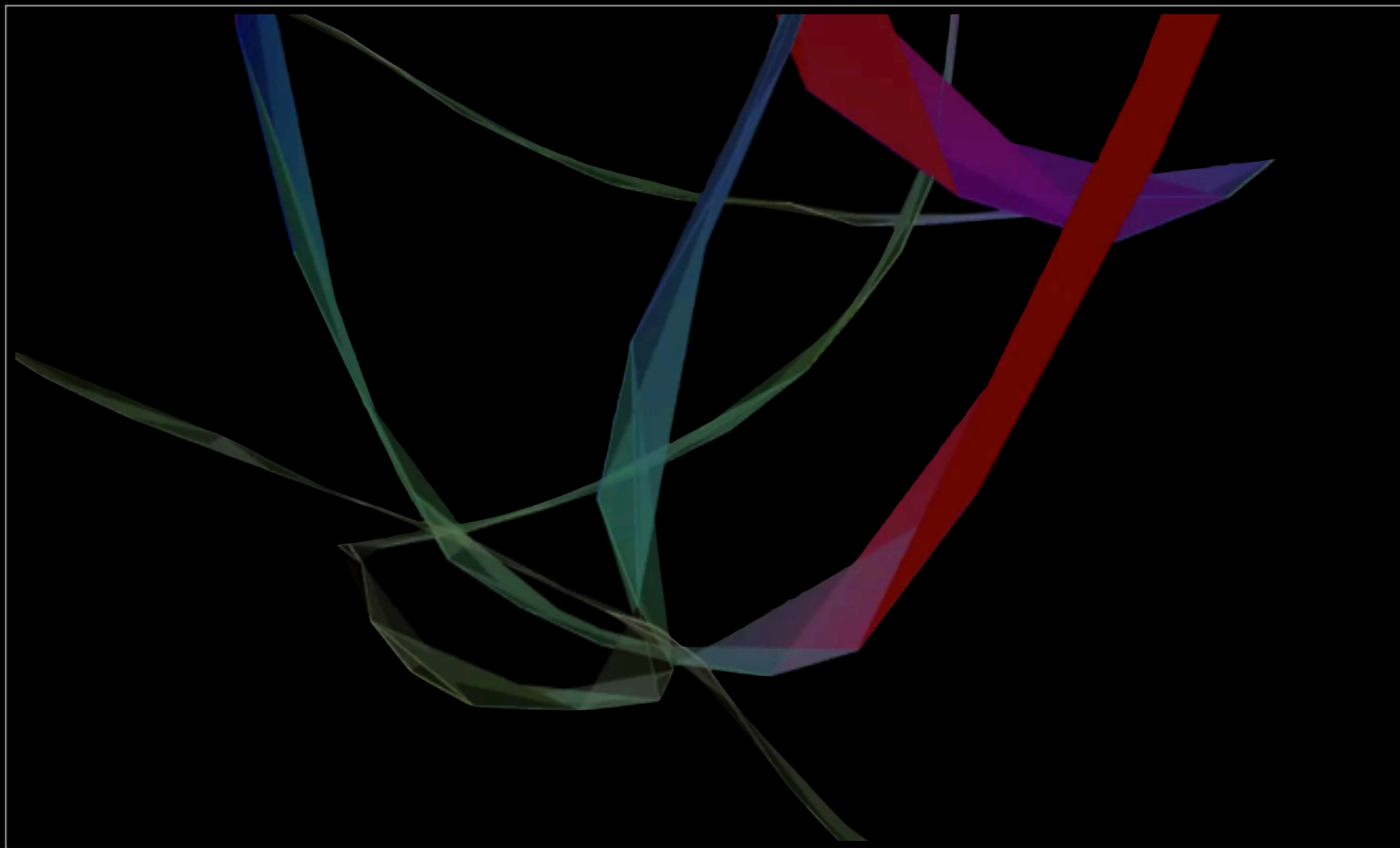# Welcome to Gesture

An exploration of 2D and 3D gesture recognition

Ben Alun-Jones

What is Gesture?

- Gesture is a three-dimensional realtime visualisation

- Gesture is a collaborative environment

- Gesture is human motion

What is a gesture?

