

CASE STUDY BOOK

Mathura Govindarajan

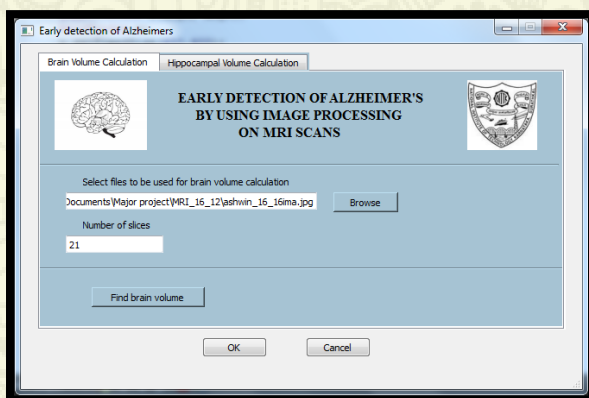
Logo Design



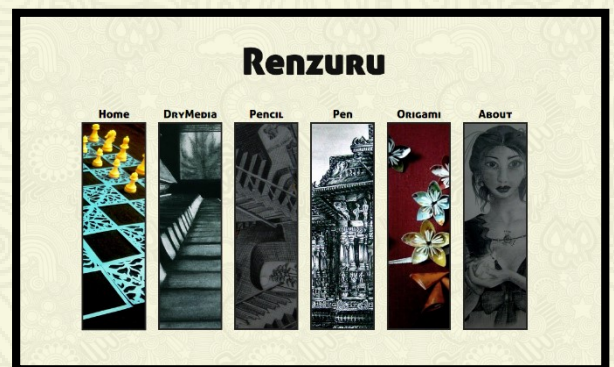
Claymation



Medical software



Webpage design



RACHANA – LOGO DESIGN

June 2011

Design logo for the production unit of Seva-in-Action, an NGO operating out of Bangalore, Karnataka

In collaboration with Seva in Action (NGO) -- <http://sevainaction.org/>

RACHANA – LOGO DESIGN

Design logo for the production unit of Seva-in-Action, an NGO operating out of Bangalore, Karnataka.

Who are the customers?

Seva-In-Action was started 29 years ago with an aim to minimize the gap that exists between the needs and provisions required for people with disabilities. Their main goal is to provide comprehensive & holistic rehabilitation services for all disabled people in rural areas. One of their units (**Rachana**) focuses on skill development and furthermore functions as a production unit.

What was the requirement?

Rachana has 25-30 adults with disabilities presently engaged in different types of skill work such as making paper bags, weaving foot mats and making terracotta pots. The paper bags made were sent over to various organisations and countries and needed a logo on them which represented the cause. This included the caveat that the logo had to be made a stencil so that it could be used easily by everyone working in this unit.

The design process

The initial idea was to create a logo for Rachana that was in sync with the logo of the entire organisation.

Prototype #1



The logo of the NGO



Prototype for the unit **Rachana**

Analysis of Prototype 1

- Prototype in sync with the NGO logo
- Shows how aim of the unit is to not only support but also enable the adults with disabilities.
- Symbolised little of the culture of the people working in this organisation
- Not easy to make a stencil due to the fine lines

The subsequent idea was to create a logo based on the letter “R” in Kannada (The native language in Bangalore, Karnataka) and continue to symbolise the rehabilitation promised in **Rachana**,

Prototype #2



Letter "R" in Kannada



Prototype for the unit Rachana

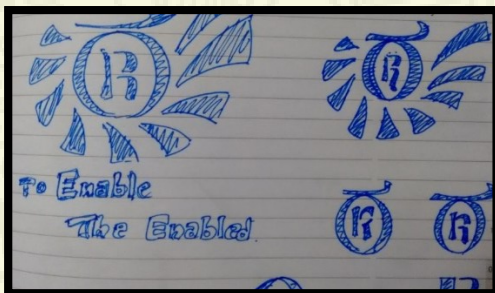
Analysis of Prototype 2

- Represented the culture of Bangalore, Karnataka where the NGO is located
- The outward and extending strokes symbolised the hope and development offered.
- Easy to make a stencil of this design
- Not in sync with the logo of the organisation
- Not relevant outside of Karnataka due to lingual differences

Feedback from the organisation on the prototypes

Preferred prototype 2 but wanted to add the letter "R" in English in the logo to increase relevance outside Karnataka and India. They confirmed that they did not expect the logo to be in sync with the entire NGO.

