

Emotion iOS App

Ed Arenberg
CTO, EPage
arenberg@e-page.com

Emotion iOS App

- Use iPhone / iPad camera
- Extract primary face
- Determine emotion
- Realtime?

Emotion iOS App - Attempt 1

- AVFoundation - camera frames
- Vision Framework
 - Face regions
- Extract face
- Send to Google Cloud Vision
- Emotion?



Process face as an unaltered image

**Success
but Very
Slow !**



Emotion iOS App - Attempt 2

- AVFoundation - camera frames
- Vision Framework
 - Face regions
- Extract face
- ML Emotion Model
- Emotion?



Process face as an unaltered image

Fail !



Emotion iOS App - Attempt 3

- AVFoundation - camera frames
- Vision Framework
 - Face regions
- Extract face
- Process image
- ML Emotion Model
- Emotion?

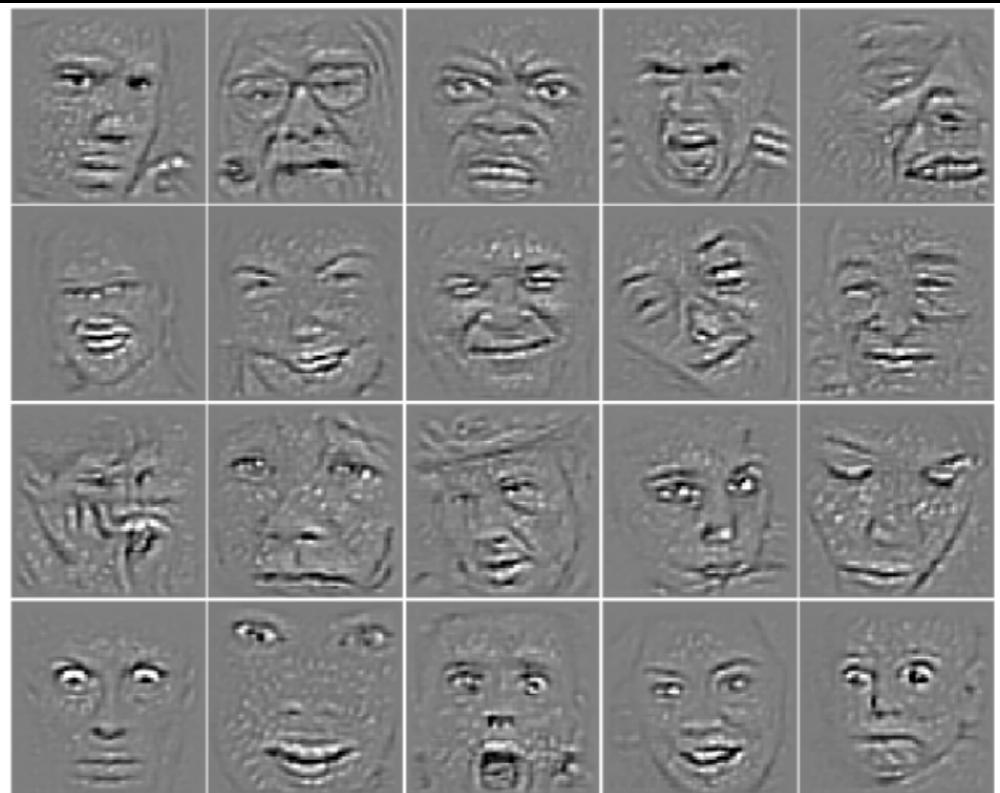


Guided back-prop



Process face as a
filtered image

Fail !



Emotion iOS App - Attempt 4

- ARKit - camera frames
 - Face regions
- Extract face anchors / markers
- ML Emotion Model
- Emotion?