- A non-verbal signal that relates information through motion or expression.
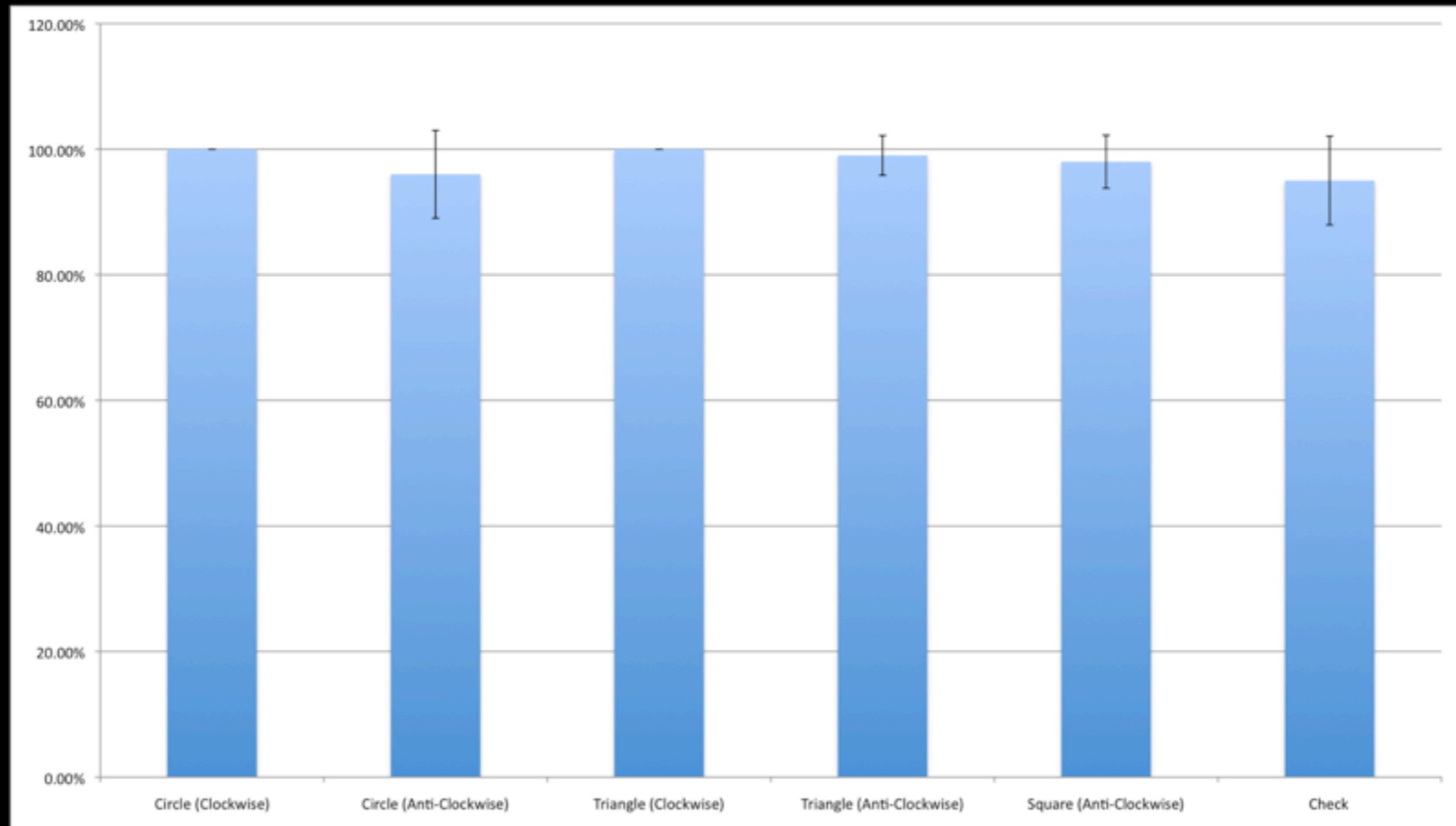
How do you recognise gestures?

- Machine Learning

- Template Matching

  - "$1 recognizer"

  - "$3 recognizer"

Selecting gestures

- Templates mean that almost any gesture can be recognised

- But gestures denote meaning, so which ones to choose?

