardiovascular disease risk. It is associated with cardiovascular disease risk factors like elevated total cholesterol and lower high-density lipoprotein (HDL).

On average, Anura™ will estimate your waist-to-height ratio to within 4 percentage points of its actual value.

For more information, see: Zhou, W., Wang, Y., Gu, X., Feng, Z. P., Lee, K., Peng, Y., & Barszczyk, A. (2020) Importance of general adiposity, visceral adiposity and vital signs in predicting blood biomarkers using machine learning. *International Journal of Clinical Practice*, e13664.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	25.00%
1	1	25.00%	27.00%
1	2	27.00%	29.00%
1	3	29.00%	31.00%
1	4	31.00%	33.00%
1	5	33.00%	35.00%

1	6	35.00%	37.00%
1	7	37.00%	39.00%
1	8	39.00%	41.00%
1	9	41.00%	43.00%
2	0	43.00%	44.00%
2	1	44.00%	45.00%
2	2	45.00%	46.00%
2	3	46.00%	47.00%
2	4	47.00%	48.00%
2	5	48.00%	49.00%
2	6	49.00%	50.00%
2	7	50.00%	51.00%
2	8	51.00%	52.00%
2	9	52.00%	53.00%
3	0	53.00%	53.50%
3	1	53.50%	54.00%
3	2	54.00%	54.50%
3	3	54.50%	55.00%
3	4	55.00%	55.50%
3	5	55.50%	56.00%
3	6	56.00%	56.50%

3	7	56.50%	57.00%
3	8	57.00%	57.50%
3	9	57.50%	58.00%
4	0	58.00%	58.50%
4	1	58.50%	59.00%
4	2	59.00%	59.50%
4	3	59.50%	60.00%
4	4	60.00%	60.50%
4	5	60.50%	61.00%
4	6	61.00%	61.50%
4	7	61.50%	62.00%
4	8	62.00%	62.50%
4	9	62.50%	63.00%
5	0	63.00%	64.20%
5	1	64.20%	65.40%
5	2	65.40%	66.60%
5	3	66.60%	67.80%
5	4	67.80%	69.00%
5	5	69.00%	70.20%
5	6	70.20%	71.40%

5	7	71.40%	72.60%
5	8	72.60%	73.80%
5	9	73.80%	75.00%
5	10	75.00%	+∞

Male - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	25.00%
1	1	25.00%	27.00%
1	2	27.00%	29.00%
1	3	29.00%	31.00%
1	4	31.00%	33.00%
1	5	33.00%	35.00%
1	6	35.00%	37.00%
1	7	37.00%	39.00%
1	8	39.00%	41.00%
1	9	41.00%	43.00%
2	0	43.00%	44.00%
2	1	44.00%	45.00%
2	2	45.00%	46.00%
2	3	46.00%	47.00%

2	4	47.00%	48.00%
2	5	48.00%	49.00%
2	6	49.00%	50.00%
2	7	50.00%	51.00%
2	8	51.00%	52.00%
2	9	52.00%	53.00%
3	0	53.00%	53.50%
3	1	53.50%	54.00%
3	2	54.00%	54.50%
3	3	54.50%	55.00%
3	4	55.00%	55.50%
3	5	55.50%	56.00%
3	6	56.00%	56.50%
3	7	56.50%	57.00%
3	8	57.00%	57.50%
3	9	57.50%	58.00%
4	0	58.00%	58.50%
4	1	58.50%	59.00%
4	2	59.00%	59.50%
4	3	59.50%	60.00%
4	4	60.00%	60.50%

4	5	60.50%	61.00%
4	6	61.00%	61.50%
4	7	61.50%	62.00%
4	8	62.00%	62.50%
4	9	62.50%	63.00%
5	0	63.00%	64.20%
5	1	64.20%	65.40%
5	2	65.40%	66.60%
5	3	66.60%	67.80%
5	4	67.80%	69.00%
5	5	69.00%	70.20%
5	6	70.20%	71.40%
5	7	71.40%	72.60%
5	8	72.60%	73.80%
5	9	73.80%	75.00%
5	10	75.00%	+∞

Male - East Asia

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	25.00%

1	1	25.00%	27.00%
1	2	27.00%	29.00%
1	3	29.00%	31.00%
1	4	31.00%	33.00%
1	5	33.00%	35.00%
1	6	35.00%	37.00%
1	7	37.00%	39.00%
1	8	39.00%	41.00%
1	9	41.00%	43.00%
2	0	43.00%	44.00%
2	1	44.00%	45.00%
2	2	45.00%	46.00%
2	3	46.00%	47.00%
2	4	47.00%	48.00%
2	5	48.00%	49.00%
2	6	49.00%	50.00%
2	7	50.00%	51.00%
2	8	51.00%	52.00%
2	9	52.00%	53.00%
3	0	53.00%	53.50%
3	1	53.50%	54.00%