Modified prototype #2 based on feedback



Rough sketches based on the feedback

Logo sent back to organisation



Logo implemented in Rachana!



Rachana then took the modified prototype, created a stencil and implemented it on the paper bags produced from the unit!

CLAYMATION VIDEO

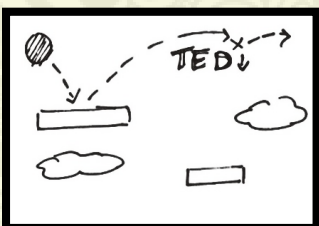
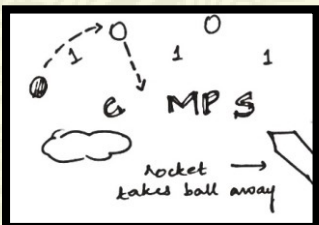
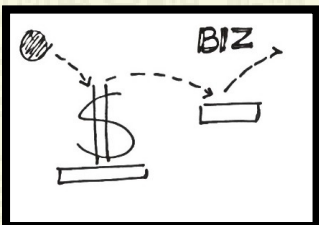
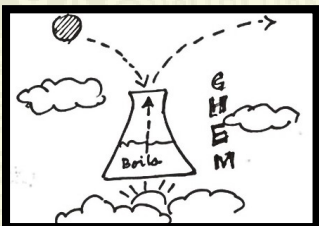
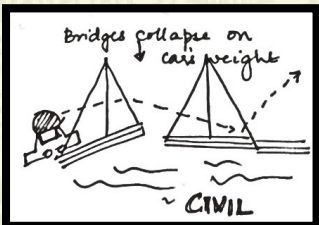
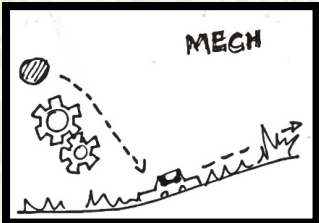
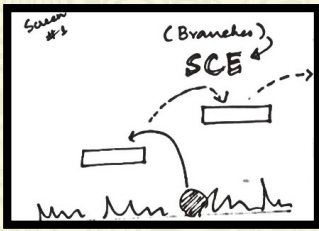
OCTOBER 2011

*Promotional video for Engineer, 2011 – Technical fest of National Institute of Technology
Karnataka, India. <https://www.youtube.com/watch?v=k9pq0O1cQdA>*

In collaboration with students from NITK - www.nitk.ac.in

STORY BOARD

START



CLAYMATION VIDEO

Promotional video for Engineer, 2011 – Technical fest of National Institute of Technology Karnataka, India.

WHAT IS ENGINEER AND NITK?

- NITK – National Institute of Technology, Karnataka is one of the top 10 engineering schools in India. It has students from all over the country as well international students.
- Engineer - Annual Technical Symposium of NITK and is one of the largest of its kind in India.
- It has a participation pool of over 6000 students from 150 colleges across 65 countries.
- Started in 2005, has the motto – **Think. Create. Engineer.**



VIDEO REQUIREMENTS

- Cover all the event categories in the fest
- Less than 90 seconds in length
- Bring forth the creative aspect of the fest

RESOURCES

- 6 membered team (including 2 members who exclusively worked on sound, video mixing and editing)
- 48 hours to go from concept to completion

EVENTS TO COVER

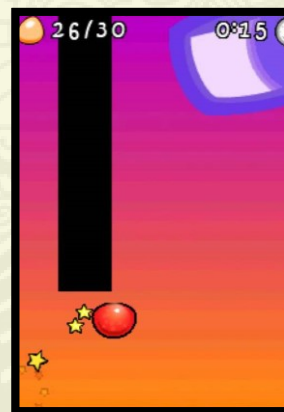
- | | | |
|--|------------------------------|----------------------|
| - Socially conscious engineering (SCE) | - Chemical Events | - Night-time Gaming |
| - Mechanical Events | - TEDx – Inspirational talks | - Astro Events |
| - Civil events | - Business Events | - Electronics Events |
| | - Computers events | - Informal Events |

