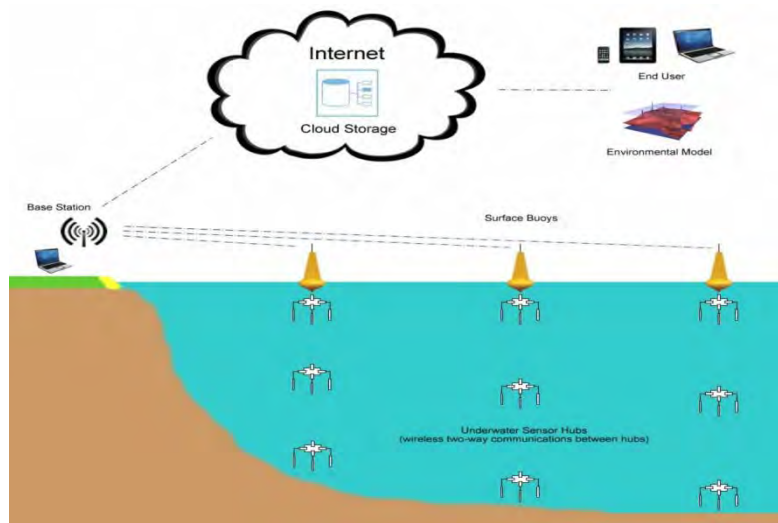


Exploring and Learning about Reef Data in Serious Games

Tim Marsh¹, Jarrod Trevathan², Robert
Donaldson¹ and Ian Atkinson¹

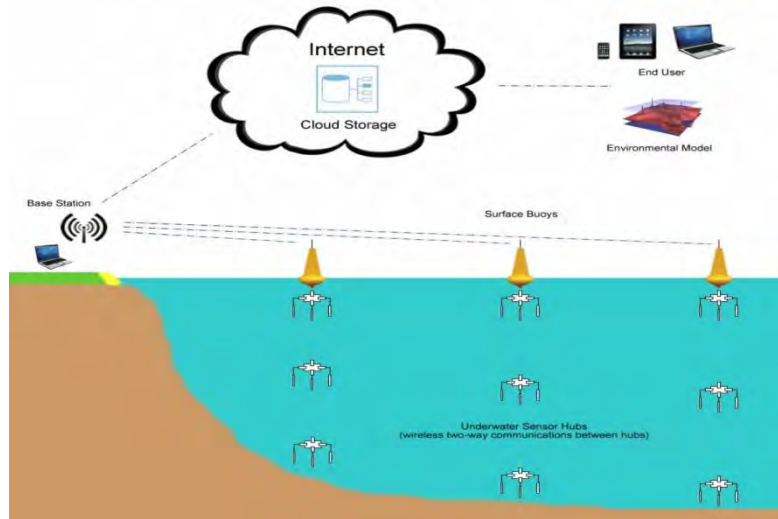
James Cook University¹,

Griffith University²



- system for monitoring aquatic and coastal environments

Smart Environment Monitoring & Analysis Technologies (SEMAT)



- system for monitoring aquatic and coastal environments
- analysis and interpretation of that data into information which can be used for management and planning



Smart Environment Monitoring & Analysis Technologies (SEMAT)

Research: interactive visualization & representation of reef data

- Monitoring & management of coastal regions
 - Expert use
- Learn how sensitive ecosystems operate and raise public awareness about the impacts humans have on them
 - Laypeople & children
- School & Education
 - Digital generation

Serious Games

- games for purpose
 - learn, persuade, raise awareness, well-being...
- use gaming / interactive technologies with rich graphics and sounds
- interact or “play” with the topics of learning
- immerse people in data under study
- used in many sectors such as business, health, and especially in education as a motivational resource for the digitally-savvy generation



Continuum of gameness:

*e.g. mechanics, rules, challenge,
objective, conflict, play, fun...*

video games with
activities for purpose

simulations and
environments for purpose
with fewer gaming
characteristics

experiential / experimental
environments for purpose
with minimal gaming
characteristics

Serious games are digital games, simulations, virtual environments and mixed reality/media that provide opportunities to engage in activities through responsive narrative/story, gameplay or encounters to inform, influence, for well-being, and/or experience to convey meaning.