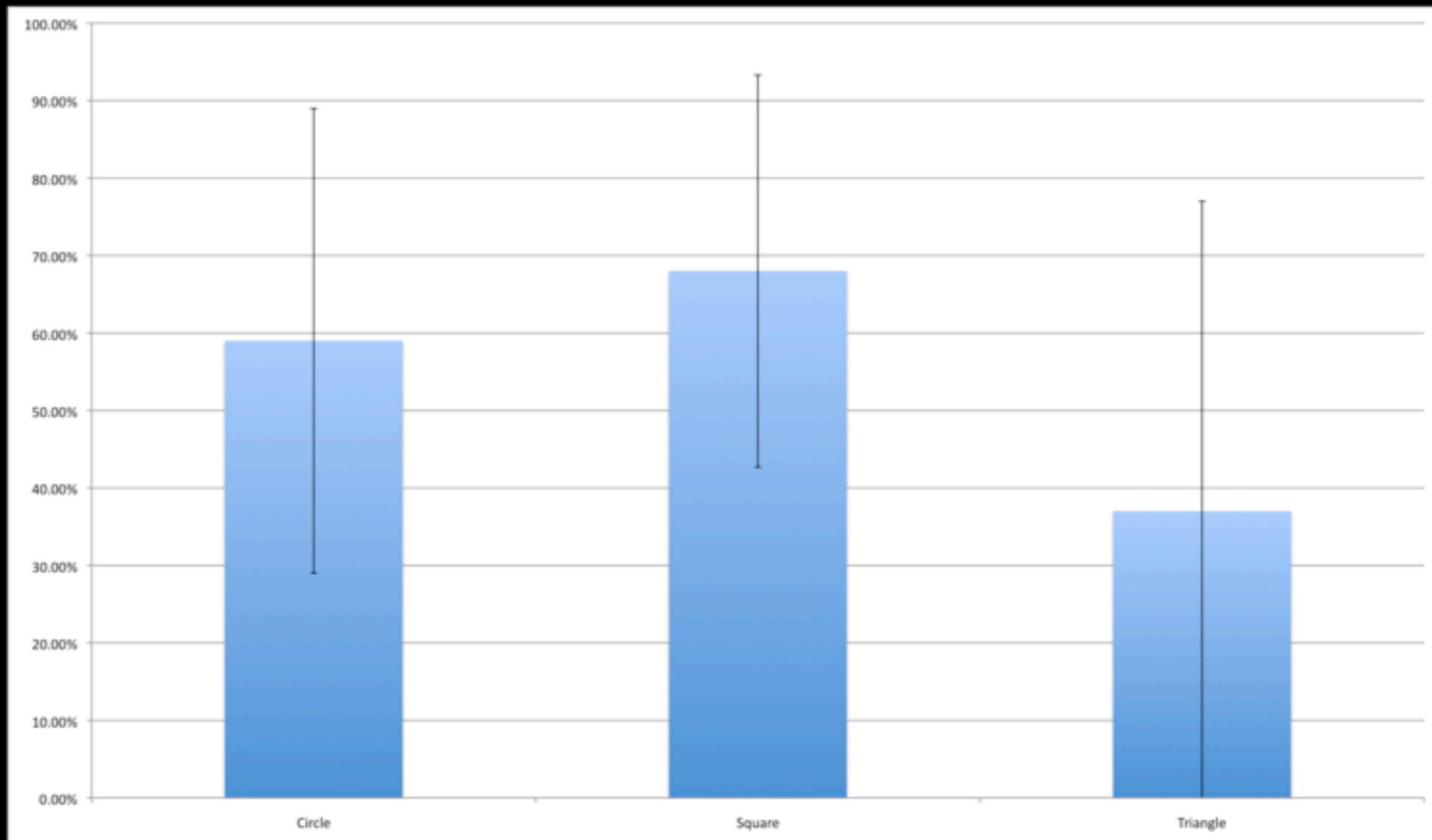   - Even geometric shapes present challenges
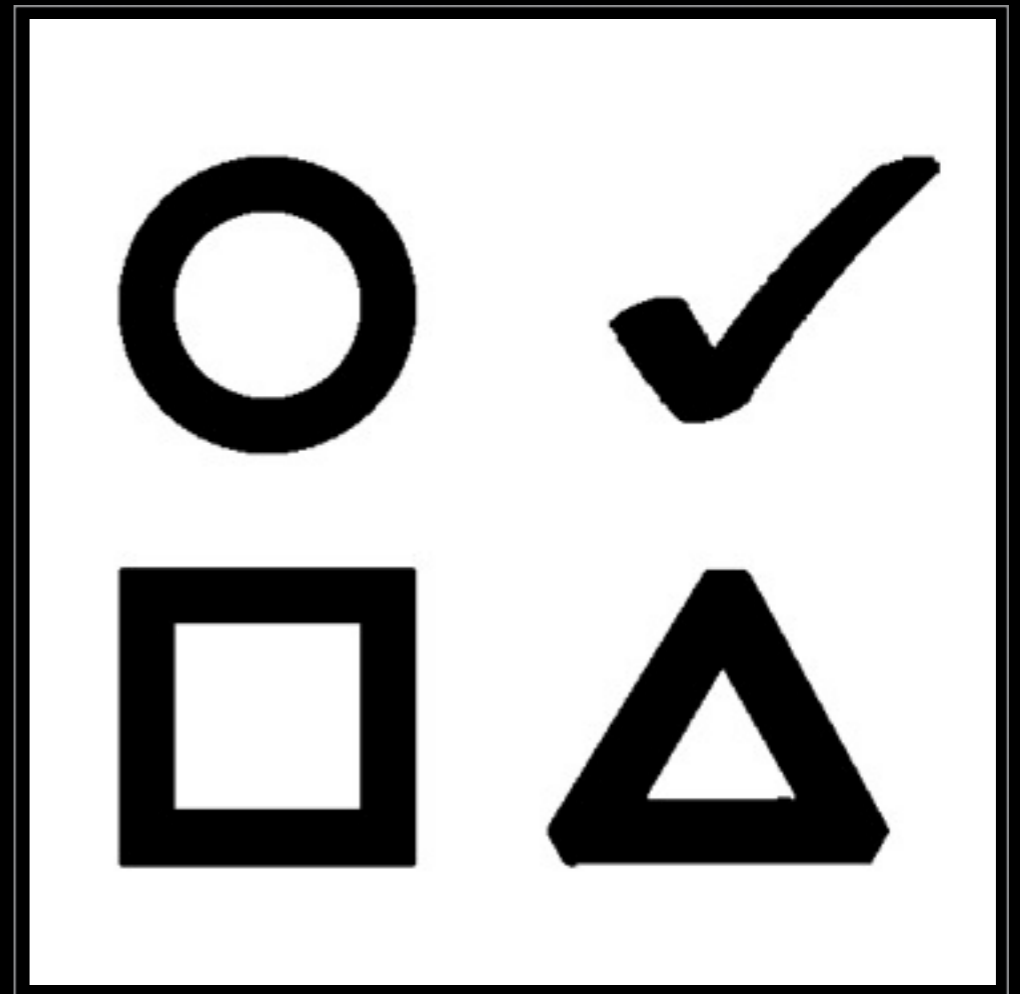
Results of gesture recognition methods "in the wild"