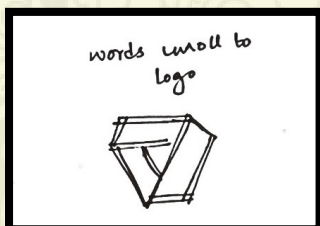
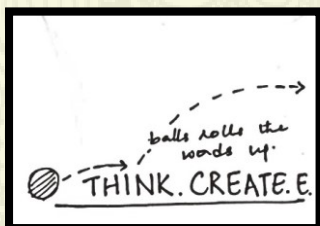
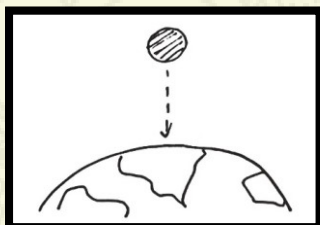
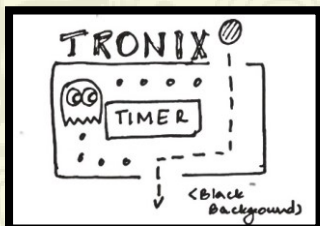
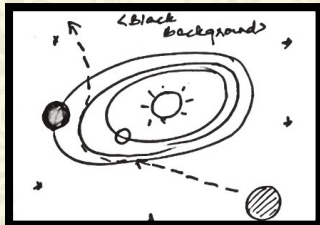
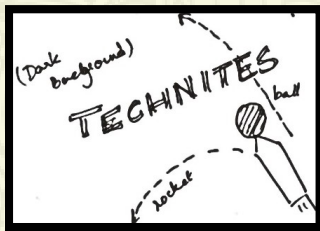
STORY LINE

- To actually cover all the events we needed a story line that would help in **easy transitions between scenes**
- We thus decided to model it behind the “bounce tales” game!



Not only was scene change a common feature of the game, it was also **famous in the college crowd** and thus very relatable.





FIN

Now, using **"the bounce tales"** as a reference, we began to story board the entire video covering the journey of the ball from one scene to the other.

Once that was done, we still needed to incorporate the fest logo in as that was the key aim. Thus we decided to **make one last entrance of the ball to help unravel the logo.**

Now the story board was complete, we **were left with once day to decide on the media and complete the video.**

MEDIA CONSIDERED –

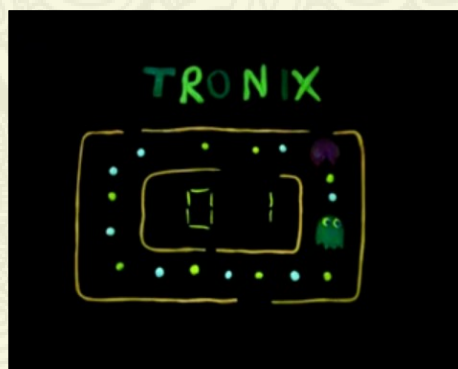
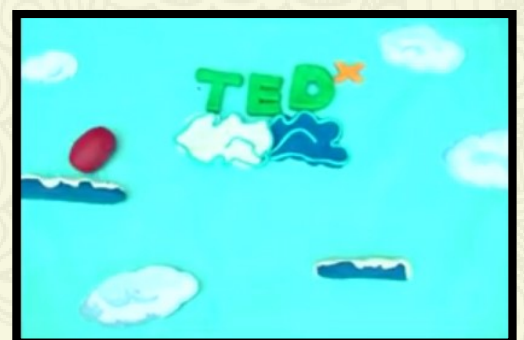
- 1) Chalk motion animation
Minimal resources required – chalk, blackboard
Less time required to actually draw
Lack of colour and vibrancy – very much unlike the game
- 2) Clay animation
Minimal resources required – coloured clay
Extremely vibrant and colourful
Less time required to make basic clay models
- 3) Shadow puppet videos
Minimal resources needed – paper and a white screen
Lack of colour and vibrancy – very much unlike the game
Takes increased time to create puppets for each scene

After looking at all the possibilities, **Clay animation was the clear winner.**

FINAL VIDEO –

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=K9PQ001CQDA](https://www.youtube.com/watch?v=K9PQ001CQDA)

The video was completed by taking **900 pictures** to create stop motion animation using the clay models.



