Topics on the theme of
**Visual Information Processing /
Visual Big Data /
Games & Mixed/Virtual Reality**

FYP Project Briefing

16 Feb 2016 @ AR4004 Lab

by Albert Quek / John See / Wong Lai Kuan

Pic2PolyArt: Transforming A Photograph into a Polygon-based Geometric Art

Dr. Wong LK

- Design and implement an algorithm that automatically transform a photograph into a polygon-based (eg. hexagon) geometric art.

- Create a simple prototype that allows users to modify the abstraction parameter to obtain personalized results.

- Note: Extension from this year FYP, **Pic2Geom** project.

AmazeScapeII: Transforming an Unappealing Landscape into an Amazing Landscape

Dr. Wong LK

- Identify image enhancement techniques commonly used by professional photographers to enhance landscape images.

- Design an algorithm that analyses the shortcomings of a landscape image and automatically selects and applies the appropriate image enhancement techniques to increase aesthetic quality of the landscape.

- Note: Extension from this year FYP, **AmazeScape** project.

StylePortraits: Style Transfer for Portraits

Dr. Wong LK

?

- To design and develop an algorithm to transfer the tone and style of a artistic / professional portrait to a photograph.

- To create an application that implements the proposed algorithm and allow users to choose a style for the algorithm.

LightUpMilky: Transforming a Low-Light Image into A Milky Way Image

Dr. Wong LK
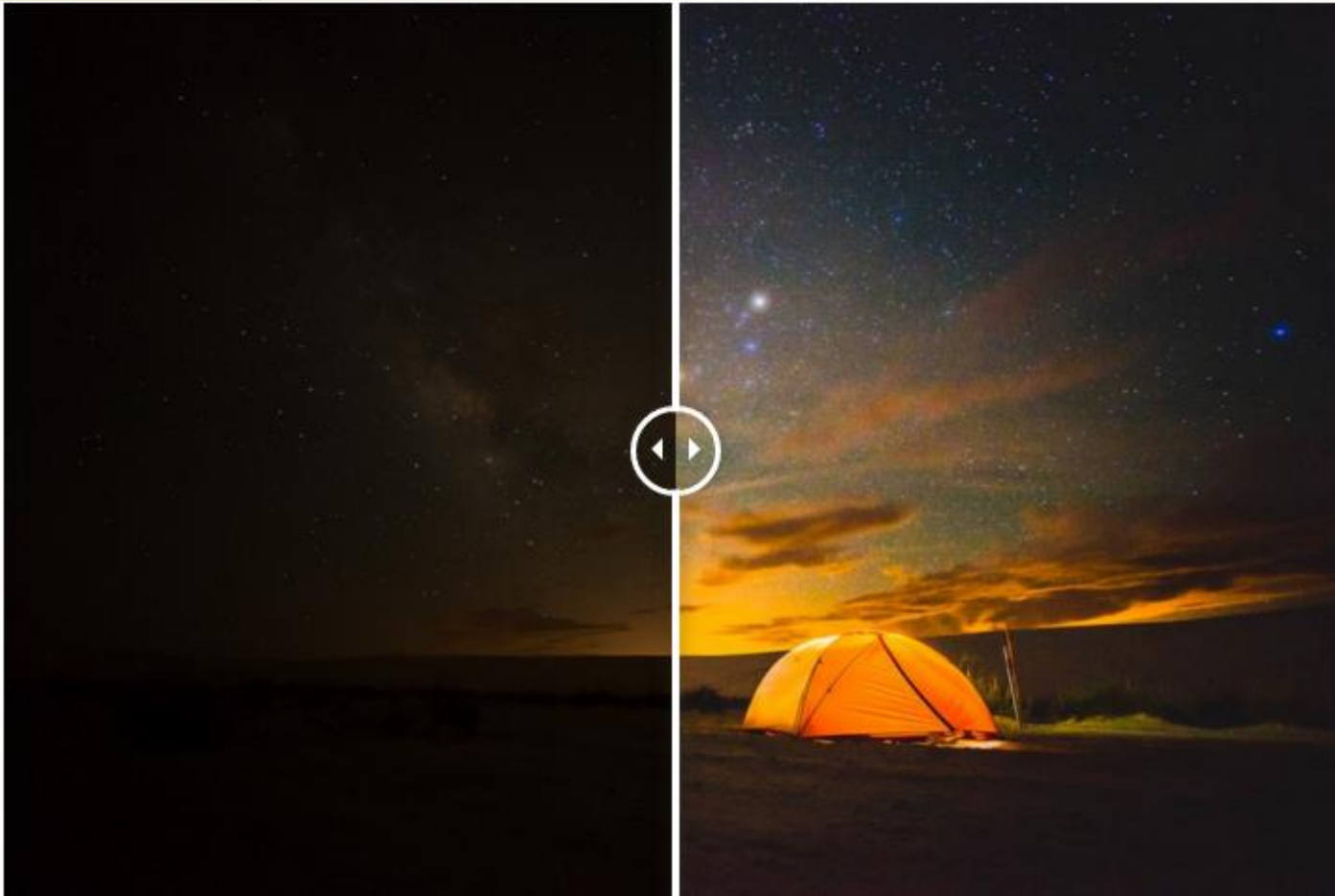
- Identify image enhancement techniques used to transform a low-light / underexposed night image into a milky way image.

