YOOBEE COLLEGES

IN-HOUSE STAFF RESEARCH SYMPOSIUM 2020

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FOR RESEARCH SYMPOSIUM 2020

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1

Interpreting Neural Oscillations through 2D Effects Animation

Animation Lecturer, Rafael de Leon

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School of Animation

Neural Oscillations is a scientific term for brainwaves. They are rhythmic or repetitive patterns that are projected by neural activity. Depending on the activity, there are different patterns for specific activities by the brain. Neural Oscillations will differ from someone sleeping, compared to someone participating in strenuous activities. My goal is to interpret an abstract animation of Delta, Theta, Alpha, and Beta waves in the form of traditional animation through digital means, portraying the interpretation in a music video. The music video will portray neural oscillations generated by emotions of various people commuting from work to home inside a subway. The research of the Neural Oscillations or brainwaves of people with specific moods and emotions will help me portray a visual aesthetic interpretation of specific moods of characters in the music video.

2

An investigation into using Emerging Disruptive Technology in the form of Mixed Reality to facilitate Teaching the History of Early Polynesian Migration to the Primary School Students in New Zealand.

Animation Lecturer, Priyan Jayamaha

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"We are history, past, present, and future. Our past informs our future and helps us see our part in the present. We acknowledge the actions of our ancestors and use them to inform future decisions. We cannot change history but we can shape the future and our own behaviors as a result of historical events."
(Ministry of Education., 2019)

With the decision taken by the Govt. of New Zealand to introduce New Zealand History as a compulsory subject for primary and secondary schools by year 2022, new challenges could be faced by the teachers when teaching history to primary school students.

This project is an attempt to explore the possibility of the use of games and technology such as Augmented Reality (AR), Virtual Reality (VR) and to make history lessons more effective and enjoyable for both teachers and students. The internet, smart devices, apps and games have a big impact on education and how we learn and teach. Emerging technologies such as interactive media, games, AR, VR have their unique way of presenting information and storytelling through interactivity and immersion.

In Phase 1 of the project the researcher made an attempt to obtain the following information regarding the use of technology in the learning/teaching process:

- The attitude and opinions of teachers in the use of technology in classroom teaching.
- Present use of technology in learning/ teaching process.
- Availability of digital devices for students and teachers to support teaching and learning.
- Proficiency of technology of the teachers and students.
- Understanding the Early Polynesian Migration and the school curriculum related to the subject.

The research was conducted using the instruments such as interviews and online surveys using practicing teachers from various schools as samples.

The findings will be used, in the Phase 2 of the project, in the development of a board game integrating AR/VR to facilitate learning/teaching History (Early Polynesian Migration) to the Primary School Students in New Zealand.

3

Modern Myth Making: An experiment in developing a contemporary creation myth for modern cultural definitions.

Animation Lecturer, Raymond McGrath

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School of Animation

A study investigating the proposition that a contemporary myth can be developed using Epeli Hau'ofa's vision of Oceania as a definition of the culture this myth would serve. Once a definition of myth and its connection to culture is explained, a brief description of Honko's mythic criteria and Morales Mythic-Logos theory is provided as a foundation. An examination of Levi-Strauss's structural theory, traditional mythologies of the South Pacific and Biogeographical science is identified and applied as justifiable components of Oceanic myth. From these, a proposed creative framework from which a myth could be built for this culture is developed and concludes that Hau'ofa's Oceania vision is a relevant definition of culture. Therefore, mythology may be required to establish its cultural identity for Oceanians, and that a contemporary myth can be created for, and accepted by this culture - provided specific elements are present within its narrative. It is then discussed the opportunities this approach creates for others wishing to develop mythic stories for modern cultural definitions.

The study is a work in progress and will be presented as an introduction to the concept of myth making in media for the modern creative. A presentation of the experimental animation work that accompanies the theoretical frameworks may also be shown as an example of how the concepts presented can be applied practically. Recognition of the many contrasting mythic theories will be briefly considered and discussed in conjunction with observations around limitations and contradictions both academically and practically.

4

Graph-based recommender systems challenges and road map

ICT Lecturer, Tung Nguyen

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School of Technology

Collaborative filtering is an important branch in recommender systems research with huge application in e-commerce and other online trading platforms. In the narrow sense, it is a method of making automatic predictions (filtering) about the interests of a user by collecting preferences or taste information from many users (collaborating). From that, a recommender system can suggest the most suitable items/services for the user.

As Deep Neural Networks (DNN) have demonstrated their superior performance in several areas recently, DNN-based Collaborative filtering has also gained significant momentum. Several proposed models using DNN has been proposed, such as Neural Matrix Factorization (NeuMF). Nevertheless, these early approaches such as treat each user-item interaction as separate data and thus overlook the intrinsic relationships among data instances.

Inspired by the discovery that the autoencoder architecture can force the hidden representation to capture information about the structure of the graph data, in this work, we propose a novel framework called Graph Autoencoder based Collaborative Filtering (GACF) that enhances the classic NeuMF framework with autoencoders for capturing latent high-order connectivity signals in the user-item interaction graph. Two sets of autoencoders, one set for the users and the other for the items, are used to cater to the bipartiteness of the graph. All the autoencoders in one set share parameters so increasing the number of autoencoders does not increase the model size.