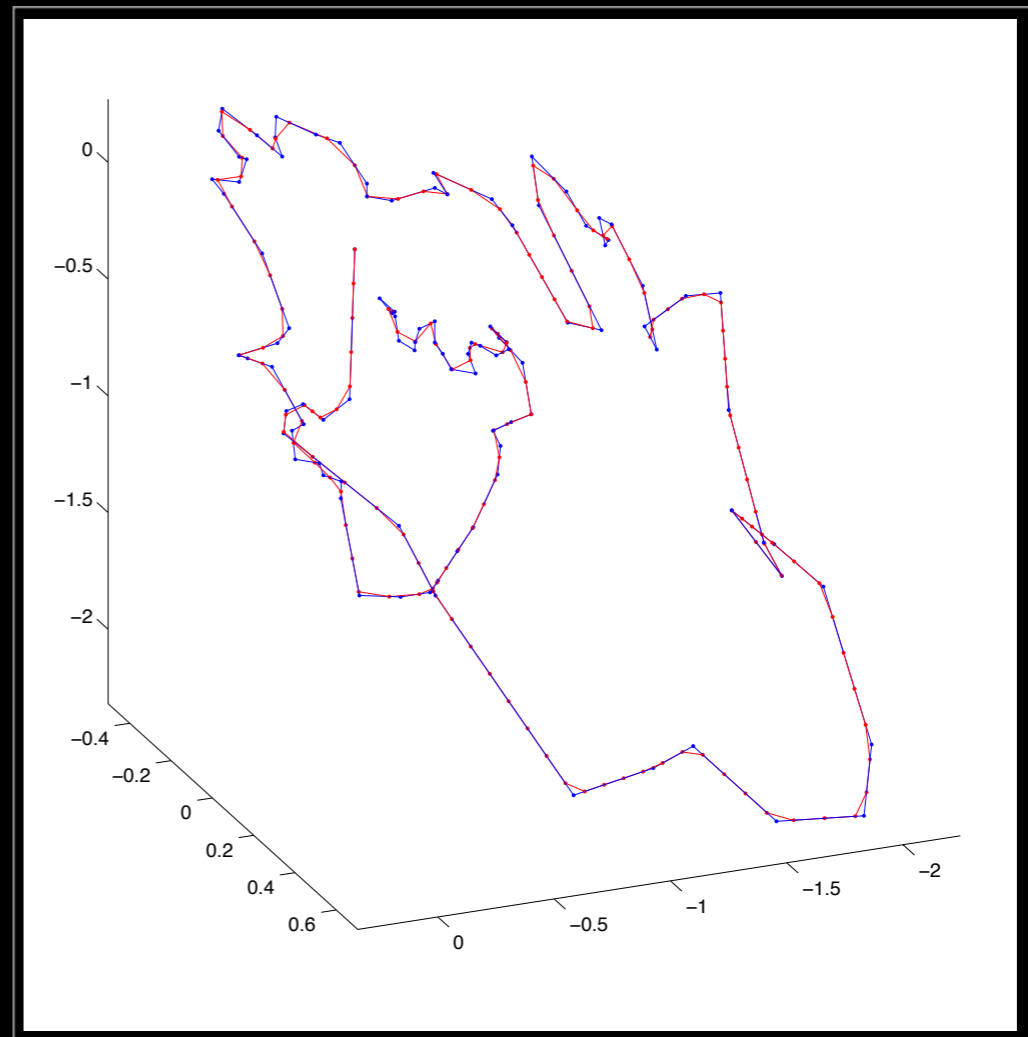$1 Recognizer - Recognising gestures on the touchscreen

Results of gesture recognition methods "in the wild"