- Design an algorithm that automatically selects and applies the appropriate image enhancement techniques to transform a low-light / underexposed night image into a milky way image.

Image2Emo: What Emotion Does This Image Gives You?

Dr. Wong LK

- Identify features of an image that arouse certain type of emotion usch as anger, fear, excitement etc.

- To extract features from an image to train a classifier to identify the emotion generated from an image.

CulturalAesthetics: Influence of Culture on Aesthetics Perception
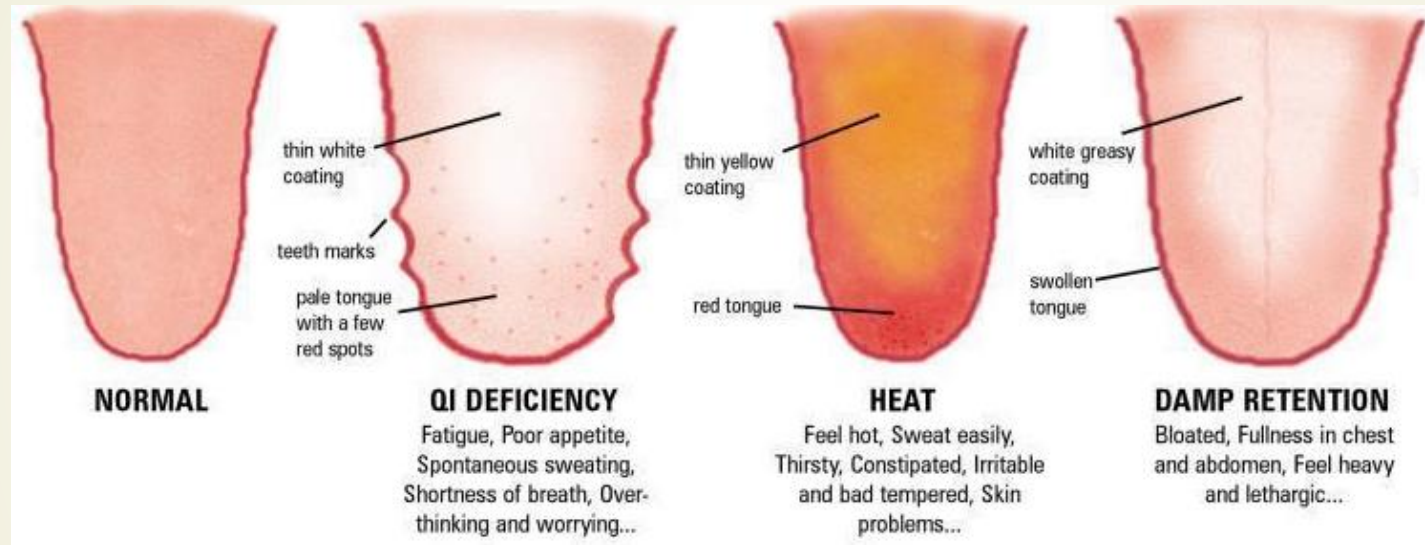
Dr. Wong LK

- Extend the AVA dataset to include culture information (location of the photographer)

- Train a computational model to identify the aesthetics preferences of people from different culture.

