

# gestur.a Project Journal

*the gestural synthesiser you always have on you*

gestur.a  
gestural synthesiser



- built on open source sound synthesis engine
- gestures based on machine learning
- intuitive user-centred design



Candidate Number: 196484

Module Code: 871P4

Academic Year: Spring 2019

# Feb 5th

## **Ideas - Augmented Realit**

Historical locations

- Visualisation and 3D sound worlds based in real locations, showing an overlay of how life was in a historical location - i.e. Arundel

Smart indicate

- Ultrasound directional sensors when indicating and changing lanes at speed in cars for blindspot car-detection and crash-mitigation

Floor directions

- Directions in public places towards points of interest, or in museums for different sections
- <https://www.studio05.nl/wondermentlab/augmented-reality-wayfinding-concept-for-lego-denmark>

## **Ideas - Musical Instruments**

Park climbing frame

- Utilise existing environment / play interactions
- Augmentation of playful interaction into creative expression
- Children enjoying outdoors more - digital health
- Arduino with Max MSP / Pd

Smartphone instrument

- Gesture based instrument
- Uses machine learning to learn gestures more accurately
- User tested for more intuitive sound design
- Uses libPD to allow open source sound engine Pd implementation on smartphones.

# Feb 12th

Park climbing frame moodboard:

sound and acoustics  
design and architecture

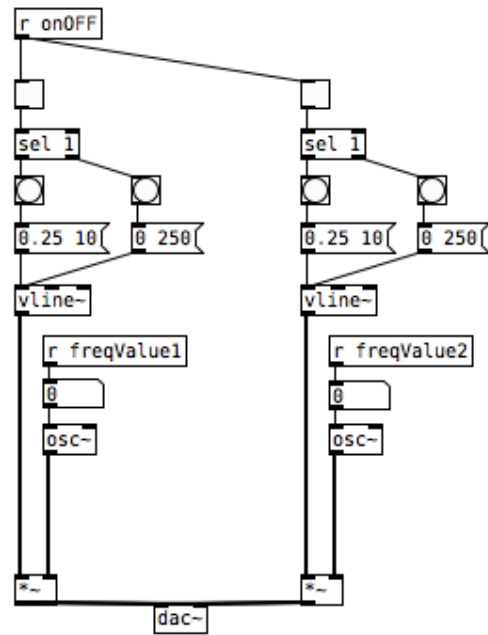
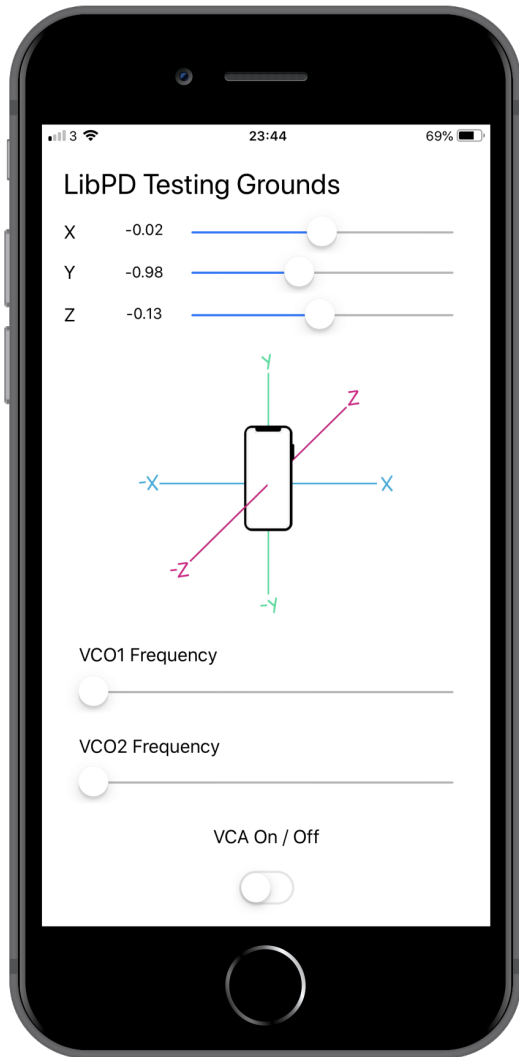


creativity  
expression  
collaboration

Presented to the class on the augmented climbing frame. Good responses, colourful pitch. Focus on a on stakeholder map. Try physical prototyping.