EARLY DETECTION OF ALZHEIMERS DISEASE

October 2012 - May 2013

Locate early symptoms of Alzheimer's disease with the help of MRI Scans

In collaboration with students from **National Institute of Technology Karnataka** (Surathkal, India)
and radiologists at **Kasturiba Medical College** (Manipal, India)

EARLY DETECTION OF ALZHEIMERS DISEASE

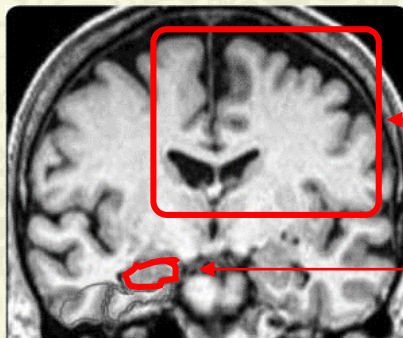
Locate early symptoms of Alzheimer's disease with the help of MRI Scans

What is Alzheimer's and its symptoms?

- An irreversible and progressive brain disease
- Gradually destroys memory and thinking skills to a critical extent
- Most common amongst older people (more than 65 Years, more common in women)

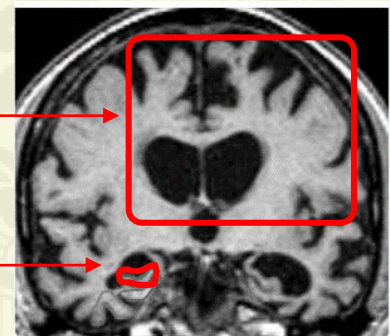
What changes take place in the brain?

- Atrophy of entorhinal cortex and hippocampus (medial temporal lobe) which is primarily responsible for long term memory.
- **General Atrophy** - An overall reduction in the size of the brain



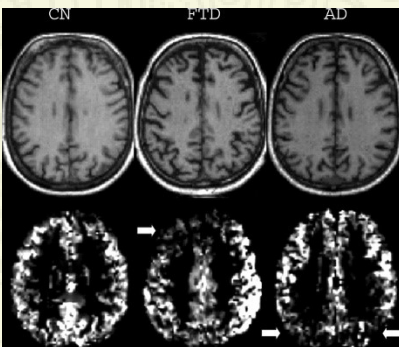
General brain atrophy

Reduction in hippocampal area

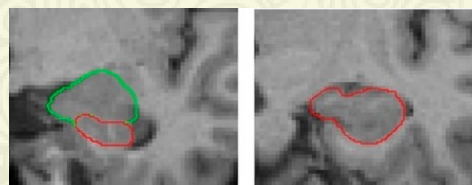


Current Methods used to diagnose at an early stage

Eyeballing of the MRI scans



Manual tracing of the hippocampus



Neuropsychological Evaluation

Table 2. Mean scores from neuropsychological evaluation in patients with refractory temporal lobe epilepsy

Neuropsychological Tests	Scores
Vocabulary	8.5
Block Design	11.52
Visual Reproduction (delayed recall)	28.1
Logical memory (delayed recall)	17.04
RAVLT	43.56
Trail Making Test A	54.28
Trail Making Test B	104.7
Stroop Test I	16.92
Stroop Test II	18.95
Stroop Test III	30.18

Our Aim

Develop a standardized model which can process the MRI scans of the patient and provide various parameters that indicate whether the patient might be prone to the disease

Goals

- Determination of **brain atrophy**
- Determination of **Hippocampal atrophy**
- Development of a **medical educational tool** and **diagnostic tool**

Requirements

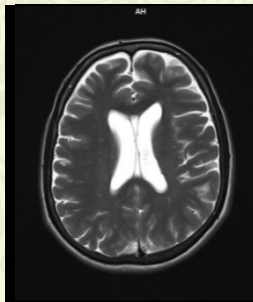
- 50-100 **MRI Scans**
- Assistance from **radiologists and neurologists**
- **Software** to develop algorithms and diagnostic tool.