MobiTCM: Mobile Tongue-based TCM Health Detector

Dr. Wong LK

Which tongue are you?

- To improve existing image-based algorithm (s) to enable health analysis of tongue images captured with mobile devices.

- To develop a mobile app that implements the above algorithm to enable anytime-anywhere health analysis to be carried out.

Cal-logs: Automatic Calorie Logger based on Food Photos

Dr. John See

520 cals

"You have been consuming over your dietary intake limit for the last 3 days!"

- To estimate the amount of calories consumed by the user from meals throughout the day, just by processing and interpreting food photos captured.

  - Track amount of calories consumed over a longer period of time (weeks, months),

  - Tell eating habits, recommend healthy suggestions

- Note: Extension from past two years' FYP, **Foodtags** project. Top-1 accuracy of 68% and a top-5 accuracy of 93% for recognition of Malaysian food.

Skimlets: Finding Interesting Moments in Visual Lifelogs

Dr. John See
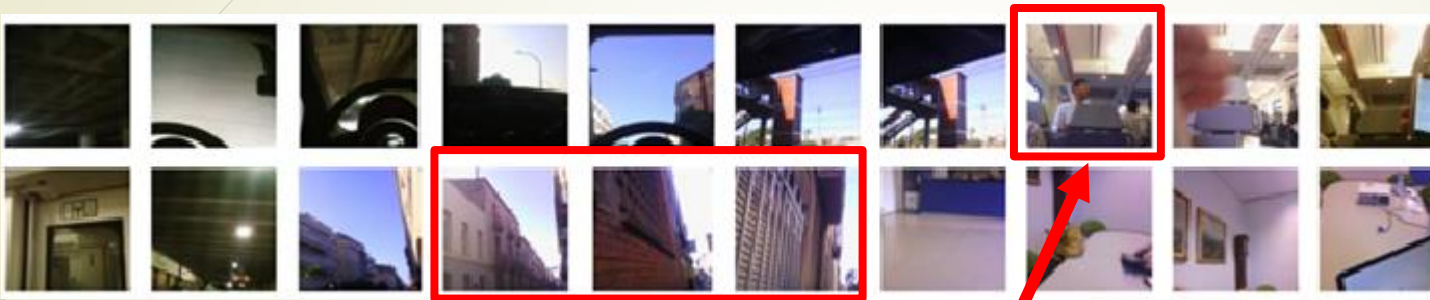
Interesting place I went

Interesting person I met

- To find interesting moments from images captured daily from wearable cameras to construct short snippets/sequences called "skimlets".

- "Skimlets" can consists of interesting people the user has met, interesting places the user went, or interesting events that the user experienced.

- Note:
  - Extension from this year's FYP, **LifeLog** project.
  - We have a Narrative Clip 2 (tiny, wearable camera) which you can make use to collect visual lifelogs!

Selfr: Recommending Better Selfie-taking

Dr. John See

Aesthetic score: 6.5 / 10
Popularity: 4.5 / 10

Tip: Face needs to be lower

- To design a solution to post-recommend how a selfie image can be better taken to improve its <u>aesthetics</u> (beauty) and <u>popularity</u> value.

- Output can be in the form of textual recommendation: e.g. "picture too dark", "face needs to be higher", "too much clutter in background", or image recommendation.

- Note: Extension from this year's FYP, **Comfie** project.