3	2	54.00%	54.50%
3	3	54.50%	55.00%
3	4	55.00%	55.50%
3	5	55.50%	56.00%
3	6	56.00%	56.50%
3	7	56.50%	57.00%
3	8	57.00%	57.50%
3	9	57.50%	58.00%
4	0	58.00%	58.50%
4	1	58.50%	59.00%
4	2	59.00%	59.50%
4	3	59.50%	60.00%
4	4	60.00%	60.50%
4	5	60.50%	61.00%
4	6	61.00%	61.50%
4	7	61.50%	62.00%
4	8	62.00%	62.50%
4	9	62.50%	63.00%
5	0	63.00%	64.20%
5	1	64.20%	65.40%
5	2	65.40%	66.60%

5	3	66.60%	67.80%
5	4	67.80%	69.00%
5	5	69.00%	70.20%
5	6	70.20%	71.40%
5	7	71.40%	72.60%
5	8	72.60%	73.80%
5	9	73.80%	75.00%
5	10	75.00%	$+\infty$

Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	25.00%
1	1	25.00%	26.90%
1	2	26.90%	28.80%
1	3	28.80%	30.60%
1	4	30.60%	32.50%
1	5	32.50%	34.40%
1	6	34.40%	36.30%
1	7	36.30%	38.20%
1	8	38.20%	40.00%

1	9	40.00%	42.00%
2	0	42.00%	42.70%
2	1	42.70%	43.40%
2	2	43.40%	44.10%
2	3	44.10%	44.80%
2	4	44.80%	45.50%
2	5	45.50%	46.20%
2	6	46.20%	46.90%
2	7	46.90%	47.60%
2	8	47.60%	48.30%
2	9	48.30%	49.00%
3	0	49.00%	49.50%
3	1	49.50%	50.00%
3	2	50.00%	50.50%
3	3	50.50%	51.00%
3	4	51.00%	51.50%
3	5	51.50%	52.00%
3	6	52.00%	52.50%
3	7	52.50%	53.00%
3	8	53.00%	53.50%
3	9	53.50%	54.00%

4	0	54.00%	54.40%
4	1	54.40%	54.80%
4	2	54.80%	55.20%
4	3	55.20%	55.60%
4	4	55.60%	56.00%
4	5	56.00%	56.40%
4	6	56.40%	56.80%
4	7	56.80%	57.20%
4	8	57.20%	57.60%
4	9	57.60%	58.00%
5	0	58.00%	59.20%
5	1	59.20%	60.40%
5	2	60.40%	61.60%
5	3	61.60%	62.80%
5	4	62.80%	64.00%
5	5	64.00%	65.20%
5	6	65.20%	66.40%
5	7	66.40%	67.60%
5	8	67.60%	68.80%
5	9	68.80%	70.00%
5	10	70.00%	+∞

Female - East Asia

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	25.00%
1	1	25.00%	26.90%
1	2	26.90%	28.80%
1	3	28.80%	30.60%
1	4	30.60%	32.50%
1	5	32.50%	34.40%
1	6	34.40%	36.30%
1	7	36.30%	38.20%
1	8	38.20%	40.00%
1	9	40.00%	42.00%
2	0	42.00%	42.70%
2	1	42.70%	43.40%
2	2	43.40%	44.10%
2	3	44.10%	44.80%
2	4	44.80%	45.50%
2	5	45.50%	46.20%
2	6	46.20%	46.90%
2	7	46.90%	47.60%

2	8	47.60%	48.30%
2	9	48.30%	49.00%
3	0	49.00%	49.50%
3	1	49.50%	50.00%
3	2	50.00%	50.50%
3	3	50.50%	51.00%
3	4	51.00%	51.50%
3	5	51.50%	52.00%
3	6	52.00%	52.50%
3	7	52.50%	53.00%
3	8	53.00%	53.50%
3	9	53.50%	54.00%
4	0	54.00%	54.40%
4	1	54.40%	54.80%
4	2	54.80%	55.20%
4	3	55.20%	55.60%
4	4	55.60%	56.00%
4	5	56.00%	56.40%
4	6	56.40%	56.80%
4	7	56.80%	57.20%

