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# THE PORTFOLIO

AN INSIGHT TO CREATIVE COMPUTING PROJECTS



SCHOOL OF COMPUTING AND INFORMATICS  
CREATIVE COMPUTING



SCI//CC #02-2018  
ALL PROJECTS ARE A PRODUCT OF UTB

01

FOREWORD

03

PREFACE

05

3D ANIMATION  
& SHORT FILMS

*Short 3D Animation:  
Champie & Cricko*

*Turn Signals - A 3D  
Animation Short*

*Speculative Fiction  
Film: Here Again*

*Neurus: A Short  
Speculative Sci-fi  
Film*

15

AUGMENTED AND  
VIRTUAL REALITY

*ARCH - Augmented Reality  
Collection Hall*

*Augmented Reality Jerudong  
Park Postcard*

*Collaborative Augmented  
Reality*

*LAREVENT*

*Marker-less Augmented  
Reality Solar System*

*Brunei Virtual Museum (A  
Prototype Android 3D Game  
Application)*

*Learning Machine Part  
Assembly Through Virtual  
Reality*

31

ELECTRONIC VIRTUAL  
GAMES AND PHYSICAL  
BOARD GAME

*ArcLight*

*Projek Hikayat (Demo)*

*Rekishi: An Interactive Visual  
Novel Game (Demo)*

*Slime Hunt: A 2D Adventure  
Game (Prototype)*

*Against the Nature Board  
Game Prototype*

43

CREATIVE AND  
INNOVATIVE TOOLS

*Quran E-Learning using  
Speech Detection (QeSD)*

*Smart Device as a Creative  
Tool: Wiimote Whiteboard*

*The Creative Deck  
(Brand in Brief)*

*Self-Trackcam*

53

RESEARCH STUDY

*Investigative Study of Design  
and Art Style for Gamified  
Learning Management  
System*

CONTENT

The Portfolio: An Insight to Creative Computing Projects was introduced in 2017 to commemorate the first intake graduates of Creative Computing Programme Area. It is therefore my greatest pleasure to welcome you to the second issue made by the graduates of the second intake of Creative Computing Programme Area under the School of Computing & Informatics (SCI), Universiti Teknologi Brunei (UTB).

This creative magazine dedicates to annually showcase innovative projects made by the students which correlates with the main aims of the programme area. Not only that, the magazine offers an opportunity to exhibit students' fundamental knowledge and skills that could potentially attract future employers. This could be a good head start for us in the uprising competitive employment in Brunei.

*Naquuddin Ihsan*

Awang Muhammad Naquuddin Ihsan bin Awang Mat Japar  
Bachelor of Science (Hons) in Digital Media  
Creative Computing  
School of Computing & Informatics  
Universiti Teknologi Brunei

FOREWORD

Under the School of Computing & Informatics (SCI), Creative Computing Programme Area consists of two creative courses; Bachelor of Science (Hons) in Creative Multimedia and Bachelor of Science (Hons) in Digital Media, that was introduced in 2013 and attained accreditation from the British Computer Society (BCS), the Chartered Institute for Information Technology, earlier this year. With the current high demands in the creative industry, this programme aims to bridge the gap by providing all-rounded students in creative skills to offer. With this, it will not only help to train and nurture students, but also further polish their knowledge in creative arts to be future professionals. Moreover, both courses follows the rapidly growing technological advancements to ensure the skills equipped to the students are relevant to current industrial demands.

# PREFACE

**3D ANIMATION  
& SHORT FILMS**







Ady Majurinah binti Haji Majin

// Ady

»»

*When you feel like quitting, think about why you started.*

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# Short 3D Animation: Champie and Cricko

I have a passion in 3D animation for short animated film or series, movies, live actions and commercials. It is also my focus on TV production to improve the country's entertainment that can be aired at the nation's state broadcaster.

I enjoy doing it even though it is challenging. It requires some skills to make the 3D objects to life through movement. I need to be patient with overall animation process. From doing this project, I gain more knowledge, experience and skills.

## SHORT 3D ANIMATION: Champie & Cricko

ADY MAJURINAH HJ MAJIN  
BSCM/02/009/14  
BSC(HONS) IN CREATIVE MULTIMEDIA

### Synopsis

A short 3D animation between Champie(Chameleon) and Cricko(Cricket). Champie tries to catch Cricko as best as he could. Unfortunately, many ways that he has attempted, not give a good result. When he wants to have a break, there is some noise that disturbs him. Champie feels curious and tries to discover where the noise comes from. When he nearly reach his mission, something had happened to him.

### Objectives

To develop 3D animation short film that can grab audience attention.

To entertain people watching 3D animation besides promoting good value to people especially children through 3D animation story.

To find out if the viewers are enjoy watching from the test conducted that make them possibly watching the animation from this producer.

### Background Study

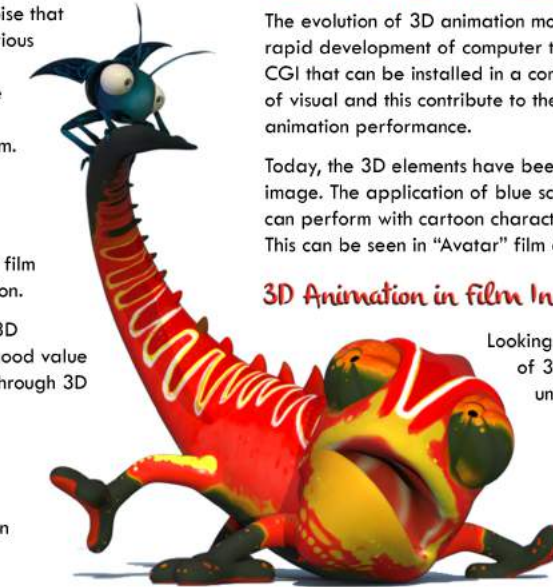
#### Evolution of 3D Animation

The evolution of 3D animation moves together with the rapid development of computer technology. The invention of CGI that can be installed in a computer bring a great view of visual and this contribute to the production of a good 3D animation performance.

Today, the 3D elements have been combines with the real image. The application of blue screen usage make actor can perform with cartoon character through editing process. This can be seen in "Avatar" film and many more.

#### 3D Animation in Film Industry

Looking at the development of 3D animation, it is undeniably that is one of the important elements in film industry. 3D animation brings the way movie presented to end user to a level where users can experience the things which they imagine in fantasy into reality.



### Animation Production Process

**Pre-Production** Storyline ⇨ Character Design ⇨ Storyboard

**Production** Modelling ⇨ Texturing ⇨ Rigging ⇨ Animation ⇨ Lighting ⇨ Rendering

**Post-Production** Composite ⇨ Editing ⇨ Sound Effects ⇨ Music Background

### Future Works

For the future, more scenes will be added to extend the time length of the animation. Develop a great 3D animation story with relevance sound and music.

### Conclusion

The 3D animation of "Champie and Cricko" is developed relies on humor, much like "Tom and Jerry". Most jokes are reachable, pleasant and enjoyable for more youthful watchers. 3D animation film is currently less being expose in Creative Productions and most of the TV production still focusing on film or drama rather than animation. Through this, it will be a good chance that the 3D animation will has future in our country.

### Reference

Tim, D. (2018). Animated Films. Retrieved January 11, 2018 from <http://www.filmsite.org/animatedfilms.html>  
The Process of 3D Animation. Retrieved 15th September 2017 from <https://mediafreaks.com/the-process-of-3d-animation/>  
Veiled Chameleon. (2018). Retrieved 1st April 2017 from <http://www.animalspot.net/veiledchameleon.html>





# TURN SIGNALS

### PROBLEM STATEMENT

Failure to use turn signals is now the leading cause of accidents in the US (Melwert, 2012)

### AIM

ENCOURAGE The Use of TURN SIGNALS

### OBJECTIVES

DEVELOP Engaging Video

RAISE Awareness

### TECHNOLOGY

AUTODESK MAYA

PHOTOSHOP

PREMIERE PRO

AFTER EFFECTS

### RESULTS

60 PARTICIPANTS  
30 MALE | 30 FEMALE

18 AND ABOVE  
LICENSED DRIVERS

POSITIVE INCREASE towards opinion on the usage of turn signals

#### BEFORE watching the video

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(a) The use of a vehicle's turn signals is important	0	0	0	15	45
(b) Neglecting the use of turn signals is dangerous	0	0	0	35	25
(c) Neglecting the use of turn signals can cause accidents	0	0	0	45	10
(d) Neglecting the use of turn signals can cause deaths	0	0	35	15	10

#### AFTER watching the video

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
(a) Neglecting the use of turn signals is dangerous	0	0	0	55	45
(b) The use of a vehicle's turn signals is important	0	0	0	55	45
(c) Neglecting the use of turn signals can cause accidents	0	0	0	55	45
(d) Neglecting the use of turn signals can cause deaths	0	0	35	15	10

### CONCLUSION

The project was able to meet the objectives and it is proven that 3D animation can be used to **raise awareness.**

### REFERENCE

Melwert, J. (2012). New Study Says Failure To Use Turn Signals Is A Leading Cause Of Car Accidents. [online] Philadelphia.cbslocal.com.