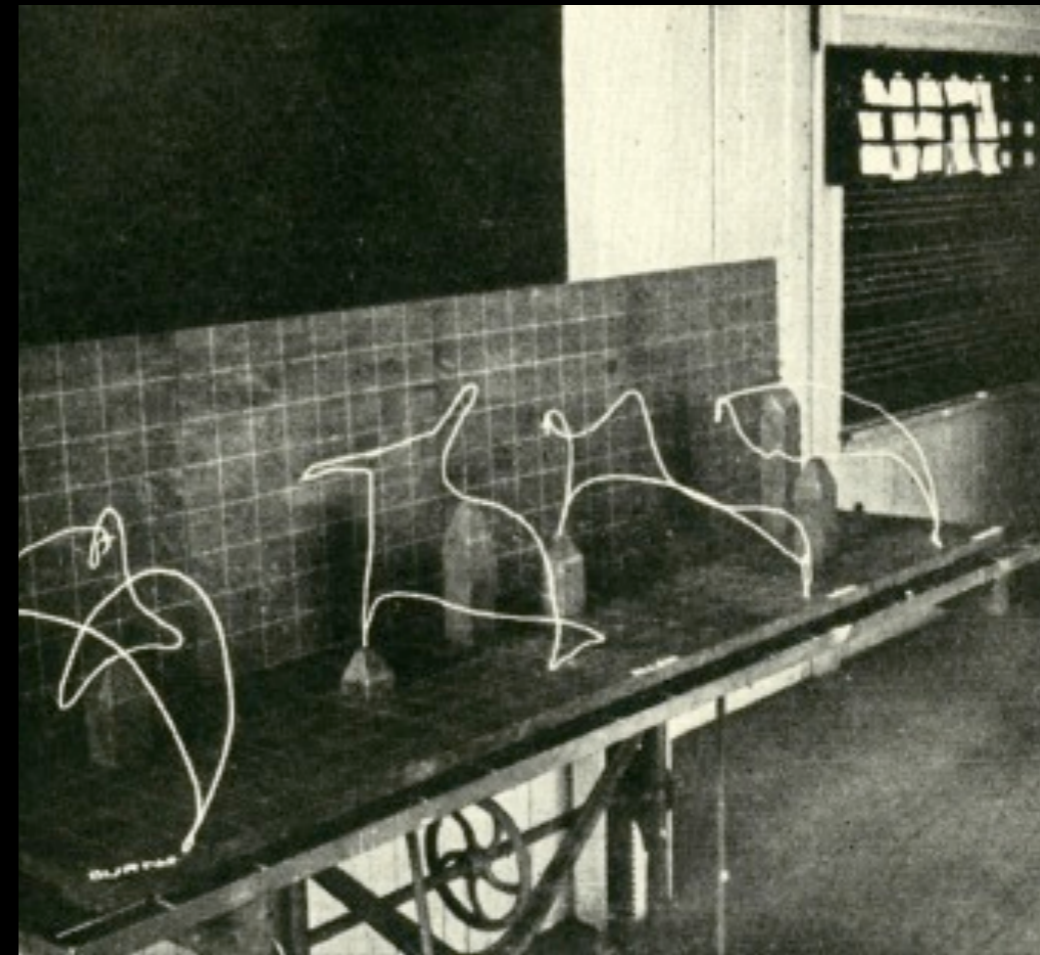$3 Recognizer - recognising gestures using the accelerometer
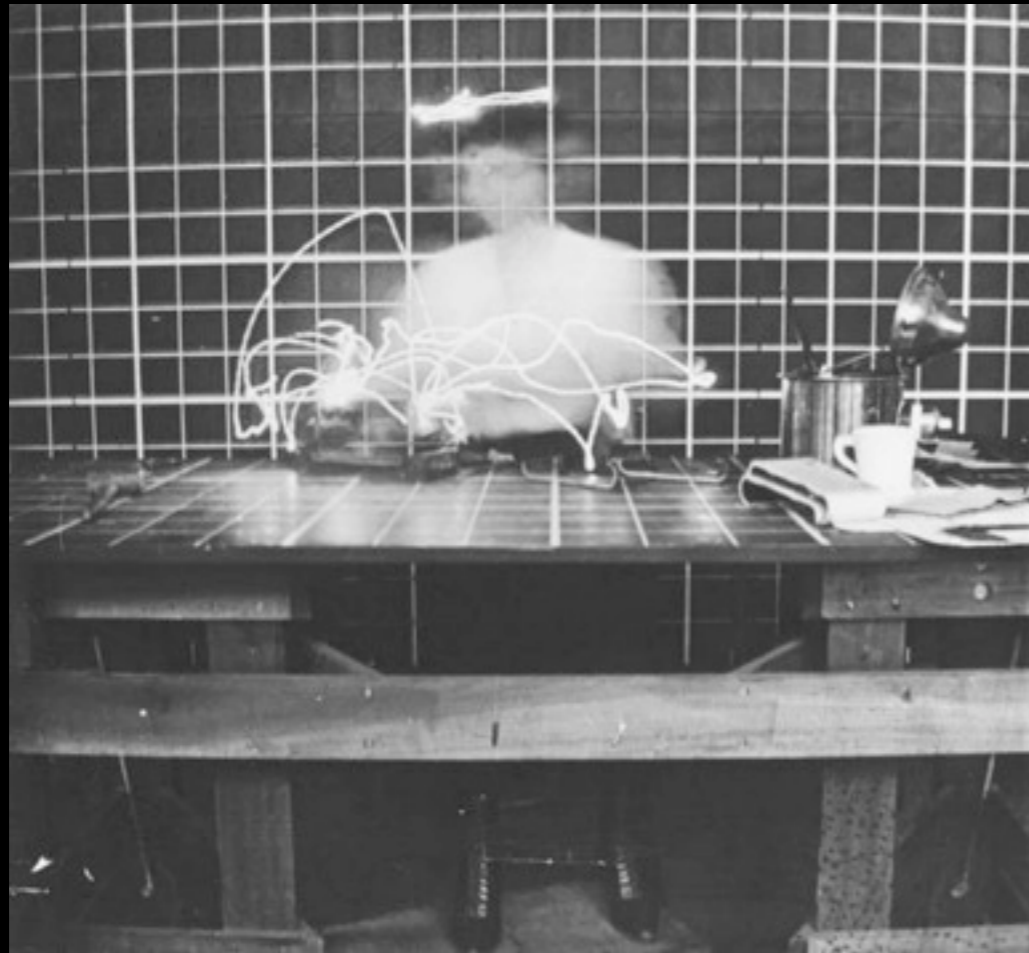
What do gestures look like?

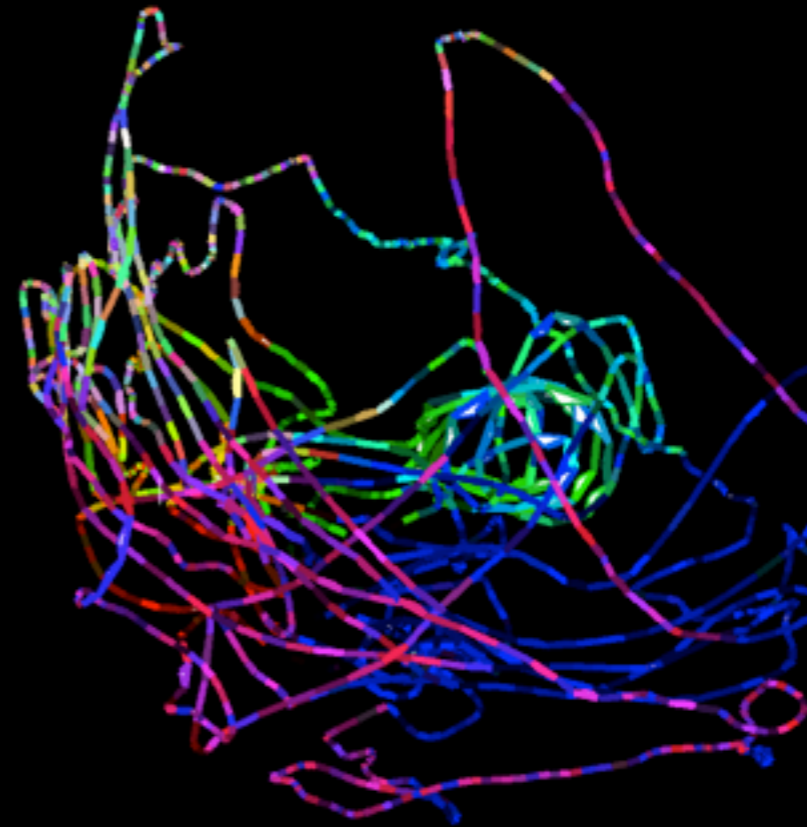- iPhone accelerometer data of a circle gesture