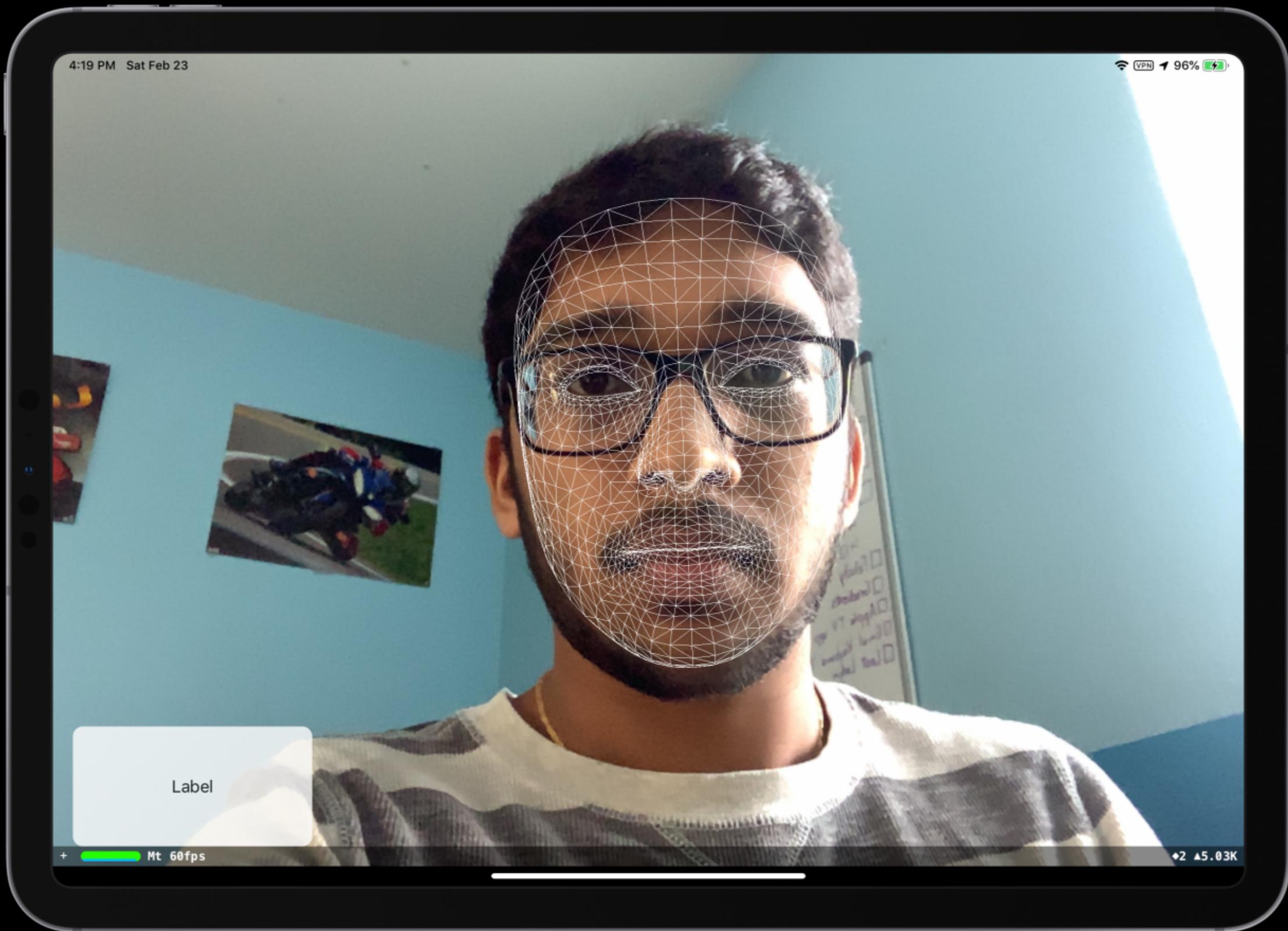
Process face as a
array of markers

Success !