4	8	57.20%	57.60%
4	9	57.60%	58.00%
5	0	58.00%	59.20%
5	1	59.20%	60.40%
5	2	60.40%	61.60%
5	3	61.60%	62.80%
5	4	62.80%	64.00%
5	5	64.00%	65.20%
5	6	65.20%	66.40%
5	7	66.40%	67.60%
5	8	67.60%	68.80%
5	9	68.80%	70.00%
5	10	70.00%	$+\infty$

Body Shape Index

Signal ID: ABSI

Definition

Body Shape Index is a measure of abdominal region size (as determined by waist circumference) relative to overall body size (as determined by Body Mass Index and height). A low Body Shape Index corresponds to a 'chilli pepper'-shaped body. As BSI increases, body shape resembles a pear, then a pineapple, and then an apple. A larger abdominal region suggests elevated levels of deep abdominal fat, which is associated with various health risks.

Body Shape Index is a particularly good predictor of mortality (from all causes), as well as a fair predictor of diabetes and cardiovascular diseases. It is associated with elevated triglyceride levels, which may partially contribute to the development of cardiovascular diseases.

For more information, see: Zhou, W., Wang, Y., Gu, X., Feng, Z. P., Lee, K., Peng, Y., & Barszczyk, A. (2020) Importance of general adiposity, visceral adiposity and vital signs in predicting blood biomarkers using machine learning. *International Journal of Clinical Practice*, e13664.

Interpretation Table

Female - East Asia

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00	6.19
1	1	6.19	6.24
1	2	6.24	6.29
1	3	6.29	6.33
1	4	6.33	6.38
1	5	6.38	6.43

1	6	6.43	6.48
1	7	6.48	6.53
1	8	6.53	6.58
1	9	6.58	6.63
2	0	6.63	6.67
2	1	6.67	6.71
2	2	6.71	6.76
2	3	6.76	6.80
2	4	6.80	6.85
2	5	6.85	6.89
2	6	6.89	6.93
2	7	6.93	6.98
2	8	6.98	7.02
2	9	7.02	7.07
3	0	7.07	7.16
3	1	7.16	7.24
3	2	7.24	7.33
3	3	7.33	7.42
3	4	7.42	7.51
3	5	7.51	7.60
3	6	7.60	7.68

3	7	7.68	7.77
3	8	7.77	7.86
3	9	7.86	7.95
4	0	7.95	7.99
4	1	7.99	8.04
4	2	8.04	8.08
4	3	8.08	8.13
4	4	8.13	8.17
4	5	8.17	8.21
4	6	8.21	8.26
4	7	8.26	8.30
4	8	8.30	8.35
4	9	8.35	8.39
5	0	8.39	8.43
5	1	8.43	8.48
5	2	8.48	8.52
5	3	8.52	8.57
5	4	8.57	8.61
5	5	8.61	8.65
5	6	8.65	8.70
5	7	8.70	8.74

5	8	8.74	8.79
5	9	8.79	8.83
5	10	8.83	$+\infty$

Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00	6.20
1	1	6.20	6.27
1	2	6.27	6.33
1	3	6.33	6.40
1	4	6.40	6.47
1	5	6.47	6.53
1	6	6.53	6.60
1	7	6.60	6.67
1	8	6.67	6.73
1	9	6.73	6.80
2	0	6.80	6.86
2	1	6.86	6.92
2	2	6.92	6.98
2	3	6.98	7.04

2	4	7.04	7.10
2	5	7.10	7.16
2	6	7.16	7.22
2	7	7.22	7.28
2	8	7.28	7.34
2	9	7.34	7.40
3	0	7.40	7.52
3	1	7.52	7.64
3	2	7.64	7.76
3	3	7.76	7.88
3	4	7.88	8.00
3	5	8.00	8.12
3	6	8.12	8.24
3	7	8.24	8.36
3	8	8.36	8.48
3	9	8.48	8.60
4	0	8.60	8.66
4	1	8.66	8.72
4	2	8.72	8.78
4	3	8.78	8.84
4	4	8.84	8.90

4	5	8.90	8.96
4	6	8.96	9.02
4	7	9.02	9.08
4	8	9.08	9.14
4	9	9.14	9.20
5	0	9.20	9.26
5	1	9.26	9.32
5	2	9.32	9.38
5	3	9.38	9.44
5	4	9.44	9.50
5	5	9.50	9.56
5	6	9.56	9.62
5	7	9.62	9.68
5	8	9.68	9.74
5	9	9.74	9.80
5	10	9.80	+∞