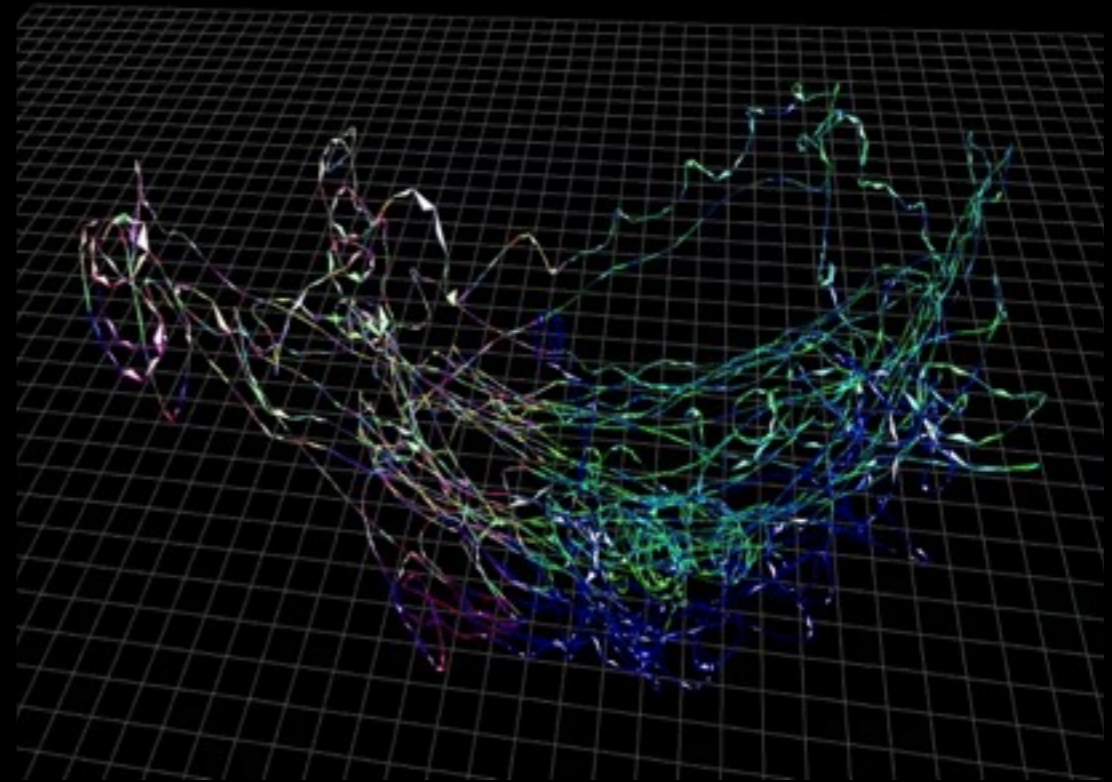# Time and Motion Studies

Frank and Lilian Gilbreth

Early Attempts

- Difficult to perceive depth

- Colours did not relate as hoped

Improvements

- Added grid to provide depth cues

- Changed line structure to represent acceleration
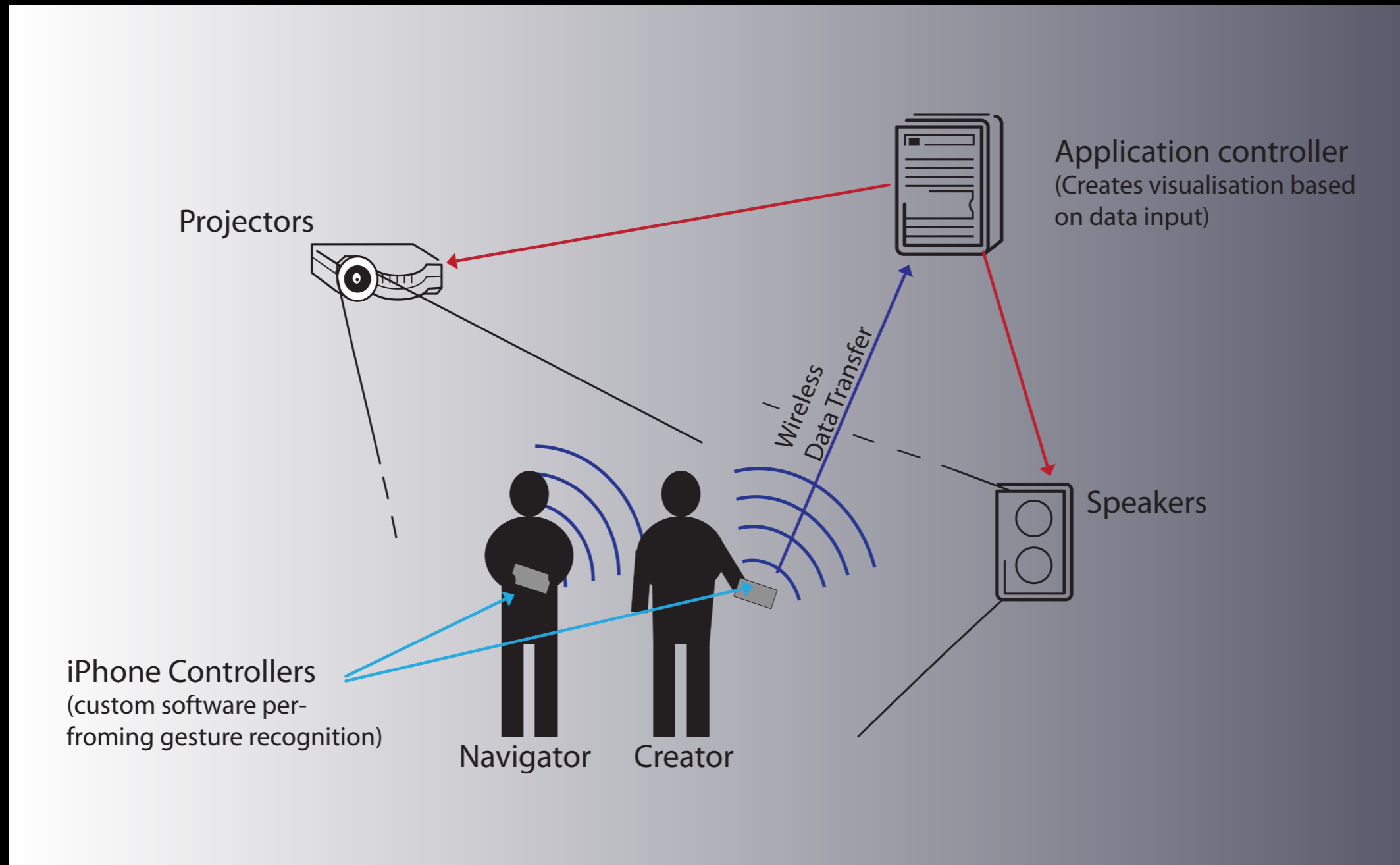
Now

- Style now related to motion