# Mar 12th

Testing feasibility of smartphone instrument app idea. Current prototype shown, as well the simple Pd patch that it uses (two oscillators):



The app allows the oscillators to be modulated by shaking the phone. Accelerometer data is shown as sliders at the top. I used libPd (code framework) to make this app.



# Mar 19th

I completed some questions about the app

**Who are the first test users you are working with in the development of your project?**

Graduate and undergraduate students studying Music, Music Technology, and Design.

**How are you contacting them?**

Mailing lists, through class, lecturers and academic advisor.

**Do these users differ from the "actual" users of your project?**

Yes, in that they are all of a certain demographic - student. But they would fit as actual users too.

**Engagement process with testers**

Three iteration phases, each taking on feedback through videoing and codifying responses using grounded theory from each user. Recording user gestures for machine learning training

**Tag line**

gestur.a - the gestural sound synthesiser you always have on you.

**Brief description**

gestur.a is a mobile instrument for creating new and interesting sounds. Due to it being a phone app, users can create music wherever they are, and in an intuitive way that makes use of machine learning to track gesture.

**Potential funders**

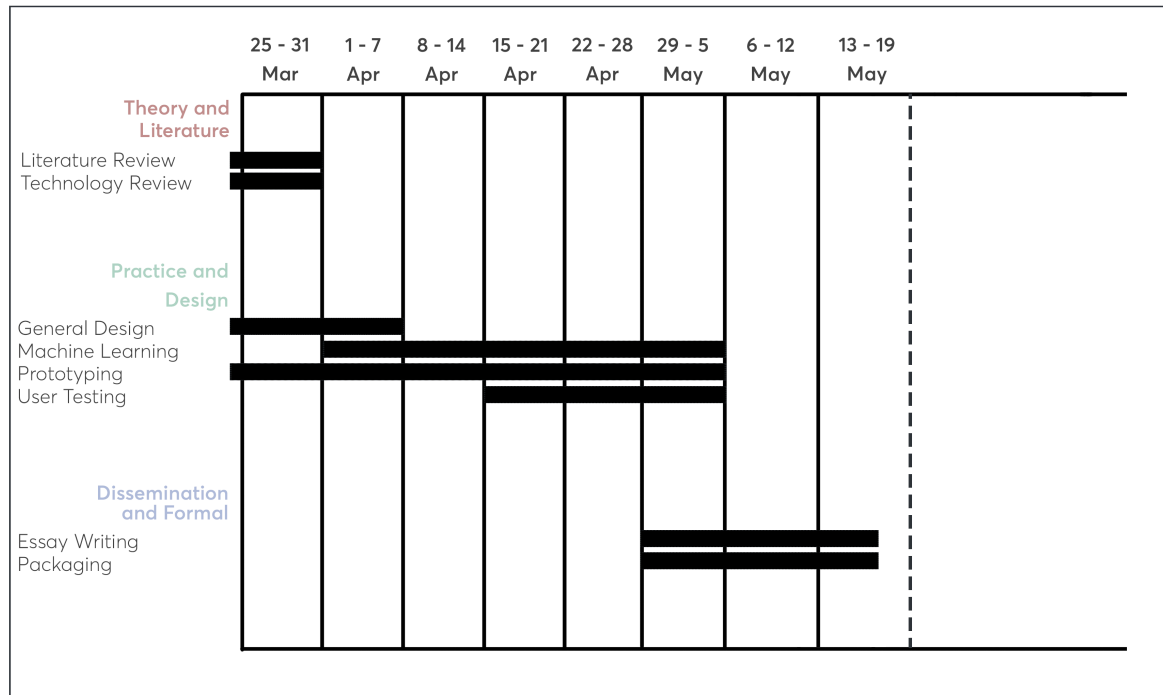
<https://www.brightec.co.uk>

<https://agileapp.co/>

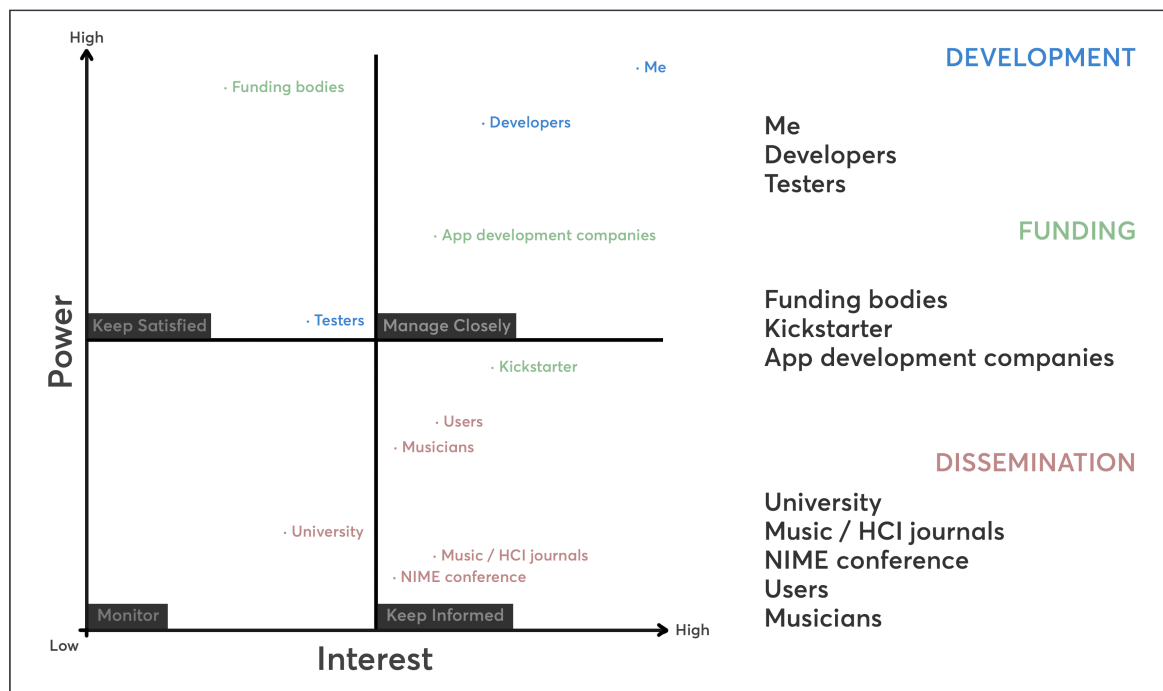
# March 27th

Completed a Gantt chart project schedule and stakeholder map for gestur.a

gest.ura Gantt chart



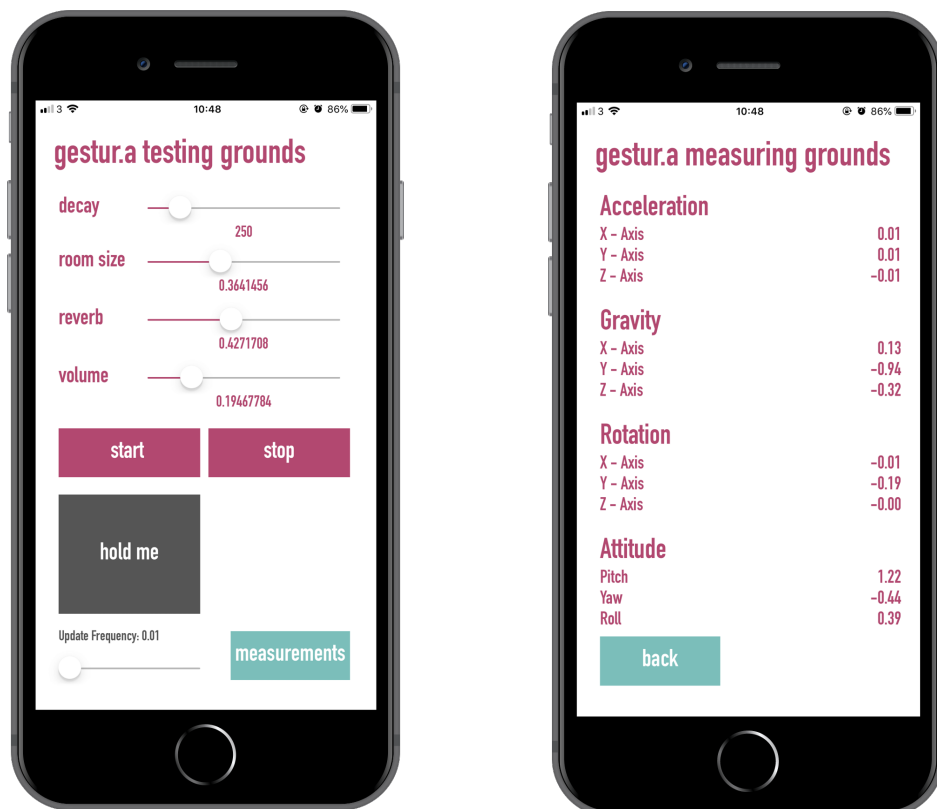
gest.ura Stakeholder Map



# Apr 3rd

Working on ML code for gesture recognition and training. It seems like machine learning is definitely a step in the right direction, but is too difficult to get working in the prototype given my time restraints.