Male - East Asia

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00	6.75
1	1	6.75	6.79

1	2	6.79	6.83
1	3	6.83	6.87
1	4	6.87	6.92
1	5	6.92	6.96
1	6	6.96	7.00
1	7	7.00	7.04
1	8	7.04	7.08
1	9	7.08	7.12
2	0	7.12	7.16
2	1	7.16	7.20
2	2	7.20	7.23
2	3	7.23	7.27
2	4	7.27	7.31
2	5	7.31	7.34
2	6	7.34	7.38
2	7	7.38	7.42
2	8	7.42	7.46
2	9	7.46	7.49
3	0	7.49	7.57
3	1	7.57	7.64
3	2	7.64	7.71

3	3	7.71	7.79
3	4	7.79	7.86
3	5	7.86	7.94
3	6	7.94	8.01
3	7	8.01	8.08
3	8	8.08	8.16
3	9	8.16	8.23
4	0	8.23	8.27
4	1	8.27	8.31
4	2	8.31	8.34
4	3	8.34	8.38
4	4	8.38	8.42
4	5	8.42	8.45
4	6	8.45	8.49
4	7	8.49	8.53
4	8	8.53	8.56
4	9	8.56	8.60
5	0	8.60	8.64
5	1	8.64	8.67
5	2	8.67	8.71

5	3	8.71	8.75
5	4	8.75	8.79
5	5	8.79	8.82
5	6	8.82	8.86
5	7	8.86	8.90
5	8	8.90	8.93
5	9	8.93	8.97
5	10	8.97	+∞

Male - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00	6.60
1	1	6.60	6.66
1	2	6.66	6.71
1	3	6.71	6.77
1	4	6.77	6.82
1	5	6.82	6.88
1	6	6.88	6.93
1	7	6.93	6.99
1	8	6.99	7.04
1	9	7.04	7.10

2	0	7.10	7.15
2	1	7.15	7.20
2	2	7.20	7.25
2	3	7.25	7.30
2	4	7.30	7.35
2	5	7.35	7.40
2	6	7.40	7.45
2	7	7.45	7.50
2	8	7.50	7.55
2	9	7.55	7.60
3	0	7.60	7.70
3	1	7.70	7.80
3	2	7.80	7.90
3	3	7.90	8.00
3	4	8.00	8.10
3	5	8.10	8.20
3	6	8.20	8.30
3	7	8.30	8.40
3	8	8.40	8.50
3	9	8.50	8.60
4	0	8.60	8.65

4	1	8.65	8.70
4	2	8.70	8.75
4	3	8.75	8.80
4	4	8.80	8.85
4	5	8.85	8.90
4	6	8.90	8.95
4	7	8.95	9.00
4	8	9.00	9.05
4	9	9.05	9.10
5	0	9.10	9.15
5	1	9.15	9.20
5	2	9.20	9.25
5	3	9.25	9.30
5	4	9.30	9.35
5	5	9.35	9.40
5	6	9.40	9.45
5	7	9.45	9.50
5	8	9.50	9.55
5	9	9.55	9.60
5	10	9.60	+∞

Facial Skin Age

Signal ID: AGE

Definition

Skin Age is an estimate of your age based on the condition of the surface of your face.

This estimation can be used as an indicator for your facial skin aging.

This estimation may be influenced by many factors such as fatigue level, the use of skincare or cosmetics products.

Video images taken in poor lighting conditions (e.g., backlighting, overhead lighting) may distort the estimation of your facial skin age.

Cardiovascular Disease Risk

Signal ID: BP_CVD

Definition

Cardiovascular Disease Risk is your likelihood of experiencing your first heart attack or stroke within the next 10 years, expressed as a percentage.

This risk score considers your gender, age, Body Mass Index, systolic blood pressure and antihypertensive medication status, as well as your smoking status and diabetes status when available. It was developed using the Framingham method. It is based on data from prospective studies that followed participants' cardiovascular health for over 10 years.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	0.50%
1	1	0.50%	1.00%
1	2	1.00%	1.50%
1	3	1.50%	2.00%
1	4	2.00%	2.50%
1	5	2.50%	3.00%
1	6	3.00%	3.50%
1	7	3.50%	4.00%
1	8	4.00%	4.50%

1	9	4.50%	5.00%
2	0	5.00%	5.25%
2	1	5.25%	5.50%
2	2	5.50%	5.75%
2	3	5.75%	6.00%
2	4	6.00%	6.25%
2	5	6.25%	6.50%
2	6	6.50%	6.75%
2	7	6.75%	7.00%
2	8	7.00%	7.25%
3	9	7.25%	7.50%
3	0	7.50%	7.75%
3	1	7.75%	8.00%
3	2	8.00%	8.25%
3	3	8.25%	8.50%
3	4	8.50%	8.75%
3	5	8.75%	9.00%
3	6	9.00%	9.25%
3	7	9.25%	9.50%
3	8	9.50%	9.75%
3	9	9.75%	10.00%