**Abd Mu'ain bin Awg Yahya**  
BSc (HONS) in Creative Multimedia  
B20152084

## Turn Signals - A 3D Animation Short

I specialize in videography and filmmaking. So I was not really into 3D animation although it is part of my degree programme. So I was basically doing this to push my limits and uncover my hidden potential. On the other hand, I really want to encourage you people to use your vehicle's turn signals.

Turn signals was quite an experience to develop as I myself have limited knowledge and skills in 3D animation. But I really did not expect that I can eventually do and finish this project, of course with the help of fellow lecturers, colleagues and my bestfriend "YouTube". To sum up, never be afraid to try new things.

Abdul Mu'ain bin Awang Yahya

// Pakzaki

My formula for success is a combination of passion and hard work. 97% of the time, it works every time.

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| 10





Farhanah binti Julaihi

// Farh



*You'll be surprised at how strong you are when you keep on having positive thoughts.*

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FARHANAH JULAIHI | BSC (HONS) IN CREATIVE MULTIMEDIA | BSCM/02/011/14

A young woman gains the ability to go back and forth to an alternate universe after she stumbled upon a mysterious orb in her backyard. At first she was in distraught, but then makes it her life's mission to find out what the universe is trying to tell her.

## SPECULATIVE FICTION FILM HERE AGAIN

### INTRODUCTION

Speculative fiction is any fiction with supernatural, fantastical, and futuristic elements in it. It is "any fiction in which the 'laws' of that world [explicit or implied] are different than ours" (Neugebauer, 2014).

This project features a film that carries the aforementioned genre. It explores a different aspect to filmmaking due to the incorporation of CGI (Computer Generated Imagery). This project also assess my skills in scriptwriting, 3D modelling, Visual Special Effects and Cinematography.

### AIM AND OBJECTIVES

The aim of this project is to produce a speculative fiction film that is realistic appearance-wise, evoke positive emotions from the audience and deliver an effective storytelling.

The objectives of this project are as follows:

- To publish a film that features locals acting in a Sci-Fi/Supernatural setting.
- To deliver a successful and convincing CGI.
- To introduce/contribute a CGI film in the country.
- To motivate local filmmakers to produce movies of this genre in the country.

### BACKGROUND STUDY & RESEARCH

Brunei film industry has the potential to grow. However, we greatly lacked productions or publications that discuss about what could happen in the future, an ideal world to live in, fantasy-themed scenarios and elements that utilizes fully of our wide range of imaginations. Why is the idea of new scientific discoveries, new technologies and different social system very favourable among all age groups?

Humans in nature, are imaginative creatures and we constantly live through changes everyday, no matter how small, the end result will be apparent and we will have to adapt to it.

- CINEMATOGRAPHY
- MONTAGE THEORY
- TZVETAN TODOROV'S NARRATIVE THEORY
- CHARACTER ARCHETYPES

### DEVELOPMENT PROCESS

**PRE-PRODUCTION**  
Scriptwriting --- Storyboarding --- Recce --- Casting

**PRODUCTION**  
Filming --- Voiceover Recording --- 3D - Modeling --- Rendering

**POST-PRODUCTION**  
Compositing --- VFX --- Editing --- Sound Design

## Speculative Fiction Film: Here Again

Editing videos is a hobby of mine, so what's more fun than doing what you like for a project? However, the addition of CGI and VFX is interesting yet challenging, and exploring this aspect of film-making gave me the motivation to overcome the project.

Creating a video is easy, everyone can do it. However, the tasks involved are not to be underestimated and they could still be very challenging especially when you want to evoke certain emotions from the audience. Doing the project was enjoyable, but I had also gone through many trials and errors during editing in order to produce the desired result.



# NEURUS

A SHORT SPECULATIVE SCI-FI FILM

## ABSTRACT

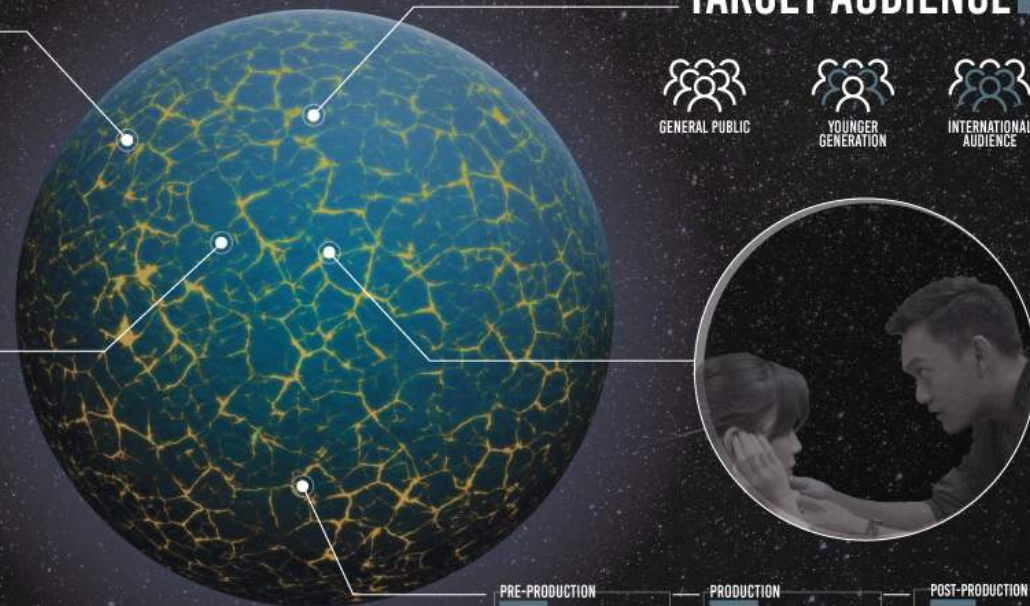
A 3-7 MINUTE FILM BASED ON A SPECULATIVE SCIENCE FICTION STORY THAT WILL CAPTIVATE YOUR IMAGINATION

## OBJECTIVES

TO CREATE A SHORT-FILM WITH A SCREEN TIME OF BETWEEN 3-7 MINUTES THAT WILL CAPTIVATE THE ATTENTION OF THE AUDIENCE

TO FOLLOW PROJECT MANAGEMENT, INCORPORATE THEORIES ON STORY BUILDING BLOCKS, CHARACTER ANALYSIS, CAMERA MOVEMENT & ANGLES, SOUND EFFECTS AND VISUAL EFFECTS

## TARGET AUDIENCE



PRE-PRODUCTION	PRODUCTION	POST-PRODUCTION
DEVELOPING A GREAT STORY SCRIPT WRITING STORYBOARD CHARACTER ANALYSIS PLANNING & SCHEDULING CASTING FINDING LOCATION	BLOCKING & REHEARSAL BRIEFING SETTING UP ENSURING STAGE LINE ENSURING EYELINES & HEADROOM PLANNING & SCHEDULING	IMPORTING MEDIA SYNCHRONIZING SOUND TRANSITIONS & CUTS VIDEO EDITING TECHNIQUES SOUND EFFECTS VISUAL EFFECTS 3D MODELLING IMPLEMENTATION OF CGI

## Neurus: A Short Speculative Sci-fi Film

All my life I have been mesmerized with the wonders of films. I define films as a gate way to the improbable, a spaceship that transports you to a different dimension, a world in the eyes of the film makers. I wanted the audience to see the world as I see it, endless possibilities.

I am not going to lie, the journey (of this project) was not an easy one. Problems arose left and right, however it taught me more than I could've imagined. I have a new found respect for all film makers.



Paul Michael  
Corporal Marquez

// Paul Marquez



*Quam bene vivas refert non  
quam diu.*

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# AUGMENTED AND VIRTUAL REALITY







Hajah Nur Amalina  
binti Haji Abdul Manaf

// Lina



*Do something that makes you happy, even if it means you have to work twice harder than the others.*

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# ARCH - Augmented Reality Collection Hall

I wanted to create an object recognition AR (Augmented Reality) application with 3D animation to provide information through visuals.