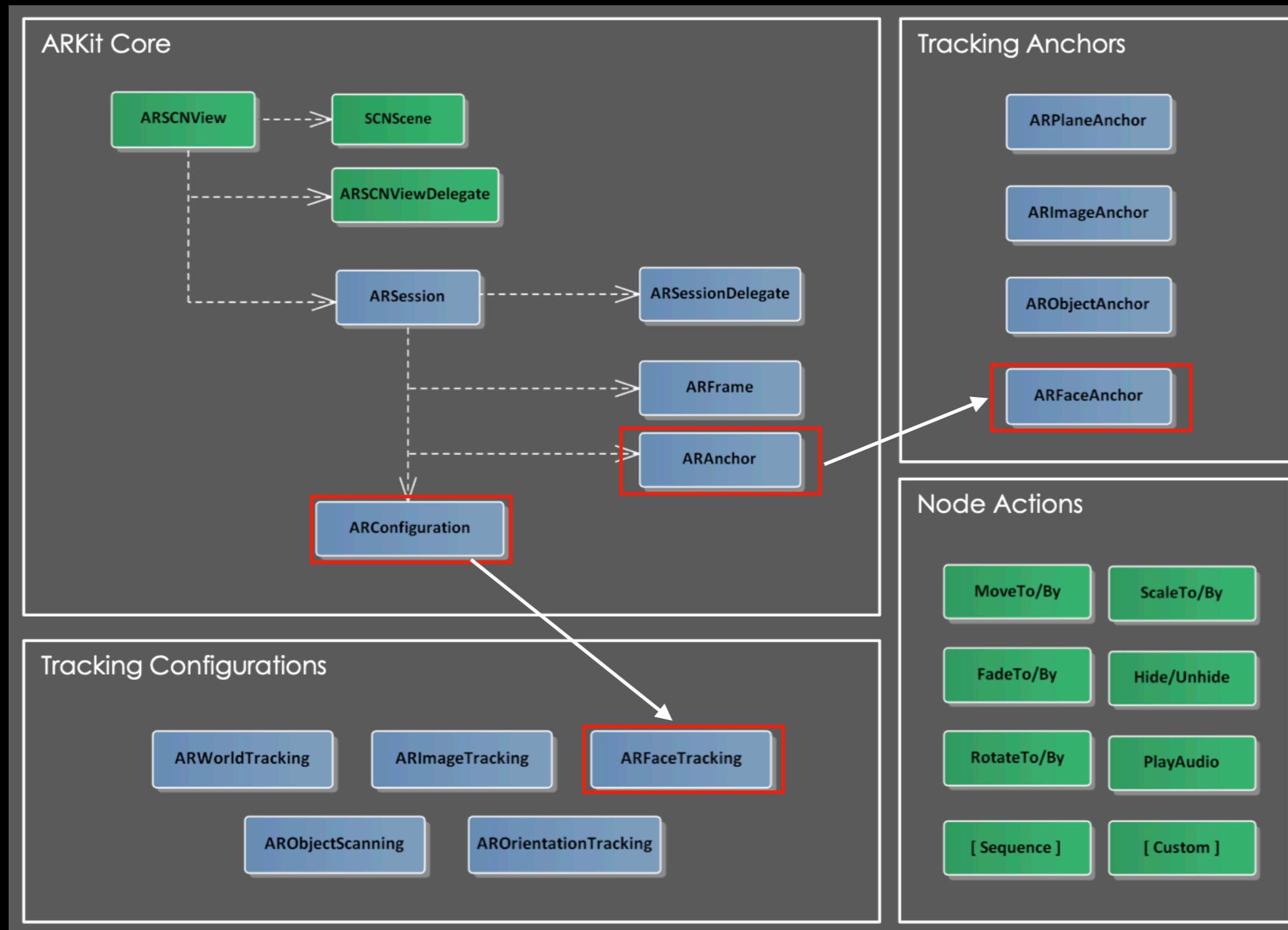


Emotion iOS App - How it works





ARKit Architecture



ARFaceAnchor.BlendShapeLocation

Left Eye

static let `eyeBlinkLeft`: ARFaceAnchor.BlendShapeLocation

The coefficient describing closure of the eyelids over the left eye.

static let `eyeLookDownLeft`: ARFaceAnchor.BlendShapeLocation

The coefficient describing movement of the left eyelids consistent with a downward gaze.

static let `eyeLookInLeft`: ARFaceAnchor.BlendShapeLocation

The coefficient describing movement of the left eyelids consistent with a rightward gaze.

static let `eyeLookOutLeft`: ARFaceAnchor.BlendShapeLocation

The coefficient describing movement of the left eyelids consistent with a leftward gaze.

static let `eyeLookUpLeft`: ARFaceAnchor.BlendShapeLocation

The coefficient describing movement of the left eyelids consistent with an upward gaze.

static let `eyeSquintLeft`: ARFaceAnchor.BlendShapeLocation

The coefficient describing contraction of the face around the left eye.