  - Thickness, colours and sound

- Helped by work in 594CM

Constructing Gesture

Projectors

Application controller
(Creates visualisation based
on data input)

Wireless
Data Transfer

Speakers

iPhone Controllers
(custom software per-
froming gesture recognition)

Navigator   Creator
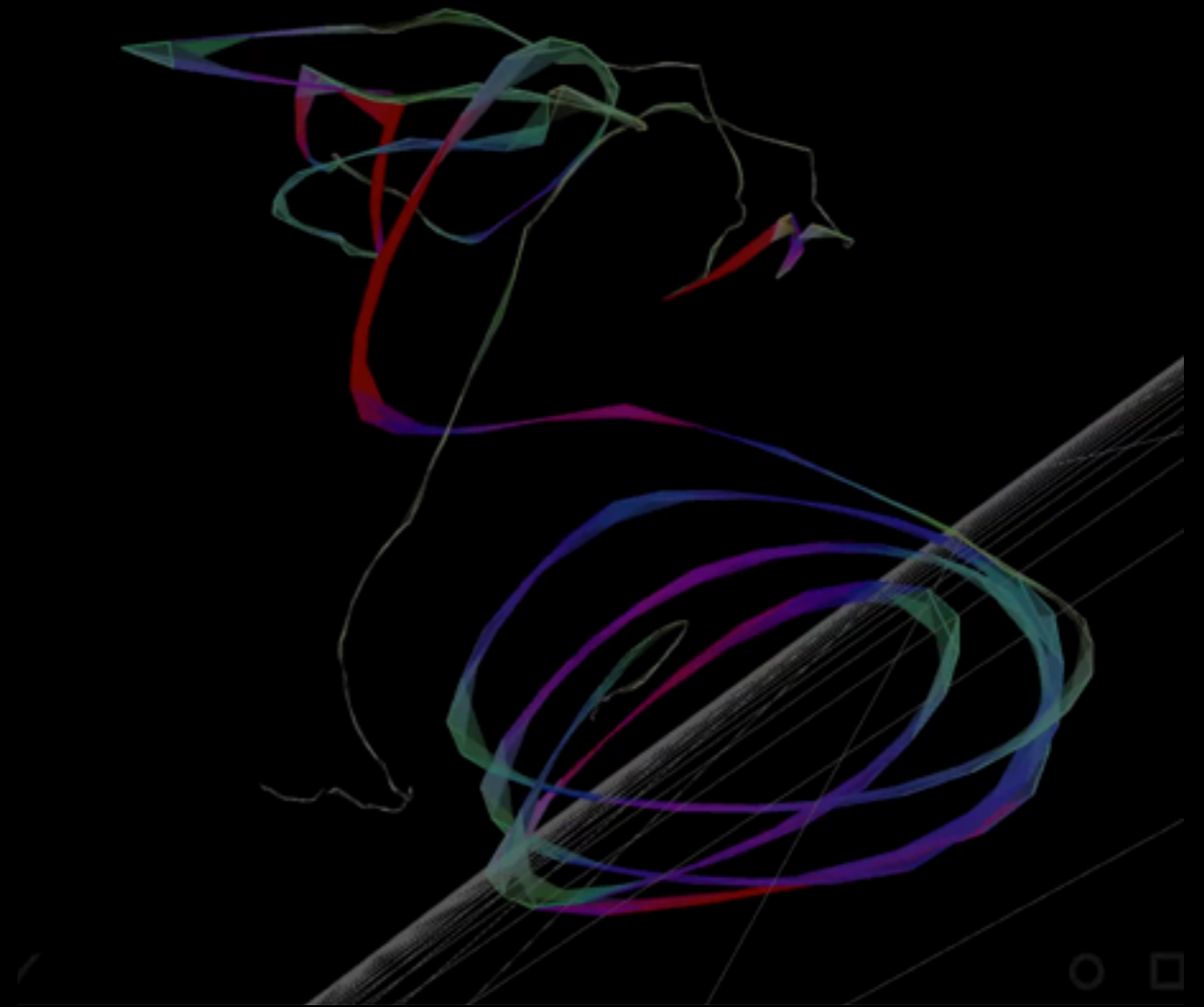
Constructing Gesture