Been working on the user-testing GUI in Xcode, so that my user tests can be logged correctly and I can gather the data I need from them. The patch now contains reverb as well, making the sounds less harsh to listen to and more interesting to interact with - giving the a number of screen-based parameters to control.



# Apr 9th

Had a presentation today where I demonstrated my prototype to the class - had some great feedback about the composition sharing / dissemination system I had thought of to pair with the release of gestur.a.

the system would be similar to

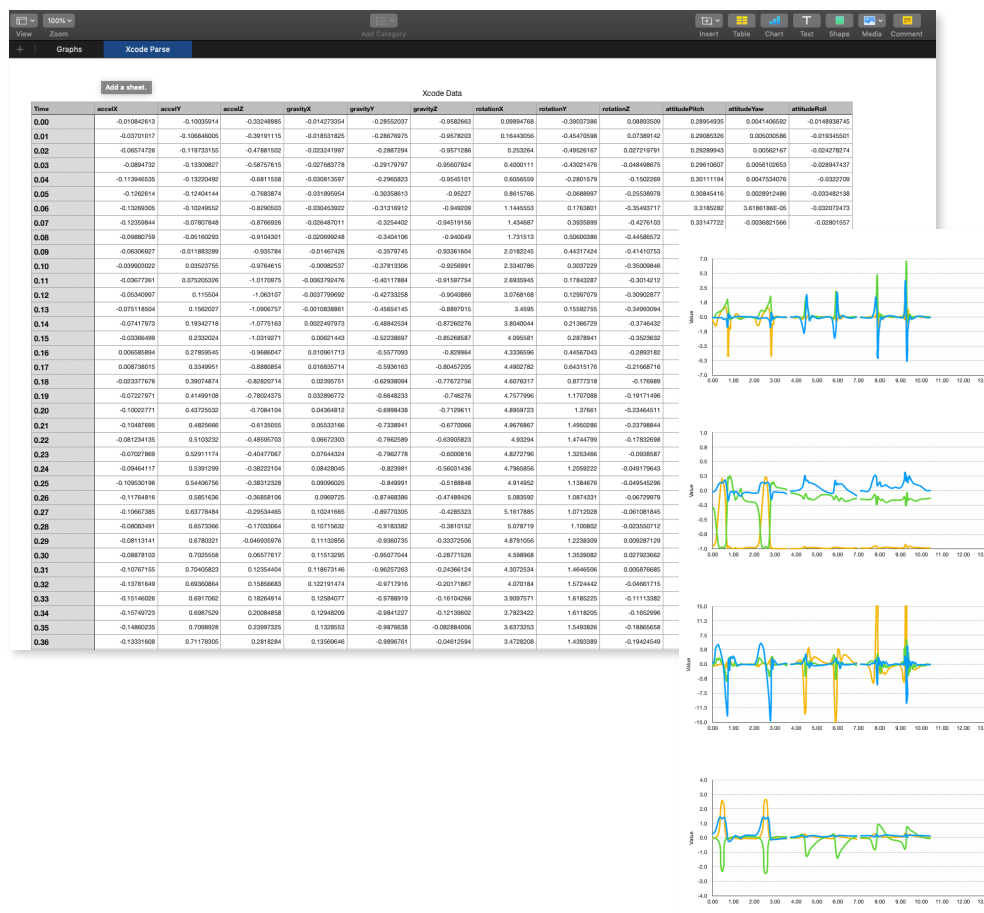
@sc140tweets - a bot that retweets #sc140 tagged code to make snippets of SuperCollider code easily found by other sound artists/programmers but can only be 140 characters long, which forces creativity through limitation.