We have conducted extensive experiments on two popular public benchmark datasets and the overall comparison results demonstrate the advantages of autoencoder-based methods and show that our framework outperforms some state-of-the-art DNN-based collaborative filtering approaches such as NeuMF and NGCF. Further analysis demonstrates how better prediction performance can be achieved by increasing the depth and breadth of the user-user and item-item interactions in the framework. Source code will be available on GitHub with the publication of this work.

5

A novel approach to personalized web api search through query reformulation and Service Recommendation

ICT Lecturer, Pinal Shah

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School of Technology

Objective: Primary research objective and interest is that the most important topic “Recommendation System” investment for the next decade would be in the management of vast amount web api stored on web platform and make user’s browsing and selecting experience healthier. Try to change the traditional way of choosing right API for finding the relevant tasks and apply some new technique through which user can organize, manage, and make sense of relevant web api easily by developing social network for api. Further my plan is to continue research after my PhD, as a faculty in academia.

Research Area/Domain: Machine Learning and Deep Service Recommendation in the domain of Web API

Research Problem: Programmable web api search engine is following the principal of probabilistic ranking which states that users are trying to find relevant api from the collection of web api. The working hypothesis is the probabilistic ranking principal –api in a results list should be ranked in order of most probably relevant to the user, to least probably relevant to the user. But for programmable web search engine its necessary to diverge from this principal because of the multiple rank orders and categories are present like “By Category, By Protocol, By Platform and most recent”. So, there is need of proposing new technique to improve the quality of programmable web api search engine and making user’s browsing experience healthier

6

Personal Augmented Reality Interior Design Assistant (PARIDA)

ICT Lecturer, Ranju Raveendran

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School of Technology

Personal Augmented Reality Interior Design Assistant (PARIDA) - a guided interior designing application with the help of Augmented Reality (AR).

Interior design is based on the interaction between the person living in the space and the building. It includes a multitude of decision making such as colour choice, choice of door handles, look and feel of areas where people touch, general traffic in the house, light and airflow and even acoustic conditions. An interior designer is trained to consider all these factors and design a suitable interior that works for the people living in it as well as taking into account the general layout and size of the house. But not all can afford an interior designer and it is not practical to bring in and try out different home décor into the house and finalise on a suitable one. This is where computer graphics come into play. Latest 3D computer graphics technology such as Augmented Reality (AR) and Virtual Reality (VR) are widely used in architecture and interior visualisation. An AR application that can run on a mobile device will be portable and does not require any special hardware. Even though there are various AR applications aimed to design interiors, researches show there is no guidance system in those applications to help the user to make the decision-making process easier. Only an expert in interior design can choose on what colour to pick that matches the size of the room and what type of home décor to pick and where to place them. PARIDA is an AR application trying to address this issue, that can guide a novice to design quality interiors. It will be beneficial to professional interior designers as well to easily prototype their designs, make accurate judgments before installation. Home décor stores will also find it useful to help their customers to easily decide what product will suit their home best.

Interpreting Neural Oscillations through 2D Effects Animation
A music video project

Phase 2 - Development

1.Ocean Grid

1 tile = 1 day of travel

2. Main island

3. Destination islands

Outrigger Canoe

Polynesian navigators used Outrigger Canoes to sail across long stretches of open sea.These Canoes were carefully balanced and some used wind force to sail. Canoes were built with natural elements, such as wood, flax, bamboo.

Weaving

Coconut leaves, pandanus and flax are used for weaving in Polynesia.Weaving is used to create a wide range of items, such as buskets, containers, mats, fishing nets and traps, footwear, cords and ropes.

Taro

Taro leaves are usually harvested and used in cooking for meals such as lau-lau where meat, pork and fish are rolled and steamed to make a delicious (one) Polynesian meal also the root is pounded to make thick purple paste called poi a food staple in the Pacific Islands

Kumara

The Polynesian ancestors of Maori brought kumara (sweet potato) with them as a food plant when they arrived in New Zealand. The other food plants that people brought from Polynesia did not grow well in the new, cooler country. So kumara became very important

FISHING

Who can catch the BIGGEST FISH

SONY

We Are Oceania

Modern Myth Making: *An experiment in developing a contemporary creation myth for modern cultural definitions.*

Deep learning on Graph data
Challenges and roadmap

Presenter: Dr. Tung Nguyen (Yoobee – BSE)

IN-HOUSE STAFF
RESEARCH SYMPOSIUM

Friday 10 July 2020
1pm-4pm
@
Theatrette,
Level 11, 385 Queen Street,
Auckland

Query reformulation in
Web API
Recommendation
Presented By:
Pinal Shah
Part time tutor/Research Scholar
Yoobee Queen Street Campus
Currently pursuing PhD at AUT in
Computer and Mathematical
Department
IN-HOUSE STAFF

RL
Reply

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Friday 10 July 2020
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Theatrette,
Level 11, 385 Queen Street,
Auckland
All Yoobee Colleges staff
and students welcome
Afternoon refreshments
will be provided
Kathmandu
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TUNG NGUYEN

YOOBEE
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This is to certify that on 10 July 2020
PINAL SHAH
from Yoobee Colleges – Queen Street Campus
participated by presenting their research.

In-House
Staff
Research
Symposium

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IN-HOUSE STAFF RESEARCH SYMPOSIUM

Friday 10 July 2020
1pm–4pm
@
Theatrette,
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Auckland

Staff will be presenting their current research projects and their progress.

All Yoobee Colleges staff and students welcome.

Afternoon refreshments will be provided.