Gathering the Requirements

#1 MRI Scans

- **Case inclusion criteria:** All cases referred to department of radio diagnosis above the age of 50 years with symptoms of memory loss
- **Case exclusion criteria:** Cases involving stroke, brain tumours, physical brain damage
- **Selecting the right MRI Scan:**

T1 MRI Scan

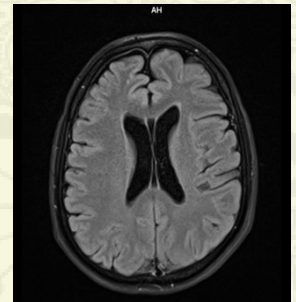


Black
Grey
White

CSF
Grey Matter
White Matter

White
Grey
Black

T2 MRI Scan



We selected the **T2 axial sections** due to the higher contrast between the grey and white matter.

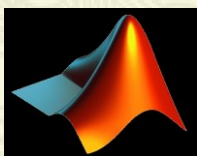
#2 Assistance from radiologists



We approached the radiologists at **Kasturiba Medical College** (Manipal, India) for a tie up with our group from **National Institute of Technology Karnataka** (Surathkal, India)



#3 Software selection



- **MATLAB®** - for developing the algorithms and trying new methodologies.

Has inbuilt methods which increases ease of prototyping

As there is a wrapper around the methods, they can't be optimised

- **OpenCV** – to optimise the selected algorithm
Open source software – easily available
Provides out of the box functionalities to allow interactive image selection



- **Qt** – for developing the front end for the end application
Open source software - easily available
Cross platform application framework

Brain volume calculation

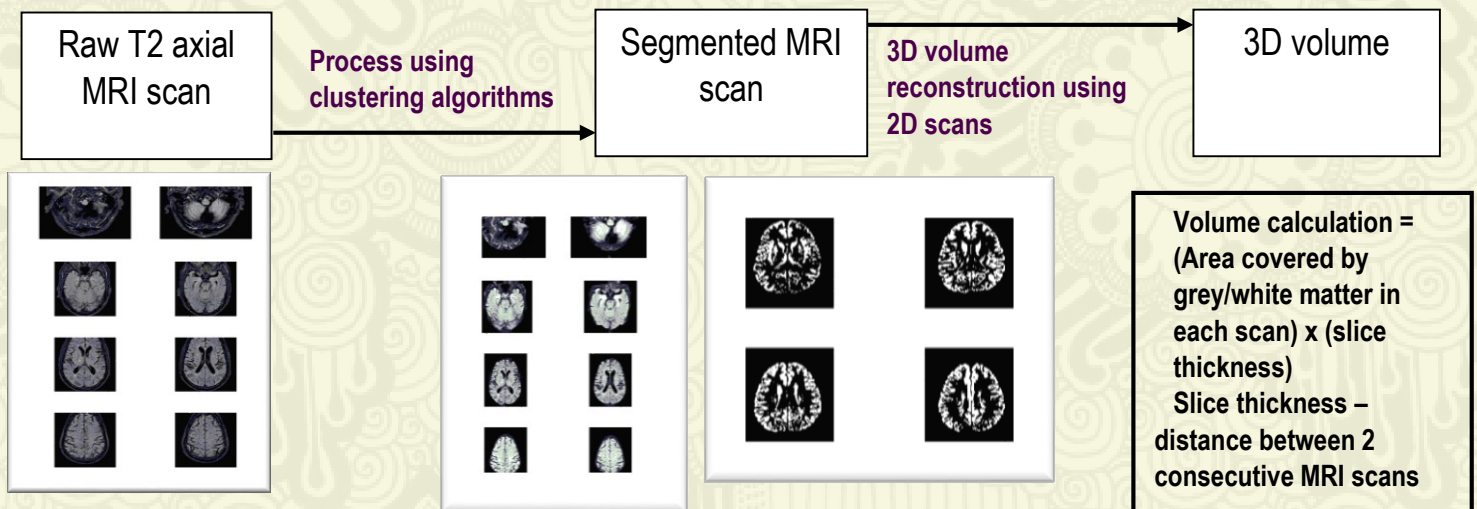
We now had T2 axial MRI scans (20 – 24 per patient) from which we needed to calculate the below data points using clustering algorithms.