- Visualisation built in Processing

    - Realtime content creation and manipulation

- Two custom iPhone Applications written in Objective-C

    - Performs 2D and 3D gesture recognition

Multiple users

- By separating roles of navigation and drawing, *Gesture* becomes more engaging, more fun
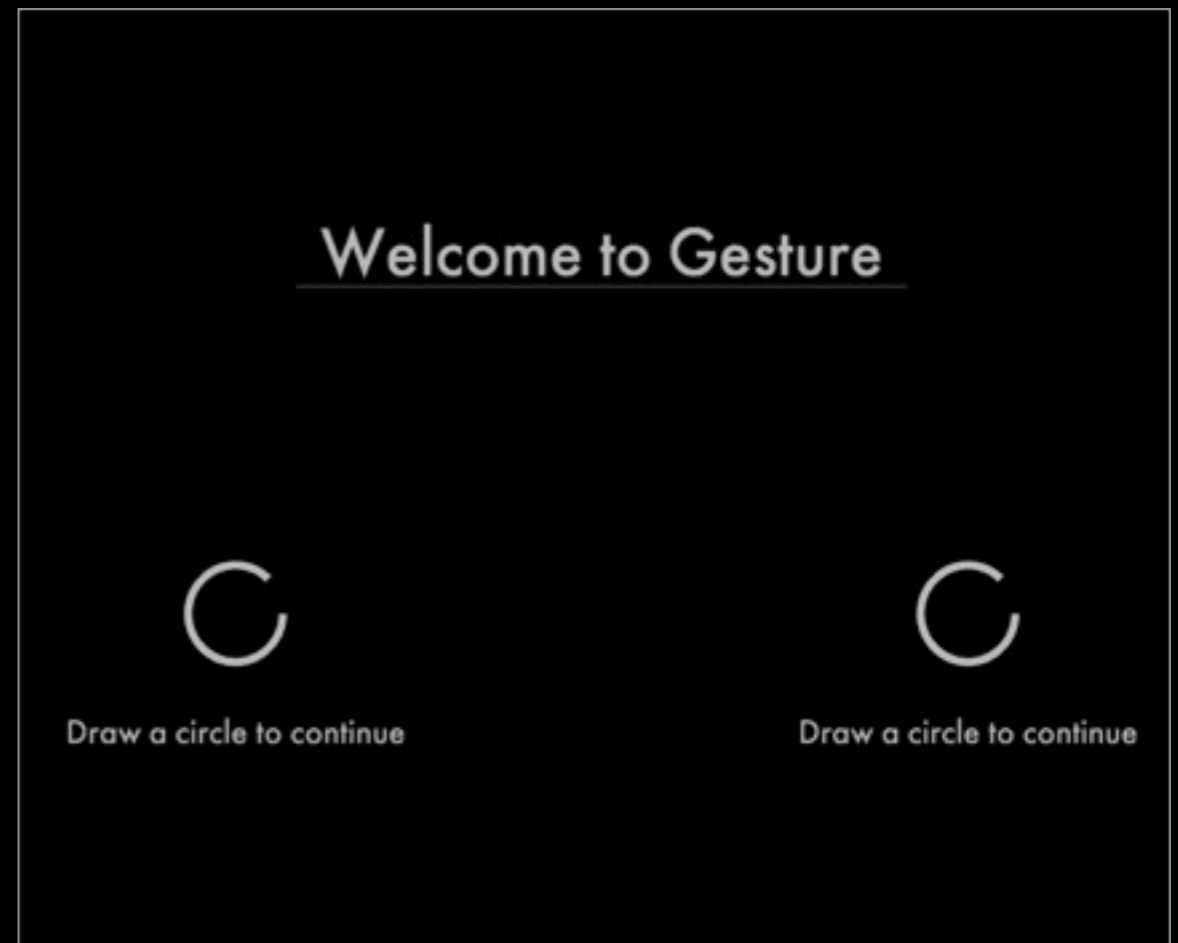
 Draw   Navigate

- One iPhone draws the scene and controls the style

- One controls the camera - rotation, pan and zoom

Providing instructions

- Visual clues were used (and should have been used more) to influence the user

  - Several people were seen attempting to draw on the wall

Welcome to Gesture

Draw a circle to continue

Draw a circle to continue

Demonstration

Conclusion

- *Gesture* highlights the potential of mobile devices to control of large scale visualisations

- Gesturing is a more natural, fun interaction style

- As the world become more mobile, we need a new interaction paradigm

  - Could *Gesture* point to it?