static let `eyeWideLeft`: ARFaceAnchor.BlendShapeLocation

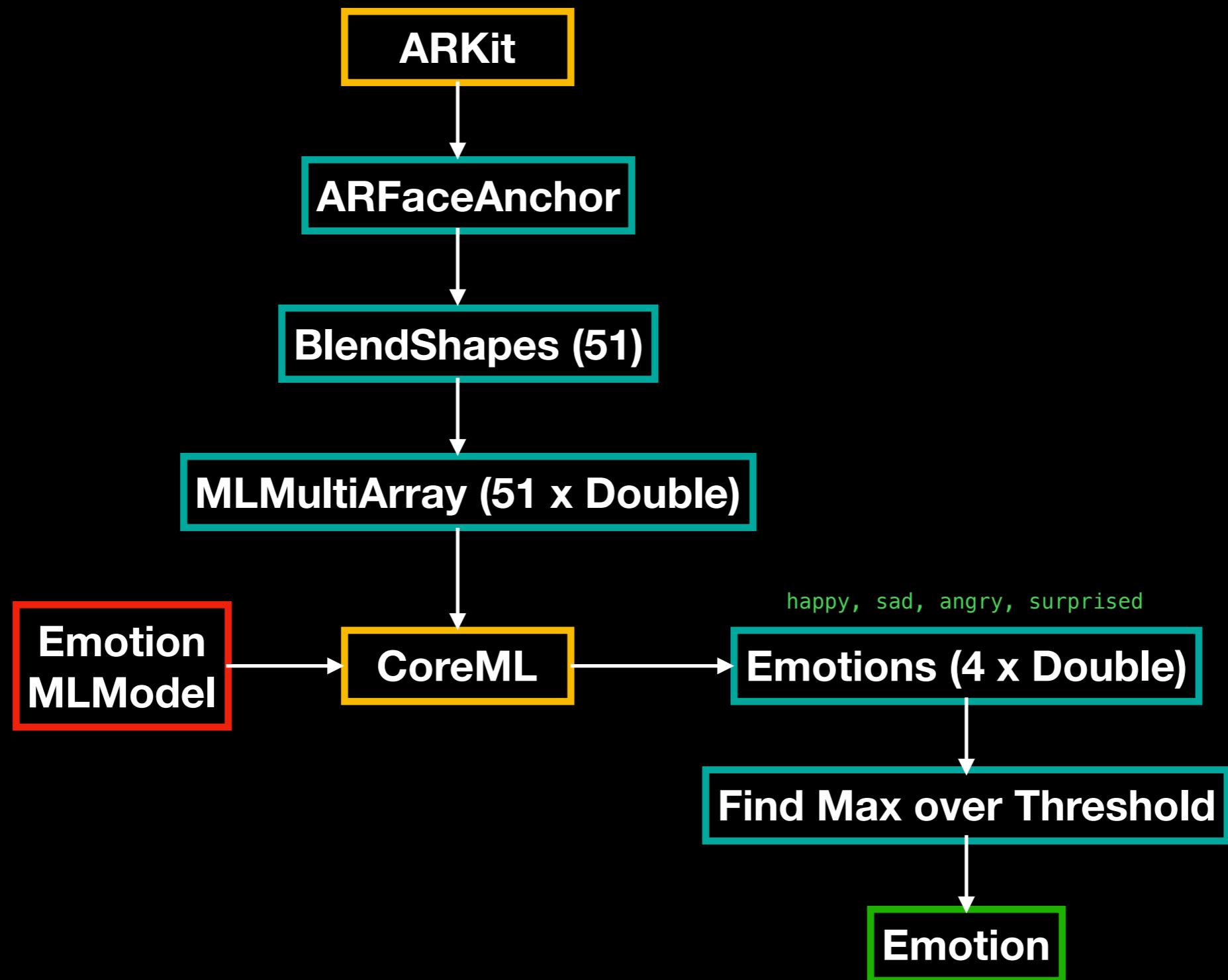
The coefficient describing a widening of the eyelids around the left eye.