Video2Trailer: Generating Trailers from Long Video

Dr. John See
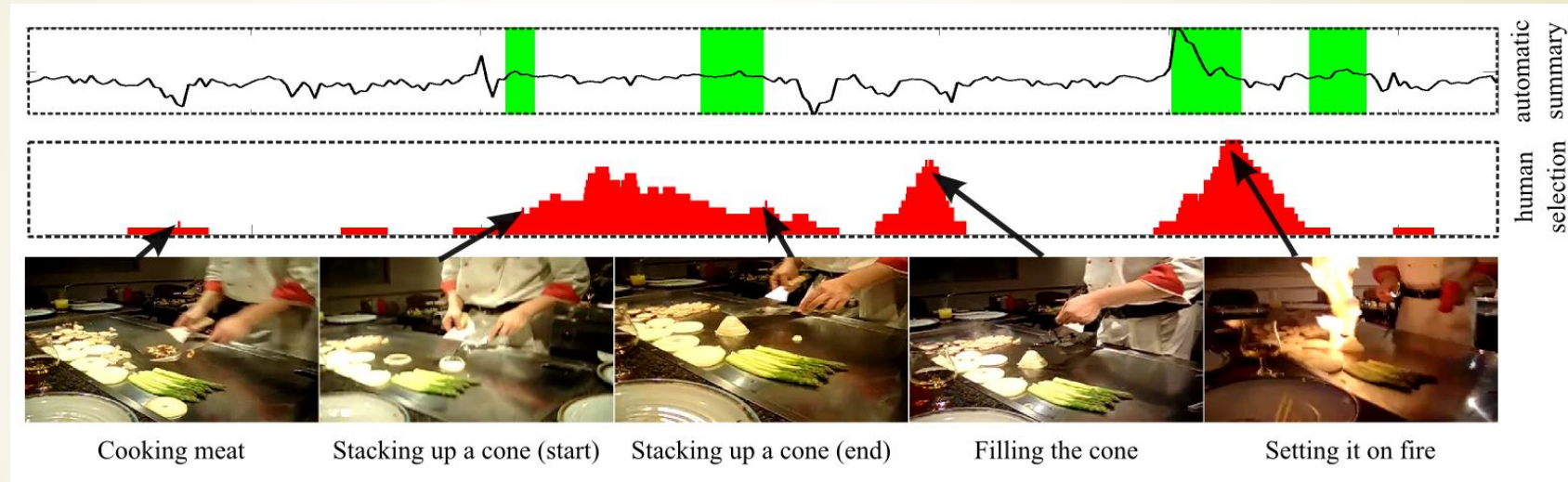
- To generate trailers from long video clips.

- One way to do this is to look for portions or "shots" from the video that indicate some form of "interestingness" that warrants keeping.

- Subjective task of knowing if the trailer is good → a proper user study or benchmarking should be conducted to verify the capability of the method

Visual Fashion Analytics: Finding What's In Trend

Dr. John See

LOS ANGELES, CA
466 FANS
288 VOTES
62 FAVOURITES

TAGS
CHIC
EVERDAY
FALL

COLOURS
WHITE-BOOTS

NOVEMBER 10, 2014
GARMENTS
White Cheap Monday Boots
Chilli Beans Sunglasses
Missguided Romper
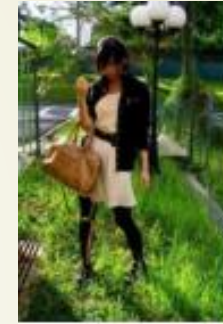Daniel Wellington Watch

COMMENTS
Nice!!
Love the top!
cute
…

IN TREND   ✓   ✗   ✗

- To discover the type of fashion that is currently in trend by processing both visual and meta-information from various social network sites such as Chictopic and Pinterest.

- These sites also offer "votes" and "pins" → useful to find out what clothing items are most fashionable in specific countries and cultures.

  - Optional: Recommend fashion articles that are in-trend for outfits that are clearly unfashionable.

Parvis: Visualizing Data Analytics for Carpark Surveillance

Dr. John See

- To produce neat and intuitive data visualizations of various semantic information extracted from carpark surveillance footages.

- Semantic information are such as enter and exit parking lot times, number of cars per hour, time taken to find carpark, parking duration, etc.

- We have at hand, 7-8 months worth of carpark video data (5 days/week, 10 hours/day) captured from MMU carpark to build these visualizations!