4	0	10.00%	11.00%
4	1	11.00%	12.00%
4	2	12.00%	13.00%
4	3	13.00%	14.00%
4	4	14.00%	15.00%
4	5	15.00%	16.00%
4	6	16.00%	17.00%
4	7	17.00%	18.00%
4	8	18.00%	19.00%
4	9	19.00%	20.00%
5	0	20.00%	28.00%
5	1	28.00%	36.00%
5	2	36.00%	44.00%
5	3	44.00%	52.00%
5	4	52.00%	60.00%
5	5	60.00%	68.00%
5	6	68.00%	76.00%
5	7	76.00%	84.00%
5	8	84.00%	92.00%
5	9	92.00%	100.00%
5	10	100.00%	+∞

Heart Attack Risk

Signal ID: BP_HEART_ATTACK

Definition

Heart Attack Risk is your likelihood of experiencing your first heart attack within the next 10 years, expressed as a percentage.

This risk score considers your gender, age, Body Mass Index, systolic blood pressure and antihypertensive medication status, as well as your smoking status and diabetes status when available. It was developed using the Framingham method. It is based on data from prospective studies that followed participants' cardiovascular health for over 10 years.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	0.17%
1	1	0.17%	0.33%
1	2	0.33%	0.50%
1	3	0.50%	0.66%
1	4	0.66%	0.83%
1	5	0.83%	0.99%
1	6	0.99%	1.16%
1	7	1.16%	1.32%
1	8	1.32%	1.49%

1	9	1.49%	1.65%
2	0	1.65%	1.73%
2	1	1.73%	1.82%
2	2	1.82%	1.90%
2	3	1.90%	1.98%
2	4	1.98%	2.06%
2	5	2.06%	2.15%
2	6	2.15%	2.23%
2	7	2.23%	2.31%
2	8	2.31%	2.39%
3	9	2.39%	2.48%
3	0	2.48%	2.56%
3	1	2.56%	2.64%
3	2	2.64%	2.72%
3	3	2.72%	2.81%
3	4	2.81%	2.89%
3	5	2.89%	2.97%
3	6	2.97%	3.05%
3	7	3.05%	3.14%
3	8	3.14%	3.22%
3	9	3.22%	3.30%

4	0	3.30%	3.63%
4	1	3.63%	3.96%
4	2	3.96%	4.29%
4	3	4.29%	4.62%
4	4	4.62%	4.95%
4	5	4.95%	5.28%
4	6	5.28%	5.61%
4	7	5.61%	5.94%
4	8	5.94%	6.27%
4	9	6.27%	6.60%
5	0	6.60%	9.24%
5	1	9.24%	11.88%
5	2	11.88%	14.52%
5	3	14.52%	17.16%
5	4	17.16%	19.80%
5	5	19.80%	22.44%
5	6	22.44%	25.08%
5	7	25.08%	27.72%
5	8	27.72%	30.36%
5	9	30.36%	33.00%
5	10	33.00%	+∞

Stroke Risk

Signal ID: BP_STROKE

Definition

Stroke Risk is your likelihood of experiencing your first stroke within the next 10 years, expressed as a percentage.

This risk score considers your gender, age, Body Mass Index, systolic blood pressure and antihypertensive medication status, as well as your smoking status and diabetes status (males only) when available. It was developed using the Framingham method. It is based on data from prospective studies that followed participants' cardiovascular health for over 10 years.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	0.33%
1	1	0.33%	0.66%
1	2	0.66%	0.99%
1	3	0.99%	1.32%
1	4	1.32%	1.65%
1	5	1.65%	1.98%
1	6	1.98%	2.31%
1	7	2.31%	2.64%
1	8	2.64%	2.97%

1	9	2.97%	3.30%
2	0	3.30%	3.47%
2	1	3.47%	3.63%
2	2	3.63%	3.80%
2	3	3.80%	3.96%
2	4	3.96%	4.13%
2	5	4.13%	4.29%
2	6	4.29%	4.46%
2	7	4.46%	4.62%
2	8	4.62%	4.79%
3	9	4.79%	4.95%
3	0	4.95%	5.12%
3	1	5.12%	5.28%
3	2	5.28%	5.45%
3	3	5.45%	5.61%
3	4	5.61%	5.78%
3	5	5.78%	5.94%
3	6	5.94%	6.11%
3	7	6.11%	6.27%
3	8	6.27%	6.44%
3	9	6.44%	6.60%