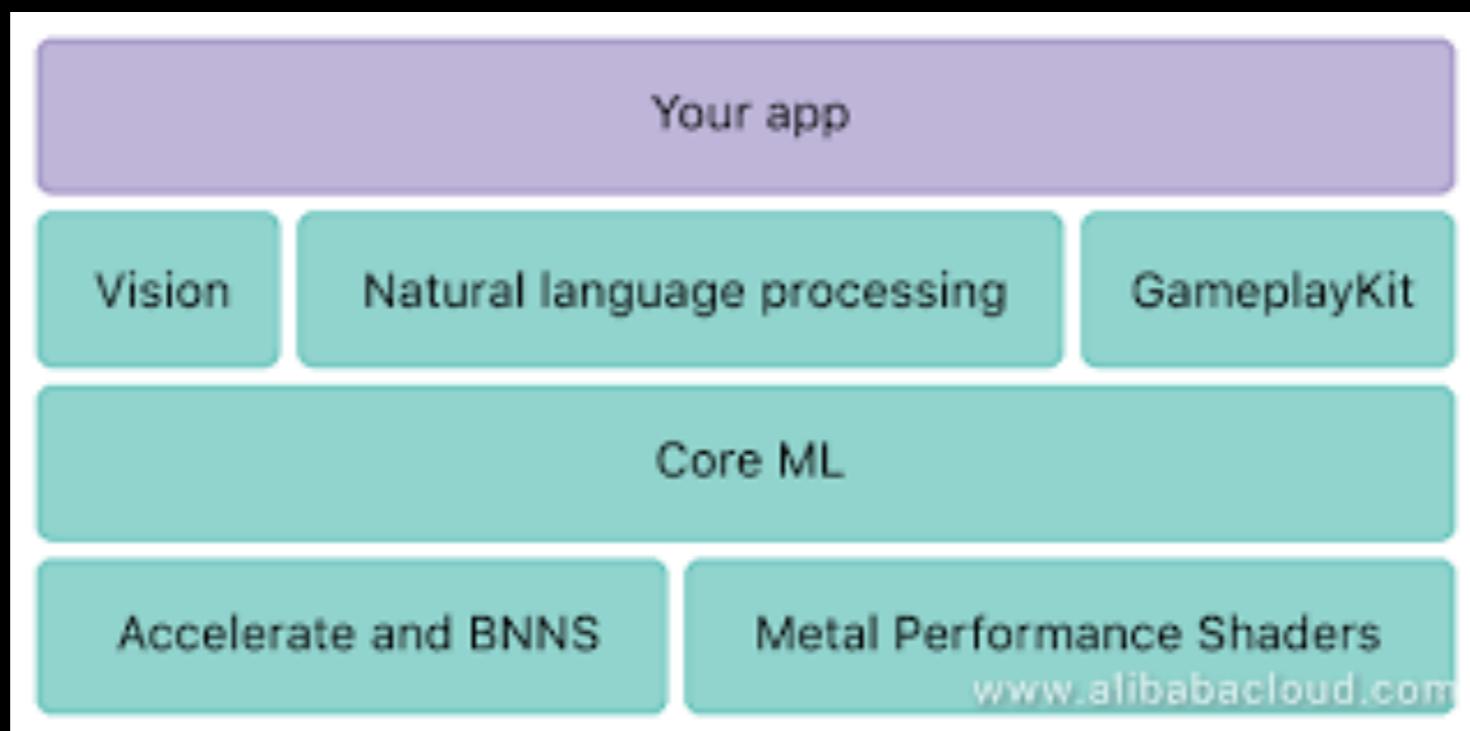
7:42 ↗

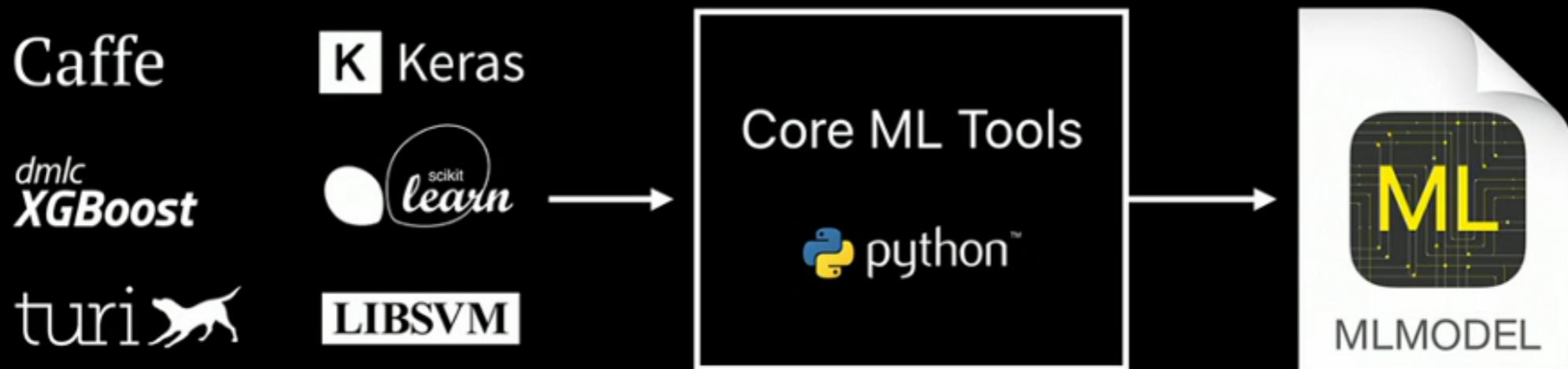
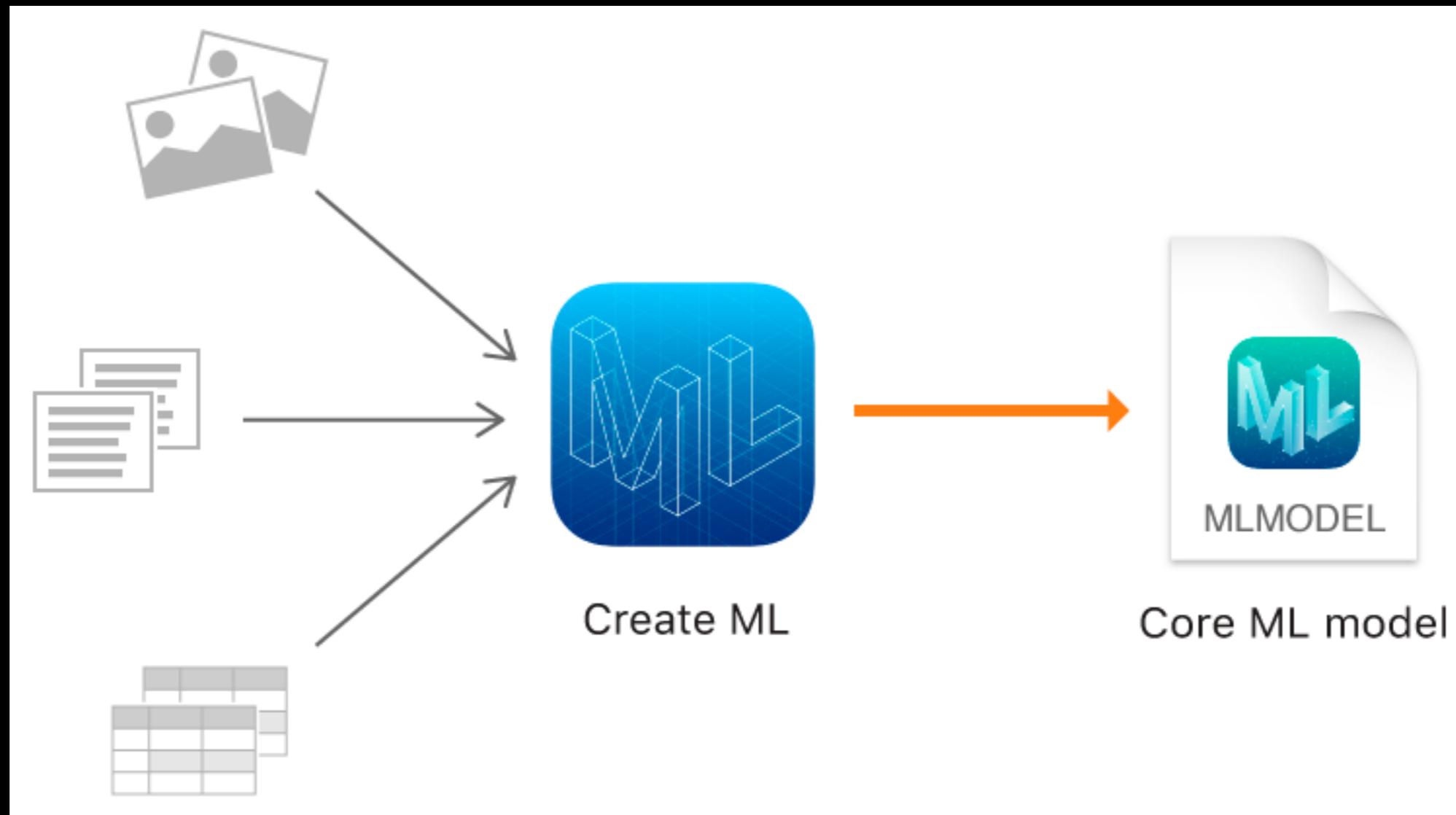
Neutral



Rear Front







Emotion iOS App

- <https://github.com/EPage-Ed/Emotion.git>
- FaceID required
 - iPhone X and newer, iPad Pro (newest)