- 1) **Grey matter** volume
- 2) **White matter** volume
- 3) **Total volume** (grey mater + white matter)

Selecting the clustering algorithm

- Hierarchical agglomerative clustering – **Highly complex and thus slow for large data sets**
- K-means clustering and quality measures – **Simple and unsupervised learning algorithm**

Based on the above pros and cons, **K-means was used for brain volume calculation.**



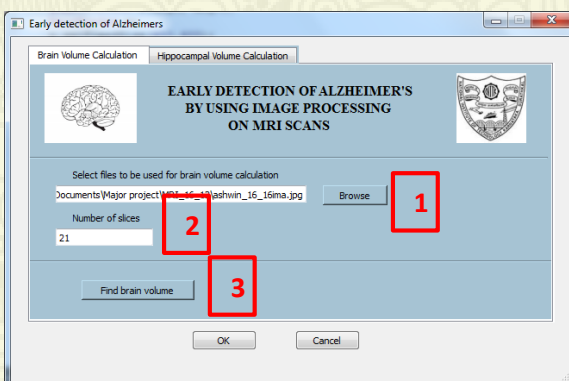
Software tool

Now we had to develop a tool so that the **doctors/students could feed the MRI scans to it and view only the results they needed.**

The back end calculation was unnecessary and thus hidden from them.

Tool developed

Front Screen

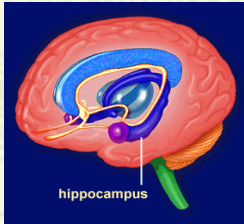


- 1) Enter the location of the MRI Scans
- 2) Enter the total number of available slices
- 3) Press the button for process to begin and to obtain the results shown below!

BRAIN VOLUME

```
Total Brain Volume : 1146.854000 cc
Total Gray Matter Volume : 533.589500 cc
Total White Matter Volume : 613.264500 cc
```


Hippocampal volume calculation

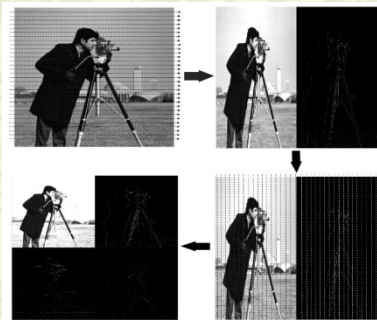


The hippocampus is long elongated structure which lies folded in the brain and is hard to locate and isolate.

To isolate the hippocampus, we had a look at the algorithms below-

Wavelet transform

This algorithm mainly traverses the image and marks any frequency change as a boundary.

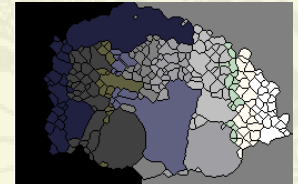


Result of wavelet transform

In MRI scans, change in frequency is subtle and the boundaries are not very well defined.

Watershed algorithm

It is widely used in medical analysis as it produces the complete division of an image.



Original Image

Result of the watershed algorithm

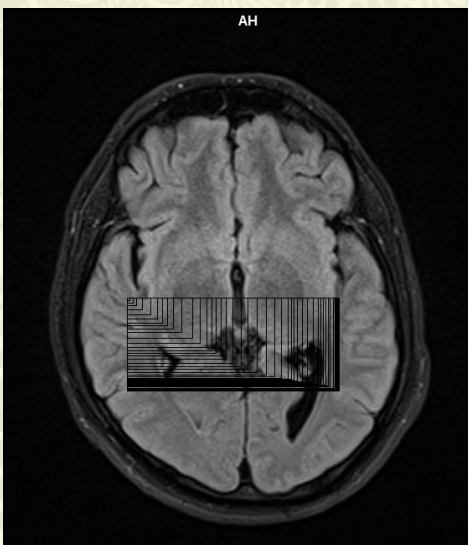
Due to high number of folds in the brain, the algorithms resulted in multiple boundaries which made the hippocampus isolation difficult.