Preparation of Visual Processing / Visual Big Data FYP Projects

DIP / CV Reading Materials / Tutorials

- UCF Computer Vision Video Lectures 2012
  https://www.youtube.com/watch?v=715uLCHt4jE&list=PLd3hlSJsX_Imk_BPm
  B_H3AQjFKZS9XgZm

- OpenCV

  - OpenCV (with C/C++)

    http://docs.opencv.org/2.4/doc/tutorials/tutorials.html

  - OpenCV-Python

    http://docs.opencv.org/3.0-beta/doc/py_tutorials/py_tutorials.html

- Matlab Tutorials / User Guide
  http://www.mathworks.com/help/pdf_doc/images/images_tb.pdf
  http://www.mathworks.com/help/images/getting-started-with-image-
  processing-toolbox.html

- Computer Vision: Algorithms and Applications (E-book)
  http://szeliski.org/Book/
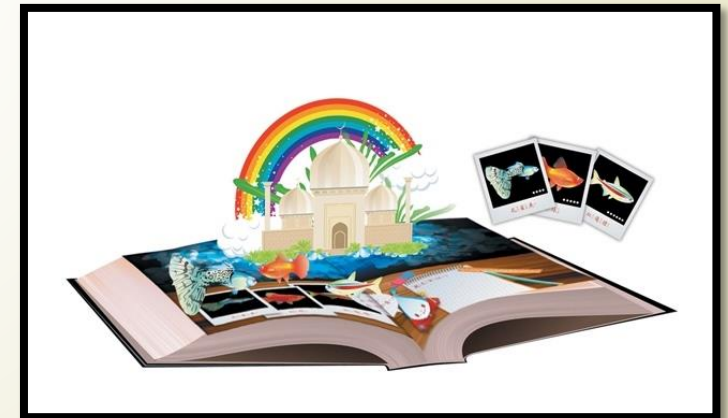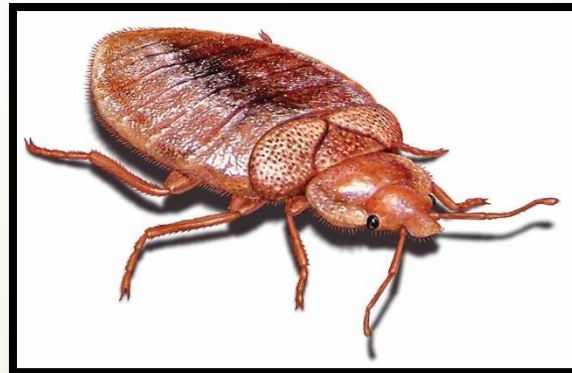
WHEN GAME MEETS WEARABLE, AR and VR

Mr. Albert Quek

Augmented Reality Serious Game using Smartphone

This project requires students to explore the application of Mobile Augmented Reality (AR) technology and designing a serious game in the area of
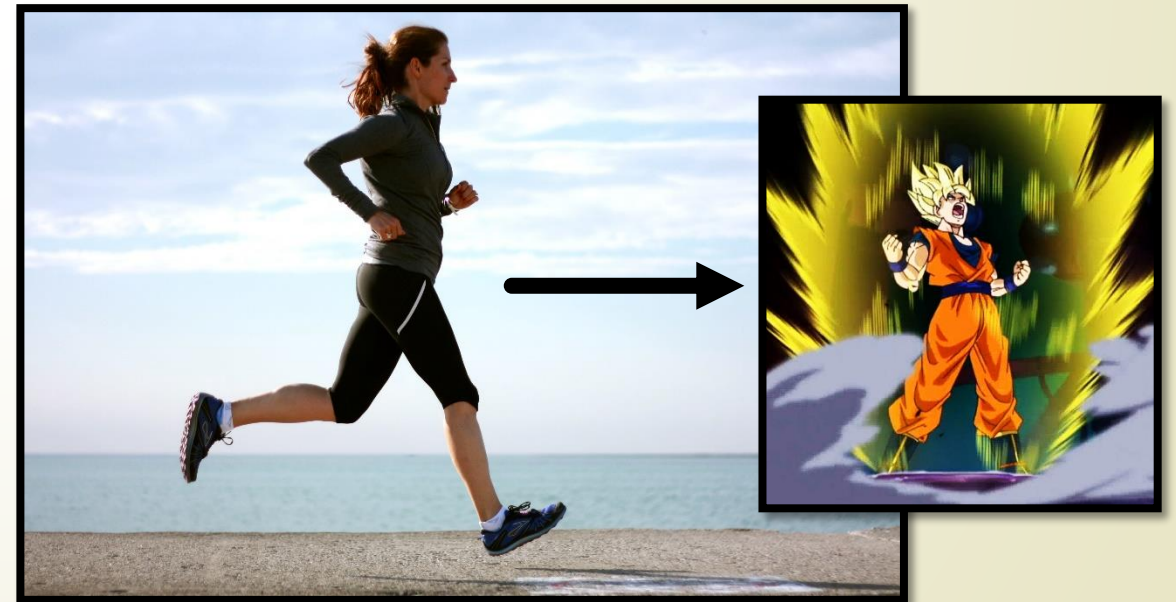
➡ treatment of phobia to cockroaches