4	0	6.60%	7.26%
4	1	7.26%	7.92%
4	2	7.92%	8.58%
4	3	8.58%	9.24%
4	4	9.24%	9.90%
4	5	9.90%	10.56%
4	6	10.56%	11.22%
4	7	11.22%	11.88%
4	8	11.88%	12.54%
4	9	12.54%	13.20%
5	0	13.20%	18.48%
5	1	18.48%	23.76%
5	2	23.76%	29.04%
5	3	29.04%	34.32%
5	4	34.32%	39.60%
5	5	39.60%	44.88%
5	6	44.88%	50.16%
5	7	50.16%	55.44%
5	8	55.44%	60.72%
5	9	60.72%	66.00%
5	10	66.00%	+∞

Hypertension risk

Signal ID: HPT_RISK_PROB

Definition

Hypertension risk corresponds to the percentage of people with the user's risk profile who are diagnosed with hypertension (high blood pressure) by their doctor.

This risk profile is based on their facial blood flow and demographic information.

Hypertension is a major treatable risk factor for cardiovascular disease. Therefore, those with a high hypertension risk should consider getting screened for hypertension by their doctor.

Notice: Moment-to-moment fluctuations in your physiology mean that your risk estimates could vary to some degree from one measurement to the next. The best estimate of your overall risk is therefore obtained by averaging several measurements throughout the day and across several days to adequately account for this physiological variation.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	2.00%
1	1	2.00%	4.00%
1	2	4.00%	6.00%
1	3	6.00%	8.00%
1	4	8.00%	10.00%
1	5	10.00%	12.00%
1	6	12.00%	14.00%

1	7	14.00%	16.00%
1	8	16.00%	18.00%
1	9	18.00%	20.00%
2	0	20.00%	22.00%
2	1	22.00%	24.00%
2	2	24.00%	26.00%
2	3	26.00%	28.00%
2	4	28.00%	30.00%
2	5	30.00%	32.00%
2	6	32.00%	34.00%
2	7	34.00%	36.00%
2	8	36.00%	38.00%
2	9	38.00%	40.00%
3	0	40.00%	42.00%
3	1	42.00%	44.00%
3	2	44.00%	46.00%
3	3	46.00%	48.00%
3	4	48.00%	50.00%
3	5	50.00%	52.00%
3	6	52.00%	54.00%
3	7	54.00%	56.00%

3	8	56.00%	58.00%
3	9	58.00%	60.00%
4	0	60.00%	62.00%
4	1	62.00%	64.00%
4	2	64.00%	66.00%
4	3	66.00%	68.00%
4	4	68.00%	70.00%
4	5	70.00%	72.00%
4	6	72.00%	74.00%
4	7	74.00%	76.00%
4	8	76.00%	78.00%
4	9	78.00%	80.00%
5	0	80.00%	82.00%
5	1	82.00%	84.00%
5	2	84.00%	86.00%
5	3	86.00%	88.00%
5	4	88.00%	90.00%
5	5	90.00%	92.00%
5	6	92.00%	94.00%
5	7	94.00%	96.00%

5	8	96.00%	98.00%
5	9	98.00%	100.00%
5	10	100.00%	$+\infty$

Type 2 Diabetes Risk

Signal ID: DBT_RISK_PROB

Definition

Type 2 diabetes risk corresponds to the percentage of people with the user's risk profile who are diagnosed with type 2 diabetes (impaired processing of blood sugar) by their doctor.

This risk profile is based on their facial blood flow and demographic information. It does not necessarily reflect the user's current blood sugar level.

Uncontrolled type 2 diabetes can cause problems like vascular disease, heart disease, kidney damage, and nerve damage. Therefore, those with a high type 2 diabetes risk should consider getting screened for type 2 diabetes by their doctor.

Notice: Moment-to-moment fluctuations in your physiology mean that your risk estimates could vary to some degree from one measurement to the next. The best estimate of your overall risk is therefore obtained by averaging several measurements throughout the day and across several days to adequately account for this physiological variation.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	2.00%
1	1	2.00%	4.00%
1	2	4.00%	6.00%
1	3	6.00%	8.00%
1	4	8.00%	10.00%
1	5	10.00%	12.00%

1	6	12.00%	14.00%
1	7	14.00%	16.00%
1	8	16.00%	18.00%
1	9	18.00%	20.00%
2	0	20.00%	22.00%
2	1	22.00%	24.00%
2	2	24.00%	26.00%
2	3	26.00%	28.00%
2	4	28.00%	30.00%
2	5	30.00%	32.00%
2	6	32.00%	34.00%
2	7	34.00%	36.00%
2	8	36.00%	38.00%
2	9	38.00%	40.00%
3	0	40.00%	42.00%
3	1	42.00%	44.00%
3	2	44.00%	46.00%
3	3	46.00%	48.00%
3	4	48.00%	50.00%
3	5	50.00%	52.00%
3	6	52.00%	54.00%