The method that was devised to isolate the hippocampus was a combination of the above concepts which ensured that we obtain high contrast image with minimal noise

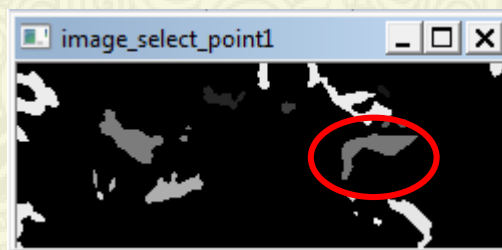
Software tool

Tool would need the user would need to select the ROI (Region of Interest) before the image could be processed. This was implemented using OpenCV algorithms

User selecting the ROI



Hippocampus isolated from ROI



The tools developed were tested by neurologists from KMC Manipal and are still under development. We are currently focusing on increasing the speed of the devised algorithms and the accuracy of the results.



RENZURU

May 2014

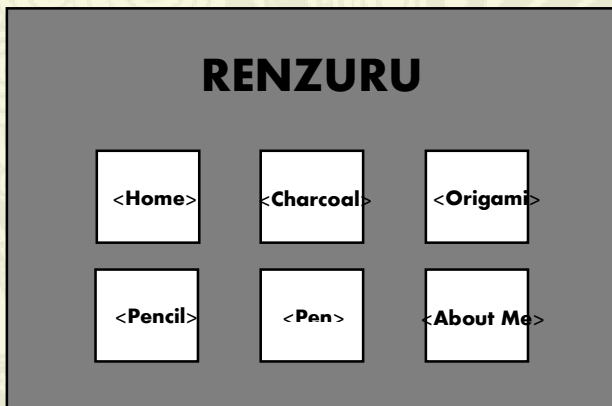
Design web page to showcase all of my art work over the years classified by media

RENZURU

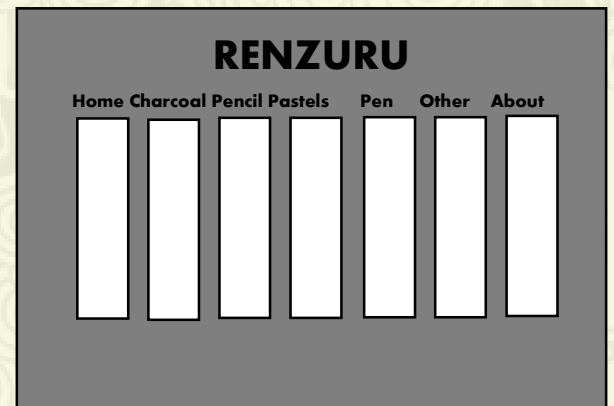
Design web page to showcase all of my art work over the years classified by media