➡ interactive Story to promote social skills for Autism children

➡ Etc.

Lifestyle Game for Smartphone

This project requires student to explore the application of wearable fitness tracker, accelerometer and gyroscope for mobile games. Your focus can be as followed;

- Fun Gameplay
- Physical Exercise
- Endurance Exercise

Gesture-based Game for Visual Impaired Individual using Kinect

This project requires students to research on game design techniques and methods that are able to help visual impaired individuals to be able to experience gameplay without having to rely heavily on game visuals.

Gesture-Based Game Mechanics for First Person Action Game

This project requires students to explore the application of Kinect/Leap Motion in Game and designing First Person Action game-play suitable for a specific target audience.
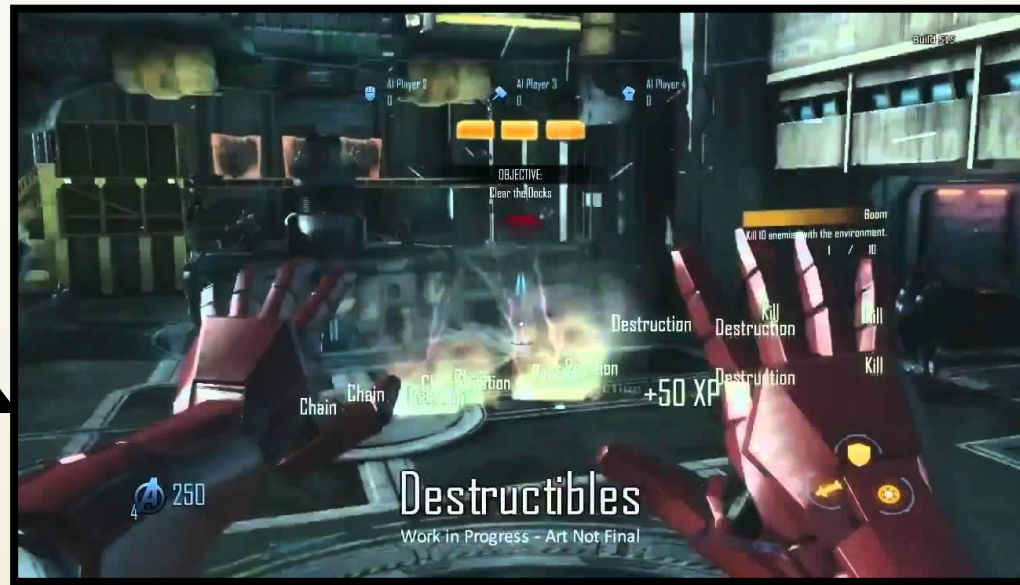
Virtual Reality Android Based Game

This project requires student to explore the application of virtual reality, accelerometer and gyroscope in android devices. Student has to design a VR gameplay using accelerometer and gyroscope or any special input devices for the following area;

- ► Exploration (Flow)
- ► Experimental Gameplay (Mario Galaxy)
- ► Etc.

Experience based Virtual Reality Game

This project requires students to explore the application of virtual reality, accelerometer, gyroscope and physical devices(hardware) in creating an enhanced virtual reality experience. The applications are as below;

➡ It can be the mixture of physical action (walking) and …….