Exploring and Learning about Reef Data in Serious Games

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- system for monitoring aquatic and coastal environments
• 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 both Fun & Learning for students to learn about aspects of Mathematics & Physics

Voiceelog 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)
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

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

simulation / game

IMSC & InfoLab, University of Southern California
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

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

Smart Environment Monitoring &
Analysis Technologies (SEMAT)
experimental & experiential environments
experimental & experiential environments
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!

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