INITIAL SKETCH UP

Front Page Designs



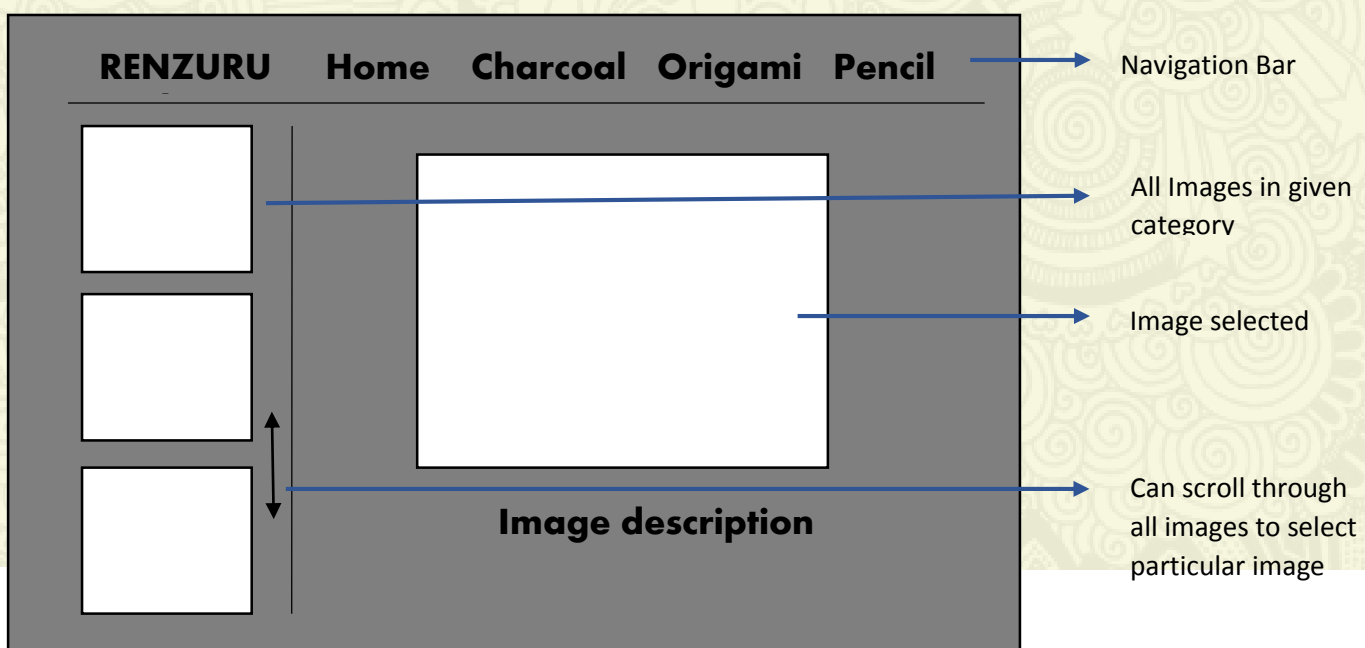
Not possible to easily add another category as the 3x2 grid layout would then be disturbed.



Easy to add more categories and increased space for a teaser on the content

Front page has images to access each page. Each tile has a teaser of the content in that particular media

Content Page



Web page design

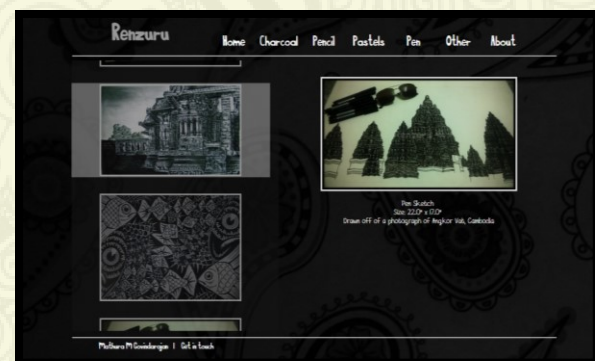
Using the above sketches, the initial web page was developed using HTML5, CSS3 and JavaScript

Below are screen shots of the page designed which is also available at- www.renzuru.herokuapp.com



Feedback and comments received

- Clean and concise design
- Intuitive in nature
- Very catchy front page. Conveys a lot about the work to be expected in the following pages
- Dark background fails to highlight the work, most of which is black
- Real estate is being wasted on images in the selection area— focus should be more on the selected image
- Adding a scroll bar in the selection area would increase ease of navigation



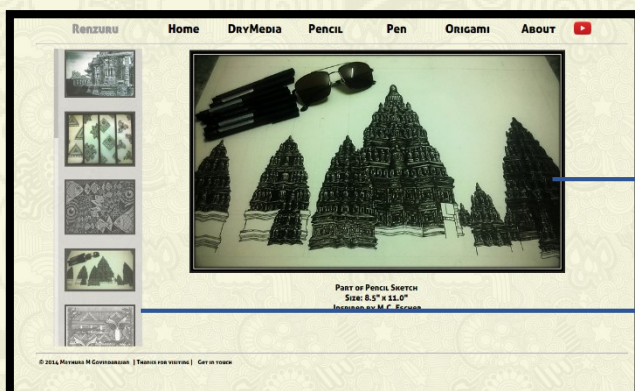
Web page re-design

With the above feedback the page was redesigned to the below format which is currently available at

- www.renzuruart.com



Lighter background



Link to YouTube channel to view animation projects

Increased focus on image selected

Smaller scroll area with a scroll bar