@sc140bot - a bot that is connected to a Raspberry Pi SuperCollider server and regurgitates tweeted code as audio

The system would be an video infographic of your composition as a real-time 3D graph of your accelerometer data, as well as a front facing camera view of you creating the music through gesture (probably blurry and somewhat comedic) accompanied by the music itself. The result would be a short clip with an overlay of your composition described/realised as a 3D chart (graphical notation). The data could be reverse engineered to create the audio in theory.

# Apr 17th

Have changed the hierarchy of my PureData patch to make it more concise and easier to interface with LibPd in Xcode which will cut down on development time. I have also been working on graphing sensor data from user-tests to make the data more visually understandable in order to find trends in user preferences to sensitivity in gestures.



When the user holds down the measure button while making a gesture, the sensor data is printed to the development console from which I can paste it into an empty chart after the user test is over, which automatically makes graphs for each sensor.

# Apr 28th

Did three user tests this week. Started analysing the results using grounded theory in Nvivo 12 for a later paper. Found three areas when doing line-by-line coding -> aesthetics // materiality // feedback systems.

Some changes to the gestur.a system since the user-tests this week:

UI —

categorised sliders

removed arbitrary numbers

centralised the capture motion button

Pd —

added second oscillator (sounds richer now)

increased possible note decay to 60 seconds (can make longer sounds)

added a filter

assigned filter cut off sweep to iPhone roll gesture

System feels a lot more interactive now



# May 2nd

Engagement with Moggridge's hierarchy of design disciplines

**Anthropometrics:** *The sizes of people, for the design of physical objects.*

The gestur.a UI will be built for multiple iPhone models, meaning that it will not be constrained to a certain size of phone.

**Physiology:** *The way the body works, for the design of physical man-machine systems.*

Gestures will have been tested by users in the development stage and will be intuitive and comfortable. Funded development could take the development of gestur.a towards wearable technologies, meaning that the user could engage with the system hands-free.

**Psychology:** *The way the mind works, for the design of human-computer interactions.*

Consideration will be taken for the psychology of the interactions in the app. Sliders and buttons will be kept to a minimum for the most part. Leading to more expression and less confusion about the inner workings of the system.

**Sociology:** *The way people relate to one another, for the design of connected systems.*

User tests will be employed at the funded stage of development to explore the enjoyability and intuitiveness of a composition sharing platform, and options to export to other social media platforms.

**(Digital) Ecology:** *The interdependence of living digital things for sustainable design.*

Due to the software being built on LibPD and PureData, which are an open source framework and open source synthesis engine respectively, the sustainability of the app is more ensured. Once gestur.a is released it will be able to be used indefinitely. Any updates I release do not depend on the co-operation or even existence of developers LibPD/PureData due to them being open source. During funded development I will create a version for Android.