It (the project) was really challenging but it was worth the time. All the hard work going back and forth with the design and implementation paid off when receiving positive feedbacks from the users.

## ARCH Augmented Reality Collection Hall

HJH NUR AMA LINA BINTI HI ABD MANAF  
BSDM/02/013/14  
APRIL, 2018

**ABSTRACT**

The museum has many educational artifacts which represent Brunei but sadly lacked of attraction. Major upgrade to grab visitor attention is yet to be implemented. Looking at this, in cooperating technology in the museum might be one of the solution. We opt by creating an app for mobile device with Augmented Reality which can help convey information more effectively. In this report, we talk about the problems the museum currently faced, where survey has been done through questionnaires and interview. In hope to solve the problem, we describe the propose objectives in implementing ARCH app to the museum. Features and interface design for ARCH are also included in this report.

**OBJECTIVES**

To Create visual tour guides that are adaptable, updatable and viewable without special devices (using everyday mobile devices only). To develop a range of animation for the artifacts. To implement Augmented Reality that can recognize the artifacts. Providing information through visual and narration.

**FEATURES**

**Augmented Reality**  
Wikitude have provided features like marker-less tracking. So user can scan the object itself without having to use tracking marker.

**3D Animation**

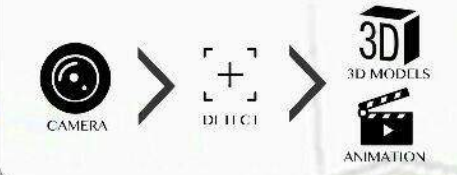
We will capture 4 artifacts from the Museum and translate them to 3D models which will later be animate to create compelling content for visitor to enjoy during their visit.

**Videos and Narration**

Aside from AR feature, we also embedded videos on the history of the museum and some events related to the museum in the app. Not only that, narration while using AR features will also be include to give information on the artifacts.

**ARCHITECTURE**

ARCH will be setup in the most direct way. Where user only have to scanned the selected objects and 3D objects and animation will pop up right away as well as narrated explanations about the object. Also, user will be able to interact with the 3D object; rotating and enlarging the object.



**IMPLEMENTATION**

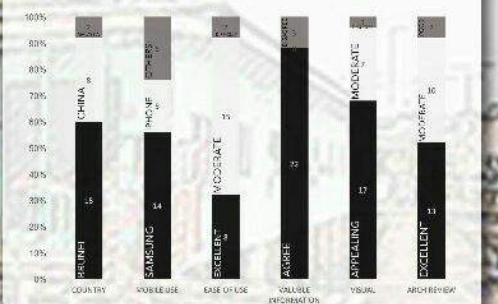
ARCH has three main phases: (i) Capturing target object and converting them to Wikitude Target Object, (ii) Developing 3D Model using Maya, and (iii) Integenerating both the target object and the models in unity using C# programming and wikitude prefabs.

ARCH is using a video based marker, or in Wikitude terms Wikitude Object Collection or WTO, which will enable unity to recognize the object during operating AR.

Object Tracker Script allows ARCH to instantiated when the object tracker finds what its looking for.

**RESULT**

Through the experiment we have conducted, it was agreed that adding animation helps catching visitor attention on the artifacts. Augmented Reality also plays the big role in catching the participants interest during the experiment. Although the age range were towards the older user, they still can operate ARCH and understand the information delivered.



**OUTPUT**



References:  
 \*Wikitude Support, (2018), <https://www.wikitude.com/external/doc/documentation/notes/android/objecttargetguide.html#best-practice-for-object-targets>. [Accessed 25 February 2018].  
 \*Wikitude Support, (2018), <https://www.wikitude.com/external/doc/documentation/studio/targetmanagement.htm#object-targets>. Retrieved (25 February 2018).



**PROJECT MOTIVATION**  
As picture postcard seems to be forgotten through time and technology, it is no longer something that travellers will buy. Hence, in order to make postcard popular again, AR postcards are made to provide an enjoyable experience by displaying pop up animation and sound.

**OBJECTIVES**  
(1) To enhance the willingness to buy the postcard,  
(2) To increase the excitement while viewing postcard,  
(3) To enhance the user's memories commemoration significance.

**TOOLS USED**

**FEATURES**  
(1) 3D Models of JP rides.  
(2) Interactive AR apps.  
(3) AR postcard.

**AUGMENTED REALITY JP POSTCARD**  
Combination of multimedia and picture postcard by innovations of Augmented Reality (AR). The AR systems overlay the users' view of the real world with real-time 3D graphics. AR transforms the earth around into an advanced interface by putting things in reality. Through cell phones, AR acts like a magic window; user downloads the AR application and through the viewer of the cell phones, user can see and enjoy 3D models.

**FUTURE ENHANCEMENT**  
- More close replication of JP Playground.  
- More version other than JP itself.

**CONCLUSION**  
Most respondent of survey accepted to have the capacity to raise utilizing AR innovation and its application on a souvenir. This thought conveys euphoria & additional excitement to the user. The objective of this project has been successfully met according to post online survey that has been answered by society. By utilizing 3D animation, it can wipe out the customary and unexciting method for sending and getting postcard, which means to a better way for review the postcard.

Dayang Amirah Husna bte Awang Osman  
B20152086  
BSc (Hons) in Creative Multimedia

## Augmented Reality (AR) Jerudong Park (JP) Postcard

This project was done to expose the innovation of Augmented Reality in Brunei Darussalam especially in Tourism industry. It also to make the postcard popular again by providing enjoyable experience by displaying pop-up animation and sound.

It might be tiring doing the project that I have never experienced before, but it it was indeed a very enjoyable and rewarding experience along the way. I have grown to be stronger, patients, and understanding and able to learned Unity for developing this project.



Dayang Amirah Husna  
binti Awang Osman

// Amirah

“ My name is Amirah and I am a student of creative multimedia. I'd like to bring my creativity and views to both design company and its customers that appreciate my skills.

### CONTACT DETAILS

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binti Haji Awang Tengah

// Fiqah HT



DUIT: Do'a, Usaha, Ikhtiar, Tawakal

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## Collaborative Augmented Reality

OVERVIEW

COLAR (Collaborative Augmented Reality) is an augmented reality mobile application which runs on Android mobile devices. This application has a feature which allows multiple users to project an augmented reality 3D model of an animated heart from any viewpoint from a specific target marker.

PROBLEM STATEMENT

USER REQUIREMENTS

Augmented reality is now a well-known technology ever since Pokemon Go is created. Many developers are taking this opportunity to expand the potential of using this technology in terms of educational purposes. However, many of the augmented reality applications are designed as a one-to-one relationship with the user, hence limiting the interaction between multiple users.

The term "collaborative learning" refers to instructional methods whereby students team together upon completing a certain task (Hiltz S. R., 1998). This encourages students to reach out to one another to solve problems and share knowledge for deeper learning and understanding in a community.

1. Android mobile devices of version 4.0 and above
2. Target marker
3. Mobile device have functioning rear camera.
4. Mobile device able to connect to wifi/mobile hotspot

OBJECTIVES

SYSTEM ARCHITECTURE

- Develop an augmented reality mobile application available for Android OS
- Apply networking feature in the application to enhance collaboration
- Include touchscreen input to promote interactivity
- Input an educational content in the application for learning purposes.

```

graph TD
    C1[Client] --> S[Server]
    C2[Client] --> S
    S --> SI[Scan Image]
    SI --> IR[Image Recognition]
    IR --> DVC[Display Virtual Content]
    DVC --> C1
    DVC --> C2
    
```

FEATURES

TOOLS USED

1. Augmented reality of an animated 3D model of a human heart.
2. Touchscreen virtual buttons to show various animations.
  - Heartbeat
  - Labelled heart
  - Cross-section of heart
3. Networking ability for multiusers

TARGET AUDIENCES

CONCLUSION & FUTURE WORKS

1. Public residents
2. Students and lecturers studying or teaching biology or biomedical sciences

The development of an educational collaborative augmented reality mobile application is accomplished to some extent.

In the future work, more networking abilities and a more diverse content should be applied. Beta testing should be carried out and this application may be attempted towards iOS mobile devices.

**Reference:**  
 Hiltz, S. R. (1998). Collaborative Learning in Asynchronous Learning Networks.


# Collaborative Augmented Reality

I was interested to try this project as the experience I had in developing an augmented reality mobile application during my CGP (Computing Group Project) period motivated me to explore the use of this technology further. The potential it has for the educational system and that it benefits the society, brings value to the purpose of developing the application. I believe that augmented reality helps improve learners' motivation and anticipation.