3	7	54.00%	56.00%
3	8	56.00%	58.00%
3	9	58.00%	60.00%
4	0	60.00%	62.00%
4	1	62.00%	64.00%
4	2	64.00%	66.00%
4	3	66.00%	68.00%
4	4	68.00%	70.00%
4	5	70.00%	72.00%
4	6	72.00%	74.00%
4	7	74.00%	76.00%
4	8	76.00%	78.00%
4	9	78.00%	80.00%
5	0	80.00%	82.00%
5	1	82.00%	84.00%
5	2	84.00%	86.00%
5	3	86.00%	88.00%
5	4	88.00%	90.00%
5	5	90.00%	92.00%
5	6	92.00%	94.00%

5	7	94.00%	96.00%
5	8	96.00%	98.00%
5	9	98.00%	100.00%
5	10	100.00%	$+\infty$

Hypercholesterolemia risk

Signal ID: HDLTC_RISK_PROB

Definition

Hypercholesterolemia risk corresponds to the percentage of people with the user's risk profile who have abnormally high cholesterol levels (defined as a total cholesterol (TC)-to-high density lipoprotein (HDL) cholesterol ("good cholesterol") ratio of 4.3 or higher).

This risk profile is based on their facial blood flow and demographic information.

Hypercholesterolemia is a treatable risk factor for cardiovascular disease. Therefore, those with a high hypercholesterolemia risk should talk to their doctor about having their HDL and total cholesterol levels checked with a blood test.

Notice: Moment-to-moment fluctuations in your physiology mean that your risk estimates could vary to some degree from one measurement to the next. The best estimate of your overall risk is therefore obtained by averaging several measurements throughout the day and across several days to adequately account for this physiological variation.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	2.00%
1	1	2.00%	4.00%
1	2	4.00%	6.00%
1	3	6.00%	8.00%
1	4	8.00%	10.00%
1	5	10.00%	12.00%

1	6	12.00%	14.00%
1	7	14.00%	16.00%
1	8	16.00%	18.00%
1	9	18.00%	20.00%
2	0	20.00%	22.00%
2	1	22.00%	24.00%
2	2	24.00%	26.00%
2	3	26.00%	28.00%
2	4	28.00%	30.00%
2	5	30.00%	32.00%
2	6	32.00%	34.00%
2	7	34.00%	36.00%
2	8	36.00%	38.00%
2	9	38.00%	40.00%
3	0	40.00%	42.00%
3	1	42.00%	44.00%
3	2	44.00%	46.00%
3	3	46.00%	48.00%
3	4	48.00%	50.00%
3	5	50.00%	52.00%
3	6	52.00%	54.00%

3	7	54.00%	56.00%
3	8	56.00%	58.00%
3	9	58.00%	60.00%
4	0	60.00%	62.00%
4	1	62.00%	64.00%
4	2	64.00%	66.00%
4	3	66.00%	68.00%
4	4	68.00%	70.00%
4	5	70.00%	72.00%
4	6	72.00%	74.00%
4	7	74.00%	76.00%
4	8	76.00%	78.00%
4	9	78.00%	80.00%
5	0	80.00%	82.00%
5	1	82.00%	84.00%
5	2	84.00%	86.00%
5	3	86.00%	88.00%
5	4	88.00%	90.00%
5	5	90.00%	92.00%
5	6	92.00%	94.00%

5	7	94.00%	96.00%
5	8	96.00%	98.00%
5	9	98.00%	100.00%
5	10	100.00%	$+\infty$

Hypertriglyceridemia risk

Signal ID: TG_RISK_PROB

Definition

Hypertriglyceridemia risk corresponds to the percentage of people with the user's risk profile who have abnormally high triglyceride levels (above 1.7 mmol/L or 150 mg/dL).

This risk profile is based on their facial blood flow and demographic information.

Hypertriglyceridemia in combination with other factors is a treatable risk factor for cardiovascular disease. Therefore, those with a high hypertriglyceridemia risk should talk to their doctor about having their triglyceride levels checked with a blood test.