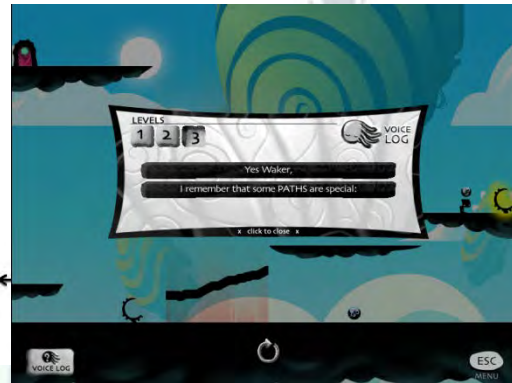
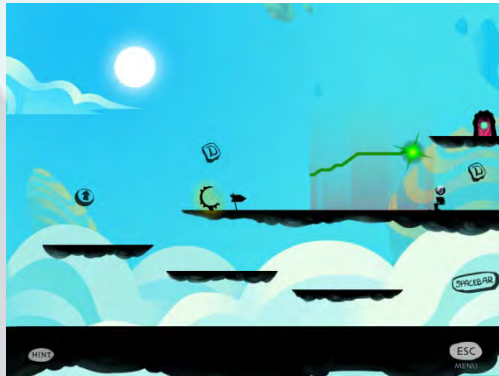
[Serious Games Continuum, Journal of Ent Com, Elsevier, 2011]

game for learning

game for both **Fun & Learning** for students to learn about aspects of **Mathematics & Physics**

Voicelog and Review capabilities for **recall & reflection**

- published R&D and *study results* with High School students (aged 11-14) in Singapore and Boston region, US



collaboration (2009-2011) with The Education Arcade,
MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)



simulation / game

“2020Classroom”: serious game to help undergraduate students learn about human organs – *“fantastic voyage”*



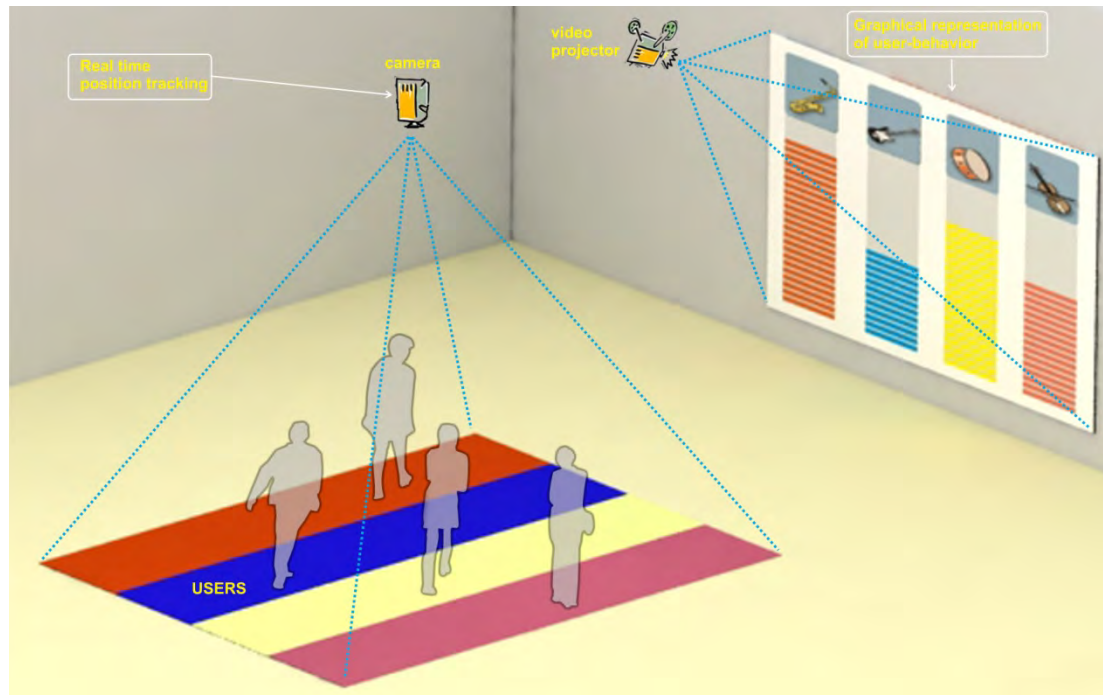
Two learning objectives/missions:

- Nature pumps
 - learn the processes of digestion and absorption of nutrients
- Control systems
 - the roles of glucagon and insulin in maintaining blood glucose levels

mixed media

- Human Music Mixer: music dynamics & pitch

[best paper award ACM SIGGRAPH 2008 Video Games Symposium, Los Angeles, USA, ACM Press].

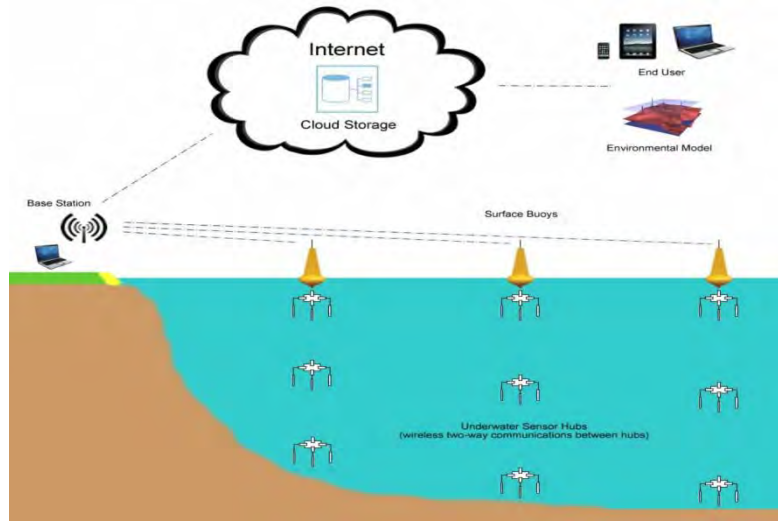


National University of Singapore

experiential environments

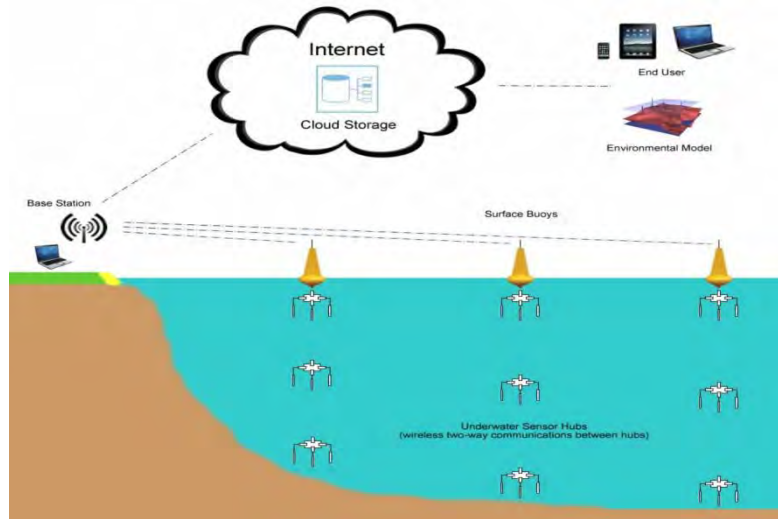
- Baba House: replica of real Peranakan House, experience culture & artefacts in Second life





- system for monitoring aquatic and coastal environments, and importantly the analysis of that data into information which can be used for management and planning