I find it very challenging to do this project as it actually requires an intermediate level of programming skills and I am still in the beginner level. I honestly think the application needs more improvements but overall doing the project helps me gain more knowledge and experiences.



**LAREVENT**  
HAJI AZHAR LIZAM BIN HAJI ZAINUZZAMAN  
BSCM/02/003/14



اوبنورسيپتي تيكنولوگي بروني  
**UNIVERSITI TEKNOLOGI BRUNEI**

**PROJECT OVERVIEW**

'LAREVENT' is using iOS platform (iPhone). Utilizes the Augmented Reality (AR) system to empower and encourage the end-users to engage and exercise.

Requires user to physically chase after the floating icons within a designated area in order to access the questions on checkpoints.

**PROJECT OBJECTIVES**

Motivate and encourage user to experience technology with physical fitness

Centralized of Public Run Events

To aid in the shift of lifestyle choices of Bruneians

To address medical issues via prevention rather than cure

**FEATURES**

Leniency of time to join events up until the completed time specified

Able to view and joined after register to the app

Experience the AR technology and games on checkpoints

Organize your own Training Event or Public Event

**BACKGROUND PROBLEM**

"At the same time, the minister pointed out that the incidence of diseases such as high blood pressure and diabetes are now occurring at a much younger age of around 20-30 years, adding that "this is an alarming situation". "

As mentioned in the Borneo Bulletin.


**GUI DESIGN**



**RESULTS & SOFTWARE**

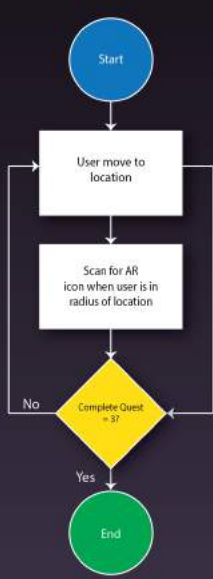
Technology has make huge impact in current generation. It is organize to invite public and encourage them to engage and exercise not only their physical abilities but also enhance their mental capabilities.

  
ADOBE ILLUSTRATOR

  
XCODE (IOS)

  
ADOBE PHOTOSHOP

**PROJECT FLOW**



```

graph TD
    Start((Start)) --> Move[User move to location]
    Move --> Scan[Scan for AR icon when user is in radius of location]
    Scan --> Quest{Complete Quest =?}
    Quest -- No --> Move
    Quest -- Yes --> End((End))
    
```

# LAREVENT

This project is an entertainment application, developed using the IOS platform. It is to tackle the current obesity problem the public is facing. This has become a problem within our society and with the help of this application, Larevent, which is a combination of both Technology and Fitness into one convenient application, it will hopefully help tackle the current obesity issue.

Alhamdulillah. Even though the time duration to complete this project is limited, and yet the scope of the Final Year Project has been achieved. This project can be expanded to a bigger scope. As of now, the prototype is included with Augmented Reality, Games and a centralized of run events.



Haji Azhar Lizam bin Haji Zainuzzaman

// Azhar

“The thing about graphic design is that it has no limits. Designers must always think outside the box.”

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Muhammad Khairul Fadhli bin Sani

// Fadhli



*A person who never makes a mistake will never try anything new.*

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**MARKER-LESS AUGMENTED REALITY SOLAR SYSTEM**

**OVERVIEW**  
AR Solar System is an android application that uses marker-less augmented reality (AR). The user can map 3D Solar System onto the real world and can walk around it to view from one planet to the next.

**OBJECTIVES**

- To let the user gain a sense of scale of the solar system.
- To help user learn in a different way, in a more immersive and intuitive way.
- To use AR anywhere using user's android mobile without the need of picture/marker-base or any special hardware.

**PROBLEM & SOLUTION**

**PROBLEMS**

- People only see informations on solar system in picture base format.

**SOLUTION**

- To develop an android application that can help user understand informations more in detail and help the user visualize how it looks like.

**TARGET AUDIENCE**

This application basically target at young generation especially students from primary schools age around 12 years old as main target audience. Nonetheless, those who are interested in space exploration or would like to experience virtual object in real world are also considered as target audience.

**SOFTWARE USED**

Unity3d, Blender3d, Ai, Android

**FEATURES**

- Place 3D Planets in Solar System onto real world surface without any marker.
- Display Planet infos when hover at certain distance between the planet.
- Resize 3D planets
- Display Earth's day and night view
- Quiz with timer

**SCREENSHOTS OF APPLICATION**

Augmented Reality Solar System, Earth is only planet with liquid water.

**FUTURE ENHANCEMENT**

- Improve Functionality
- Add more content
- Improve animations
- Quiz difficulties
- Online Collaboration
- Development for iOS devices
- More Language Settings

MOHD KHAIROL FADHLI BIN SANI (BSDM/02/014/14)

# Marker-less Augmented Reality Solar System

The reason why I decided to choose this project is because I want to experiment and to test my skills that I had gained throughout my four years as an undergraduate student at Universiti Teknologi Brunei (UTB).

It was the most adventurous and memorable project I have ever experienced. From meeting new people to gaining new knowledge. I can say that it has been a crazy roller coaster ride.



## Brunei Virtual Museum

- A Prototype Android 3D Game App -

### AIMS & OBJECTIVES

(1) Develop and investigate the potential of using electronic video games in helping to preserve Brunei traditional culture and heritage among the younger generations of Brunei.

(2) Create a playable mobile game application that meets the minimum standard of game-making as an independent (indie) game developer.

### DEVELOPMENT TOOLS

Hardwares  
  
 Softwares

### RESULTS & ANALYSIS

27 respondents

(1) Do you think this type of game will help to preserve Brunei traditions & culture?

92.6% Agree	7.4% Disagree
-------------	---------------

(2) Do you think this game app has the potential to be a pioneer in game development in Brunei?

85.2% Agree	14.8% Disagree
-------------	----------------

The feedback from the survey had shown that the aims & objectives have been met.

### GAME FEATURES

- (1) Museum Exploration
- (2) Item Exhibitions
- (3) Quiz Puzzles

### INTRODUCTION

Brunei Virtual Museum (BruVM) is an Android-based 3D game app that revolves around the idea of creating an open-air virtual museum concept which focusing primarily on Brunei's traditional items and environment of living on a water village back in the 19th century. It is a game that implements mixed popular genres of adventure and puzzle-solving together with an educational genre that encourage the player to explore the museum and discover the contents of the game.

### USER REQUIREMENT & APP DOWNLOAD

V5.0 & above

<https://rabiatulmha.itch.io/brunei-virtual-museum>  
<https://www.instagram.com/bruneivirtualmuseum/>

### PROJECT DONE BY

Rabiatul Adawiyah Mudim Haji Amran  
(BSCM/02/014/14)

# Brunei Virtual Museum (A Prototype Android 3D Game Application)

This project is created out of my personal interest and devotion towards Brunei traditions and culture. I personally like the concept of preserving our precious cultural heritage in any kind of form and I also happened to have a huge interest in trying to develop my own video games. So, combining the two personal interests together, I have managed to create a prototype of Brunei Virtual Museum game app for Android phones and tablets. And so far, I have received positive feedback from the people who had tried out my game app saying that they do like the concept of using video games to help preserve Brunei cultural heritage and would like to see more of it in the future.

I enjoyed creating the game app and it had definitely given a huge impact to help me discover my own style of graphic designing, 3D modelling, code scripting, project managing and many other various skills. If given the chance of having a better platform, knowledge and skills in the future, I would like to develop the game app further with better enhancements or even start from scratch to develop a similar concept game with a different approach to the game genre.



Rabiatul Adawiyah  
binti Mudim Haji Amran

// Rabi

*I am very passionate in doing my creative works that are often fused with my organization skills and I would usually deliver tasks efficiently to the highest standard possible.*

### CONTACT DETAILS

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<https://rabiatulmha.itch.io/>





Nursheila binti Ziziumiza

// Sheila



Reliable Work  
Sustain Discipline

**CONTACT DETAILS**

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# Learning Machine Part Assembly Through Virtual Reality

The project's motivation is to develop virtual assembly simulations for basic learning and training for employees and students using VR (Virtual Reality) technology and Leap Motion sensors. It also serves as an educational tool to enhance the efficiency of practicing assembly and disassembly in Centrifugal Pump.