Notice: Moment-to-moment fluctuations in your physiology mean that your risk estimates could vary to some degree from one measurement to the next. The best estimate of your overall risk is therefore obtained by averaging several measurements throughout the day and across several days to adequately account for this physiological variation.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0.00%	2.00%
1	1	2.00%	4.00%
1	2	4.00%	6.00%
1	3	6.00%	8.00%
1	4	8.00%	10.00%
1	5	10.00%	12.00%

1	6	12.00%	14.00%
1	7	14.00%	16.00%
1	8	16.00%	18.00%
1	9	18.00%	20.00%
2	0	20.00%	22.00%
2	1	22.00%	24.00%
2	2	24.00%	26.00%
2	3	26.00%	28.00%
2	4	28.00%	30.00%
2	5	30.00%	32.00%
2	6	32.00%	34.00%
2	7	34.00%	36.00%
2	8	36.00%	38.00%
2	9	38.00%	40.00%
3	0	40.00%	42.00%
3	1	42.00%	44.00%
3	2	44.00%	46.00%
3	3	46.00%	48.00%
3	4	48.00%	50.00%
3	5	50.00%	52.00%
3	6	52.00%	54.00%

3	7	54.00%	56.00%
3	8	56.00%	58.00%
3	9	58.00%	60.00%
4	0	60.00%	62.00%
4	1	62.00%	64.00%
4	2	64.00%	66.00%
4	3	66.00%	68.00%
4	4	68.00%	70.00%
4	5	70.00%	72.00%
4	6	72.00%	74.00%
4	7	74.00%	76.00%
4	8	76.00%	78.00%
4	9	78.00%	80.00%
5	0	80.00%	82.00%
5	1	82.00%	84.00%
5	2	84.00%	86.00%
5	3	86.00%	88.00%
5	4	88.00%	90.00%
5	5	90.00%	92.00%
5	6	92.00%	94.00%
5	7	94.00%	96.00%

5	8	96.00%	98.00%
5	9	98.00%	100.00%
5	10	100.00%	$+\infty$

General Wellness Score

Signal ID: HEALTH_SCORE

Definition

General Wellness Score is a measure of your overall physiological health based on a combined calculation of your most essential vitals including:

- Heart rate
- Stress
- Blood Pressure
- Heart Rate Variability
- Body Mass Index
- Cardiac Workload
- Waist-to-height Ratio
- Body Shape Index
- Cardiovascular Disease Risks

The higher your General Wellness Score, the better your health.

Interpretation Table

Male / Female - Global

Colour Group	Subscale	Minimum Value	Maximum Value
1	0	0	2
1	1	2	4
1	2	4	6
1	3	6	8
1	4	8	10

1	5	10	12
1	6	12	14
1	7	14	16
1	8	16	18
1	9	18	20
2	0	20	22
2	1	22	24
2	2	24	26
2	3	26	28
2	4	28	30
2	5	30	32
2	6	32	34
2	7	34	36
2	8	36	38
2	9	38	40
3	0	40	42
3	1	42	44
3	2	44	46
3	3	46	48
3	4	48	50
3	5	50	52

3	6	52	54
3	7	54	56
3	8	56	58
3	9	58	60
4	0	60	62
4	1	62	64
4	2	64	66
4	3	66	68
4	4	68	70
4	5	70	72
4	6	72	74
4	7	74	76
4	8	76	78
4	9	78	80
5	0	80	82
5	1	82	84
5	2	84	86
5	3	86	88
5	4	88	90
5	5	90	92

5	6	92	94
5	7	94	96
5	8	96	98
5	9	98	100
5	10	100	$+\infty$

Best Practices

License Registration and Token Validation

1. On app first install, use the provided DeepAffex™ license key to register the license by calling the `Organizations.RegisterLicense` endpoint
2. Please store tokens safely in the device's secure storage. Tokens must be used for any subsequent DeepAffex™ API calls.
3. To ensure that a token is valid before making a DeepAffex™ Cloud API call, you can call the `General.VerifyToken` endpoint which will return the token's status.

If the `ActiveLicense` field in the response is "false" or if the API returns one of the following errors: "INVALID_TOKEN", "LICENSE_EXPIRED", "INACTIVE_LICENSE" or "INACTIVE_DEVICE" then the app must re-register the license.

If attempting to re-registering the license fails due to license expiry, please contact Nuralogix to renew your license.

Cross-Platform Apps

Anura™ Core is a native SDK for iOS and Android. It can be integrated into applications that are built using cross-platform frameworks such as React Native, Flutter, Cordova, and Ionic.

We recommend that you follow the official guides of the cross-platform framework of your choice to integrate it into your application. The links below are to the native component integration section in the official guides of some of the most common cross-platform frameworks:

- [React Native iOS](#)
- [React Native Android](#)
- [Flutter](#)
- [Cordova](#)
- [Ionic](#)