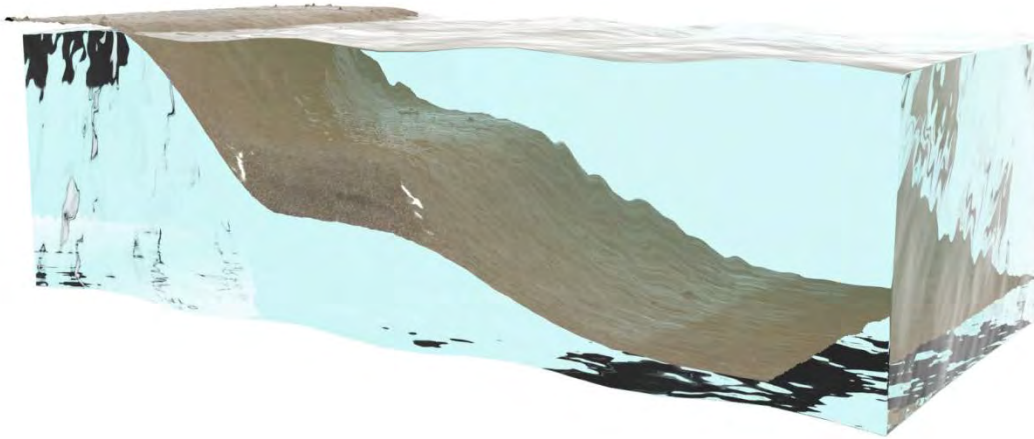
Smart Environment Monitoring & Analysis Technologies (SEMAT)



- system for monitoring aquatic and coastal environments, and importantly the analysis of that data into information which can be used for management and planning
- interactive experience where you immerse yourself in representations and scenarios of reef information

Smart Environment Monitoring & Analysis Technologies (SEMAT)

experimental & experiential environments



- system for monitoring aquatic and coastal environments, and importantly the analysis of that data into information which can be used for management and planning
- interactive experience where you immerse yourself in representations and scenarios of reef information
- for the expert, they are immersed in the information which they interpret
- for the layperson, they are immersed in an interactive experience

Smart Environment Monitoring & Analysis Technologies (SEMAT)

← experimental & experiential environments →

Visualize, simulate, represent, & play with/in typical scenarios and show impacts humans have on the reef



Smart Environment Monitoring & Analysis Technologies (SEMAT)

← experimental & experiential environments →



**Smart Environment Monitoring &
Analysis Technologies (SEMAT)**

← experimental & experiential environments →



**Smart Environment Monitoring &
Analysis Technologies (SEMAT)**

← experimental & experiential environments →



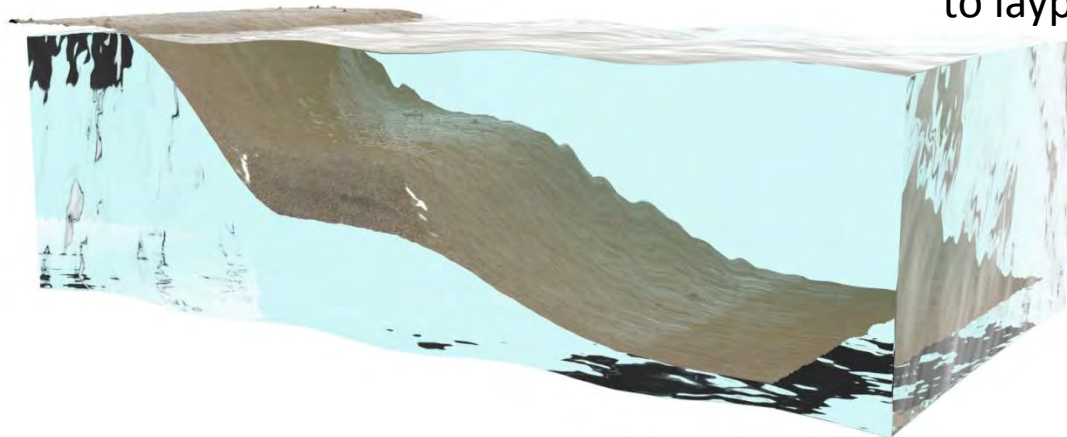
**Smart Environment Monitoring &
Analysis Technologies (SEMAT)**

From games for purpose to experiential environments



Current / Future Work

- Exploring the whole range of serious games: reef data
- From games for purpose, simulations, interactive installations to experiential environments
- For use in labs, schools, museums, etc.
- For everyone, from experts, to laypeople to children



Thanks!

tim.marsh@jcu.edu.au
www.seriousgames.sg