Overall experience in building this project is challenging as it requires programming skills and modelling skills in 3D. However, I really enjoyed doing this project because I learned a lot during the development process and with hard work, patience and understanding, I was able to solve and overcome everything to create this project.

## LEARNING MACHINE PART ASSEMBLY THROUGH VIRTUAL REALITY

Nursheila Ziziumiza | BSDM/02/01/14 | BSc in Digital Media

### INTRODUCTION

Virtual reality systems (VR) are used to simulate, analyze and optimize mechanical processes including assembly. Learning machine in VR is also known as *Virtual Assembly*. It enables the user to learn and practice the *Virtual Assembly of Centrifugal Pump* by using the Leap Motion controller to capture every movement of the user's hand onto the integrated 3D models in Unity software.

### BACKGROUND STUDY

Virtual reality is a technique used to recognize nature, simulate properties, and make better adaptations and natural use (Zhao, 2009). With the aids of virtual reality, it can create productivity enhancement for human interaction in a digital environment.

Jayaram et al. (1997) defined *Virtual Assembly (VA)* as the use of computer tools to make or "assist with" assembly-related engineering decisions through analysis, predictive models, visualization and presentation of data without physical realization of the product or supporting processes. It was developed as the ability to assemble a real representation of the physical model in Unity software by simulating the natural movement of the human hand.

### OBJECTIVES

- To construct an optimal virtual environment for learning the assembly of engineering parts safely.
- To integrate user interaction which allows users to direct capture the physical model.
- Allow users to practice simultaneously; improving their cognitive skills and motor skills until they become competent.

### PROBLEM STATEMENT

Handling mechanical equipment can be dangerous and leads to various injury. This may discourage some people; and also a hassle for educators to teach and students to learn.

The process to procure trainers and engineering equipment are usually costly and time-consuming. Thus, a learning machine assembly through VR is introduced.

### FEATURES

Panoramic 360°

Interactive Detection

Gesture Recognition

Hands-on

Gesture recognition techniques developed for tracking and recognizing various hand gestures which can be detected with high accuracy, depending on the quality of the input and the algorithm's approach.

### WORKFLOW

### RESULTS

96%  
80%

of students and educators agreed it can stimulate properly with physical objects in virtual environment.

100%  
100%

of students and educators deemed the virtual environment fit with engineering concept.

84%  
80%

of students and educators believe it can improve their competency skills.

### TARGET AUDIENCE

Engineering students and potential workers.

### Reference

Jayaram, S., Connacher, H. I., & Lyons, K. W. (1997). "Virtual Assembly Using Virtual Reality Techniques," *Computer Aided Design*, 29(8):575-584.

Zhao, Q. P. (2009). "Overview of Virtual Reality," *Science in China Press*, 39(1):2-46.

### FUTURE ENHANCEMENT

- Detail information will be given on each part of components and the process of operation to be added.
- Apply some tools which allows different gestures to stimulate real life task.
- Sequence of operating order that allows the learners to follow the standard operating procedures (SOPs) of assembly and disassembly.



**ELECTRONIC  
VIRTUAL AND  
PHYSICAL  
BOARD GAMES**





Muhammad Ahmad Shafiee  
bin Sufray

// Schaff



1 + 1 = 3

### CONTACT DETAILS

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twitter.com/hikaru702

## ArcLight

I wanted to create a multiplayer game that is unrestricted to platforms and enjoyable to all, and I have always wanted a reason to create an indie game.

During the development of this project, there were stressful times, but it was also fun on certain stages. Creating this game is like making a dream nearly come true.

Simple gameplay with  
cute 2D graphics

ArcLight is a 2.5D hack-n-slash game backed with a cute pixel art as its theme and graphics.

With simple controls, players can adapt to the gameplay without much difficulty.

Explore different kinds of places, train your character and fight enemies of various types from small goblins to huge monsters to save the pixelated 2D world from being plunged into chaos!

Available in multiple  
gaming platforms

ArcLight is built with interface and gameplay that is acceptable to different kinds of target platforms. Whether you are a mobile gamer, PC gamer or a console gamer, ArcLight aims to be available and playable on vast range of platforms

- \* Prototype currently available on Windows PC & Android
- \* MacOS and iOS version prototype will be available soon
- \* Console version are planned to be released soon

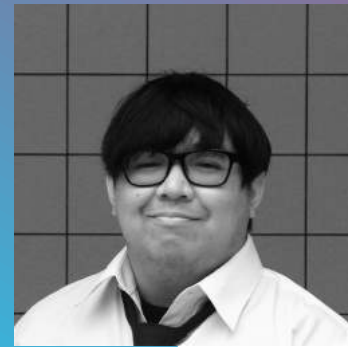
Networked Cross-platform  
Multiplayer

Play ArcLight with your friends regardless which game platform they are using! Platform difference will not be a barrier preventing you from playing with your friends anymore!

Did we forgot to say up to 8 players can join as a group regardless of platform?

Try out the prototype version of ArcLight!  
<https://goo.gl/X2Qg4D>





Farhan Nuradli bin  
Abdul Karim

// Farrens



*Always find your reason  
to create.*

### CONTACT DETAILS

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UNIVERSITI TEKNOLOGI BRUNEI

# FINAL YEAR PROJECT

## PROJECT HIKAYAT

(DEMO VERSION)

DUHAI ANAK MUDA, KINI MASANYA  
UNTUK MEHULIS HIKAYATMU!

(HEY YOUNG ONE, IT IS TIME FOR  
YOU TO WRITE YOUR OWN SAGA!)

Project HIKAYAT is a student proposed project which is a Adventure PC/Mac game which has historical elements, interaction-based and problem-solving aspects.

**Aims:**

- To provide a new medium of storytelling of ancient Brunei.
- To have the user to make use of their problem-solving skills.
- To provide some context what it is like to live the times of ancient Brunei.
- To try meet the demands of the current call for local developers.
- To make Project Hikayat to have a small fanbase and supporters for the full development of the game and future series.
- To make a contribution to make history relevant and engaging again.

**Objectives:**

- To create a game with a setting of the Ancient Brunei.
- To create a deliverable up at an Indie Level.
- To create a deliverable demo which interested players can play.
- To make a contribution to make history relevant and engaging again.

DISCOVER BRUNEI OF THE PAST

MEET KEY FIGURES OF  
BRUNEI'S FOUNDING

HELP YOUR PEOPLE AND SEE  
THE VILLAGE GROW

INTERACT WITH INTERESTING  
WILDLIFE

GET TO KNOW THE INSPIRATIONS  
BEHIND PROJECT HIKAYAT

SEE THE TOOLS THAT BRING  
PROJECT HIKAYAT COME TO LIFE

POWERED BY

CREATED BY

**BOSCA CEOIL**

**PISKEL**

CREATED BY

**FARHAN NURADLI ABD. KARIM**  
BSDM/02/016/14  
BSc. (Hons.) in Digital Media

## Project HIKAYAT (Demo)

I have always considered myself a pretty hardcore gamer but my curiosity always been a trait of mine that I have wanted to know more about how can I make one myself. I believe video games has a lot of potential beyond entertainment value. Through games, I have made new friends and teammates, gained new ideas and insights that have crossed beyond borders. That is something I really appreciate and wish to share with everyone else. Even more coming from this little country of ours.

It (the development) was an eye-opening process considering there are many aspects developers should cover in the creative process. The interactions, the feel, the real-life references and relations, the aesthetics... These are just the 'little' things that make a very memorable title. I do hope this project can leave an impact to those who try and looking forward to playing it.





Ammal Rasyidah binti  
Muhammad Amin

// Ammal



*Life begins after coffee.*

**CONTACT DETAILS**

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## Rekishi: An Interactive Visual Novel Game (Demo)

I have always loved visual novel games, as well as anime-style art, and I have constantly wondered how a person or a group of people make these games. Visual novel games contain rich stories with unique character backgrounds, and the illustrations are most often beautiful, with their rich and vibrant colors. So, from there, I decided to make one of my own. Besides being a personal interest, it is also a challenge for me to go through as I test myself in terms of storywriting, character designing, and illustrating backgrounds.

I honestly enjoyed working on this project, as I have always wanted to create a visual novel game. It has been a learning experience for myself, as I improved my story writing technique, and I get to improve my skills in drawing illustrations as well as coming up with character designs that fit the concept of Rekishi's story.

*Rekishi is an interactive visual novel game developed on Windows platform using Unity Technologies (R). This student proposed project is developed in a demo scale, and it contains digital, visual art illustrations, branching narratives and puzzle game aspects (in future enhancements) to enhance the player's game experience further. So, embark on a journey to discover the secrets hidden behind the main character's family history.*

**OBJECTIVES**

- // To build and develop a visual novel game using Unity(R)
- // To complete a demo version that covers the prologue chapter
- // To deliver an interactive and dynamic visual novel to the audience
- // To find out if users experience a state of flow during the demo testing
- // To incorporate puzzle game aspects in the visual novel



**FEATURES**

- // Prologue chapter, with three different endings
- // Digital art illustrations
- // Branching narratives
- // Background music and SFX
- // Animated backgrounds and many more!

**TESTING & RESULTS**

58% of testers experienced the state of flow during the demo, while 91% were invested in the Rekishi's story content.

**DEVELOPING TOOLS**







# SLIME HUNT

A 2D ADVENTURE GAME (PROTOTYPE)

MARIATUL KIPTIAH BINTI ARIFFIN (BSDM/02/009/14)



### Introduction

Slime Hunt is a 2D single player adventure game created using the Unity Engine where the player will control the protagonist and interact with the fictional game environment. It will have elements of an RPG e.g. levelling up characters and taking quests.

The main aspect of this project is the methodology used in developing SH, along with the design choices throughout the development processes.

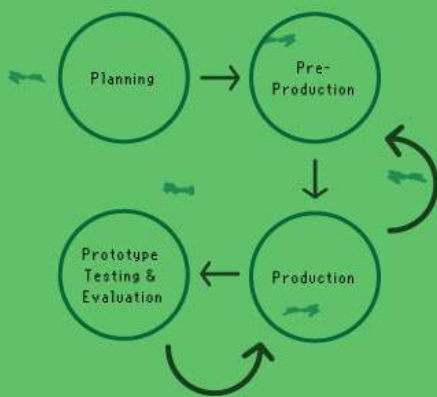
### Objectives

1. To present a methodological approach that can act as a framework for future local game developers, taking into account the scope and requirement of the local curriculum and potential marketing,
2. To present a visual art style that is different than other games, visual representation is essential to games depending on how impactful they are to the audience,
3. To present functioning scripts that fulfils the basic gameplay of SH,
4. Create a game prototype that presents the visual representation and playable function as an example of the newly implemented method of game development life cycle.

### Motivation of Study

The frustrating lack for local support and investment for a proper game development methodology that compliments the local curriculum is the main motivation behind this project.

### Design & Implementation



The planning stage consist of brainstorming the game concepts, features and resource studies. Pre-Production stage is where assets are design using Adobe Illustratar and this took the longest time. Production is the game development using Unity 3D. Production and Pre-Production stage are cycle back and forth due to constant changes due to design difficulties. Prototype Testing & Evaluation uses online survey and 3 minutes of gameplay video to get feedback.

### Results

Slime Hunt is completed in less than three months and despite the prototype being functional, it is still missing some important features.

The propose methodology is able to be used by a single individual and with the success of a playable prototype, the methodology proves to be a success and other locals who inspired to become game developers can implement this game development methodology to create their own game.



### Future Works

For future improvements, Slime Hunt will add more RPG features such as skill trees or crafting. The thesis can be used as a reference to create a proper game methodology and by having a game development methodology based on local studies can increase the productivity of native independent game developers.

## Slime Hunt: A 2D Adventure Game (Prototype)

"I like games. I like Slime."

Slime Hunt is a project inspired by my passion for Video Games. It is a 2D adventure game that features basic RPG elements and hand-drawn graphics. Taking control of Linde, a slime monster, players embark on this short prototype to experience this vibrant fictional world.

Game development is challenging especially if it is developed by only one person. I find myself having difficulty with the design aspect due to the constant need to redo the design. Yet, I found myself enjoying the experience, venturing to new and unknown territories with preparation from my past modules.



Mariatul Kiptiah  
binti Ariffin

// Mar



*If your goal is blocked,  
slither your way through!*

### CONTACT DETAILS

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DK NURUL AQILAH BTE PG HJ EMRAN (BSCM/02/010/14) BSC(HONS) IN CREATIVE MULTIMEDIA

# AGAINST THE NATURE

BOARD GAME PROTOTYPE

### OVERVIEW

A BOARD GAME THAT TEACHES PLAYERS ON WHAT TO ANTICIPATE IN REAL LIFE NATURAL DISASTER SITUATION AND TO UNDERSTAND THE IMPORTANCE ON BEING PREPARED.

THE GAMEPLAY ALLOWS THE PLAYERS TO CRAFT SURVIVAL KITS TO PREPARE THEMSELVES FOR WHEN NATURAL DISASTER HITS. THIS CAN BE APPLIED IN REAL LIFE SITUATION WHEN IT OCCURS AND SPREAD AWARENESS ON THE COUNTER MEASURE.

### FEATURES

1. COMPETITIVE AND ALSO CO-OPERATIVE GAMEPLAY.
2. STRATEGIC DECISION, CRITICAL THINKING ON PROBLEM SOLVING.
3. AWARENESS TO THE UNFORESEEN NATURAL DISASTER.

### GAME COMPONENTS

MAIN BOARD • PLAYER BOARDS • 3D RESOURCE DISASTER CARDS • ACTION CARDS • MATERIAL CARDS • RESOURCE CARDS • TOKENS

### AIMS & OBJECTIVES

1. TO SPREAD AWARENESS ON NATURAL DISASTER THROUGH BOARD GAME.
2. TO PROVIDE NECESSARY MEASURES TO TAKE IF NATURAL DISASTER GOING TO OCCURS.
3. TO INTRODUCE A LOCAL BOARD GAME.

THE OBJECTIVE OF THE PROJECT IS TO CREATE A BOARD GAME WHICH HAS EDUCATIONAL ELEMENTS IN IT WITH VISUALLY AESTHETIC ENVIRONMENT WHERE PLAYERS CAN IMMERSE THEMSELVES IN IT AND CREATE AWARENESS ABOUT NATURAL DISASTERS BY LEARNING WHILE HAVING FUN. IT IS ALSO TO CONDUCT A STUDY TO SEE WHETHER PLAYERS' AWARENESS ON NATURAL DISASTERS ARE RAISED AFTER PLAYING THE GAME.

### GAMEPLAY

ASSIGN 1 PLAYER TO BE THE GAME MASTER TO TRACK ON HOW MANY TURNS LEFT BEFORE THE DISASTER HITS.

WHEN PLAYERS READY TO START THE GAME, ONE OF THE PLAYER CAN DRAW A "DISASTER" CARD. PLAYERS CAN TAKE UP TO 5 ACTIONS WHICH MEANS PLAYERS CAN DO 5 THINGS IN THEIR TURN. FOR 1 ACTION, PLAYER CAN:

1. DRAW "MATERIAL" CARD
2. DRAW "ACTION" CARD
3. PLACING "MATERIAL" CARD ON THE "PLAYER" BOARD
4. USING THE "ACTION" CARD
5. SWAPPING A "MATERIAL" CARD WITH THE PLACED "MATERIAL" CARD ON THE "PLAYER" BOARD ON THE CRAFTING SECTION (IN CASE PLAYERS MADE MISTAKES ON THEIR CRAFTING)

THE MAIN OBJECTIVE OF THE GAME IS TO SURVIVE ALL THE NATURAL DISASTERS WHILE TRYING TO GET RESOURCES TO PREPARE THEMSELVES WHEN THE DISASTER HITS! A PLAYER CAN WIN AFTER 4 ROUNDS OF GETTING HIT BY RANDOM DISASTERS THEY DREW FROM THE DECK AND GETS THE MOST SCORE THAN THE OTHER PLAYERS.

### TESTING & RESULT

THE FIRST PROTOTYPE OF THE GAME IS BEING PRINTED OUT WITH JUST USING SIMPLE TEXT-BASED PAPERS AFTER FINALIZING THE GAME MECHANICS JUST TO TEST WHETHER THE GAME MECHANICS WORKS OUT DECENTLY, TO TEST THE OVERALL FUNCTIONALITY OF THE GAME, IF THE NUMBER OF CARDS ARE SUFFICIENT ENOUGH FOR EVERY PLAYERS FOR THE GAME AND IF THERE ARE ENOUGH TURNS FOR THE PLAYERS TO ACTUALLY GET READY FOR THE UPCOMING DISASTER.

90% PLAYED BOARD GAMES BEFORE

50% VERY UNLIKELY TO BE PREPARED TO COUNTER IF NATURAL DISASTER HITS

### AFTER PLAYING THE BOARD GAME

90% LIKELY AWARE ON NATURAL DISASTER

50% MENTALLY PREPARED ON NATURAL DISASTER

### CONCLUSION

IN CONCLUSION, AGAINST THE NATURE HAVE BEEN SUCCESSFULLY DESIGNED AND DELIVERED.

THROUGH THE TESTING OF THE GAME WITH THE PARTICIPANTS AND THE QUESTIONNAIRES, THE RESULTS WERE ANALYZED AND SHOWN THAT THROUGH A BOARD GAME, THE AIMS AND OBJECTIVES OF THE PROJECT WERE ACHIEVED; IT CAN INCREASE THE AWARENESS ON NATURAL DISASTER, TO PROVIDE NECESSARY MEASURES TO TAKE IF NATURAL DISASTER GOING TO OCCURS, AND TO INTRODUCE A LOCAL BOARD GAME.

DESPITE HAVING SOME LIMITATIONS, THE RESULTS ARE POSITIVE.

**CRAFT. UPGRADE. SURVIVE!**

12+

2-4 players

High strategy

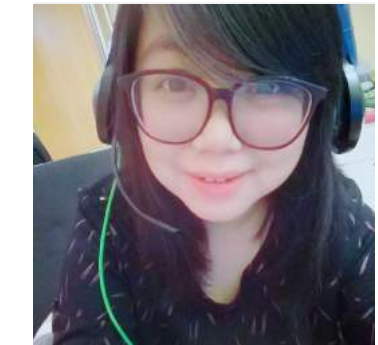
30mins+ playTime

High replayability

## Against the Nature Board Game Prototype

I chose to do this project because I wanted to challenge myself in creating a physical game and how to actually design a game mechanic from scratch.

This project was a good experience despite all the difficult times. Designing an entire game as a gamer was a fulfilling experience because I get to contribute a game for gamer enthusiasts and friends.



**Dayangku Nurul Aqilah  
binti Pengiran  
Haji Emran**

// Aki



*When writing the story of your life, don't let anyone hold your pen.*

### CONTACT DETAILS

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**CREATIVE AND  
INNOVATIVE  
TOOLS**





Muhammad Aminuddin  
Hidayat bin Haji Amir Hidayat

// Amin



*Learning something new  
is never gonna stop me.*

### CONTACT DETAILS

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## Quran E-Learning using Speech Detection (QeSD)

I always thought to myself, what can I contribute to my country in terms of innovation and education. Hence, Quran E-Learning using Speech Detection or in short 'QeSD' was developed.

I enjoyed developing this project. It also gave me the experiences in learning how mobile learning is important to the country. It also gave me the opportunity to learn how voice recognition is implemented to some applications that are already built.

## QeSD

Quran E-Learning Using Speech Detection



### INTRODUCTION

QeSD is a learning application for mobile. It used speech detection program to detect the user voice and convert it to text so the application can compare the text with the pre-program phrases available. This application is developed by using Unity and the targeted build for Android OS.

### OBJECTIVE

To develop a mobile learning application that can detect the user voice using the voice recognition.  
To develop a mobile learning application for learning Doa from the Holy book Al-Quran  
To help the users in term of learning on reciting Doa properly.

### FEATURES

Voice Recognition  
Part by part Doa recitation  
Audio playback recitation of selected Doa

### CONCLUSION

Mobile learning is not just needed in the educational environment, it also needed for the development of the country and the future generation. With mobile learning, users can access the application anytime and anywhere no matter where they are. This application will detect the user voice and convert it to text, therefore it can compare the user voice with the phrases that was program in the application. This application can help with improving the user recitation of Doa.

### FUTURE WORK

Implement the voice recognition for the full sentences  
Addition of more Doa to the list  
Provide Roman translations for each of the sentences  
Addition of tutorial or guide on how to use the application





Khairuddin bin Kiffle

// Chai

SS


*“Creativity is thinking up new things.  
Innovation is doing new things.”*  
— Theodore Levitt

*If you get tired, learn to rest,  
not to quit.*  
- Banksy

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### SMART DEVICE AS A CREATIVE TOOL: WIIMOTE WHITEBOARD



**KHAIRUDDIN BIN KIFFLE**  
BSDM/02/003/14  
Bachelor Science (hons) in Digital Media


#### Overview

Spatial augmented reality and projection mapping allows users to create a projected virtual environment on irregular surfaces. Interactive Whiteboards program: allow teachers and students to manipulate items on a large screen using interactive pen, bringing a new level of interactivity to classroom instruction. The features include drawing, drag and animate the image. The sharing of ideas that occurs from being able to write, sketch and annotate spontaneously in this century digital classroom creates a richer learning experience and can help reach the objectives. The Wiimote whiteboard have abilities to integrating smart devices with teaching and learning.

#### How System Work ?


First step install: Wiimote Software (opensource Project developed by Johnny Chung Lee) or SmoothBoard Software continue developed by Boon Jin.

The Smoothboard Air software will provide an IP address immediately. Connect students' any smart devices to the WIFI network. Students just need to enter the IP address in their browser into their smart devices and lab PCs.



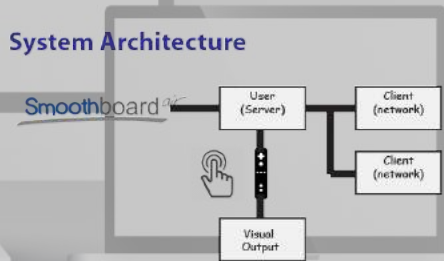
UTB's Apple Lab

#### Setup



(1) Projector (2) Wifi Access (3) Personal PC  
(4) Smart Device (5) IR Pen (6) IR sensor  
(7) Wii Remote Controller (IR Sensor)

#### System Architecture



#### Target Audience

Students identified with learning difficulties on Remedial Education Plans (REP). Especially those who has poor performance in the learning process, however, it is not limited to those students but may be applicable in all student.

#### Future Enhancements

Future research is to examine the teaching and learning by Interactive Whiteboard. The local education institution should implemet the program system.


#### Objective

Set up inexpensive and low cost Interactive whiteboard.


#### Reference

Johnny Chung Lee, Projects -Wii  
BoonJin.com - Boon Jin's Cyber Space

The icon image source by freezpic.com



UNIVERSITI TEKNOLOGI BRUNEI



SCHOOL OF COMPUTING AND INFORMATICS

# Smart Device as a Creative Tool: Wiimote Whiteboard

During Korean Government Invitation Program 2017, I went to visit the Samsung Innovation Museum and I was interested in the Smart Device as a Creative Tool section, so I decided to research this type of innovation technology features which was an amazing discovery.

This project was done inclusive of education learning, and I hope students will find it enjoyable.



Sara Khadhra  
'B' Khalidkhan

// Sar



*Minimalism is complexity  
in its simplicity.*

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## The Creative Deck (Brand in Brief)

The Creative Deck is a creative brief, simplified at your fingertips in the form of a branding tool which helps to figure out your brand identity and media advertising needs. Discovering your brand in an interactive and innovative way.

The Creative Deck is inspired by the drive and motive of supporting the development and creating growth improvement in the local creative industry. It is to introduce an easier interactive approach towards business brainstorming, through the development of a toolkit or service in line with the Wawasan 2035 towards a high quality of life through the enhancement of knowledge, information and art.

It was quite challenging during the development process from the beginning of the brainstorming stage all the way to the execution, as to actually be able to create and bring the idea to life in the best attempt to cover all aspects, not just in terms of design and aesthetics, but as well as functionality which would meet a satisfactory result with quality.

The main aim was to develop a toolkit which enables to collaborate with people and organizations in the communities served to bring quality, learning opportunities and economic development to our region. All while intending to create a conducive environment for development especially through the encouragement of creative and innovative activities.

The overall experience gave a brand new creative buzz with an innovative twist. I feel glad to be given the opportunity to work on this project and it has been great privilege.







# SELF-TRACKAM

SHIQAH NATASYA BINTI DR. HJ MUHAMMAD HADI (BSDM/02/015/14)

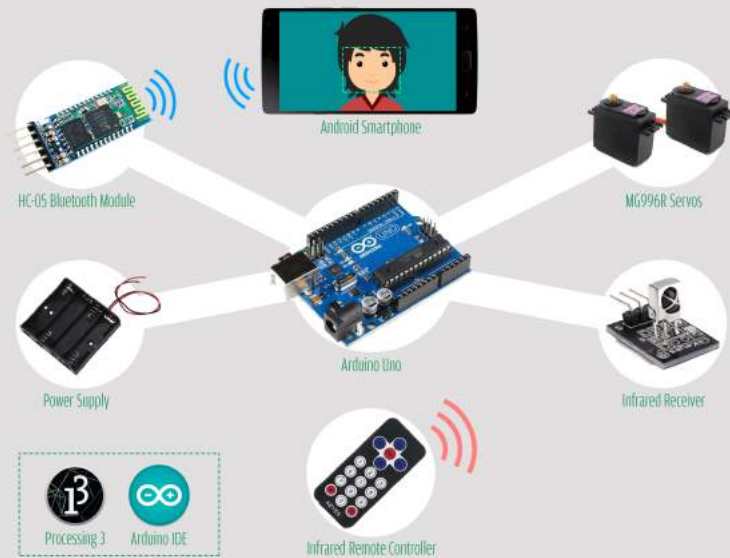
## INTRODUCTION

Self-Trackam is an Arduino-Android based application with face detection and camera tracking implemented for selfies. The process involves a smartphone camera mounted on two servos to pan and tilt that will give it the capability autonomously rotate horizontally and vertically. Facial features are detected and if the target object moves, the program will command the servo to also move so that the face is always in the scene.

Infrared remote control will enable manual operations so user can also manipulate the pan, tilt and frame capture with the press of the buttons.

## AIMS & OBJECTIVES

- To enhance photography experiences via autonomous control by tracking.
- To implement face detection algorithm to a camera.
- To employ a tracking hardware to move the camera in all axis.
- To research on effectiveness of the computer vision process applied on the tracking problem of this project.



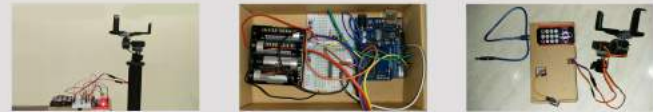
## METHODOLOGY

Computer vision is an area of computer science, mathematics, and electrical engineering. It includes ways to acquire process, analyze, and understand images and videos from the real world to give machine or computer the capability to visually sense the surrounding environment, in order to mimic human vision (Pajankar, 2015).

## IMPLEMENTATION

The Self-Trackam application is approached using the ketal technique. Ketal provides direct access to sensors, camera, and networking hardware by using Google APIs for android. It allows processing sketches to access Android camera through an object modelled after the java processing camera class.

The development of the Self-Trackam system is built using Processing 3 with Java program language that will execute the face detection algorithm. Arduino IDE uses C# language and is tasked with the tracking of the face detected.



## TESTING & RESULT ANALYSIS

Testing was conducted on UTB grounds among the students in testing the face detection, tracking and manual control features of the Self-Trackam application. Results were analyzed from 35 participant's responses in a form of questionnaires after conducting the testing or watching the demonstration video.

Overall, the results analyzed shows that the technology and features implemented in Self-Trackam would likely help enhance photography and selfie taking experience.



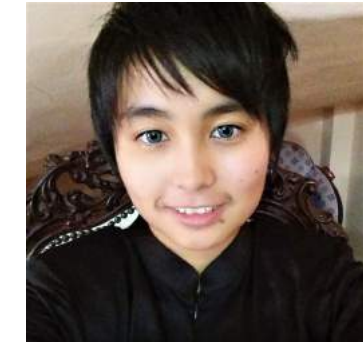
## CONCLUSION

In conclusion, we have delivered a functional Self-Trackam product with face detection, tracking, and infrared manual controls to enhance selfies and photography experiences with tracking hardware such as servos to move in all axes and face detection algorithm to a camera.

# Self-Trackam

Photography has become a way to preserve memorable events of our lives in today's society. Relating to this, I wanted to challenge myself by doing something different, by developing an application/product that can up your selfie game. Also it seems fun and simple to do at first.

A lot of sufferings were involved, as this area of study and technology involved were not within my expertise. *Never again...* However, i managed to complete my project, better than expected so that was cool.



Shiqah Natasya binti Muhammad Hadi

// Shiqah



*If you can't find your motivation, then procrastinate. You'll eventually find it at the end of your deadline.*

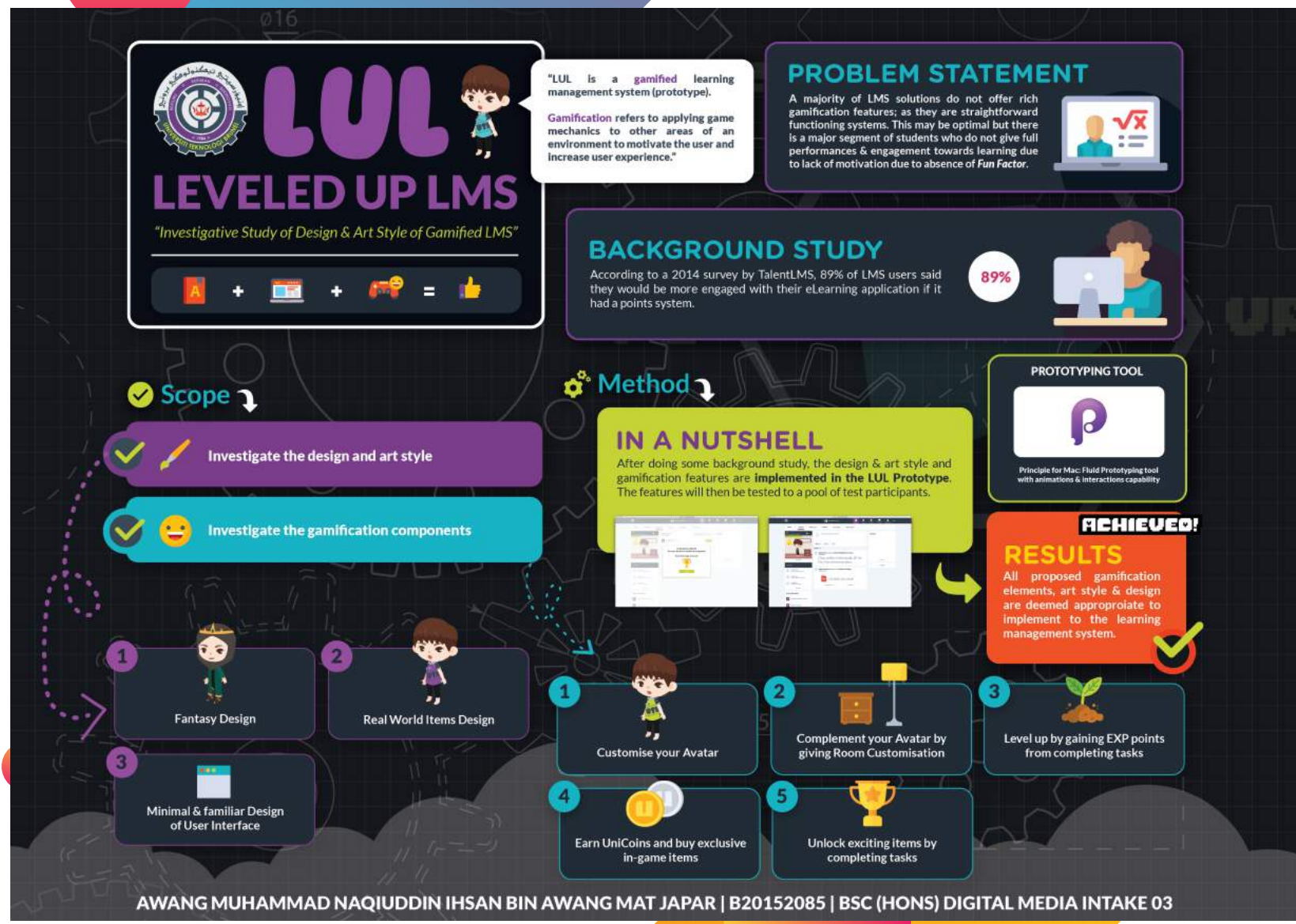
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# RESEARCH STUDY







## Investigative Study of Design and Art Style for Gamified Learning Management System

One of the motivations for me to do this project is my personal interest in how incentive mechanisms help motivate people to do more tasks or activities. Gamification is a way of motivating where a reward is given for every action done. For example, in games, when you complete a certain quest or mission, you will be rewarded with coins or experience points. From several studies, gamification help increase user engagement and improve user performance. I like how reward mechanisms can help motivate individuals no matter how micro the actions are.

Overall, I enjoyed the process of the project development. The initial phase(s) were quite rough and blurry. It taught me how to improvise and devise new methods to meet the project's objective -- There is no one way of completing a task.



Awang Muhammad Naquiddin Ihsan bin Awang Mat Japar

// Ihsan



*Don't wait for opportunities. Create them.*

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