Dark Lancaster

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position paper for Interact 2005 workshop on "ABUSE the dark side of HCI"

In this position paper we'll outline a few ongoing and planned projects at Lancaster that are not all sweetness and light. In some we are interested in some of the darker aspects of human nature: frustration when things go wrong in order to design games with the right emotional impact; and anger of those seeking jobs in order to help train those who need to defuse fraught situations. In others we deliberately seek to design 'bad' situations; pbviously this is necessary to study issues like frustration, but also we design bad things in order to understand what is good! Finally, there are times when good is dark and the bright light of day needs to be shrouded just a little.

Frustration

Slowly you edge down the dark corridor, distant daylight dimly illuminates the walls on either side, your heart races you know there are others in these corridors and they are after you. You near the bend. What is beyond? Too late you wheel round only to be momentarily blinded by a bright light, then you hear a pistol crack and see the ground race towards you, already red with blood, your blood. Game Over.

Video games are escapist, virtual, just a game, but in the heat of the moment the emotions can be very real.

Research on affective gaming seek in various ways to understand, measure or infer the emotions or more normally simply arousal of the gamer in order to adapt the game and create a more engaging, more immersive experience.

Early work used heart monitoring to measure arousal and create a game that modified the level of challenge accordingly, low levels of arousal led to more enemies attacking, although easier to kill ones in order to maintain the same level of difficulty.

More recently we've focused on frustration, both the 'proper' frustration when you get shot by a cleverer opponent for the 10th time, but also the frustration when a moments delay in the controller means you can't duck in time.

Of course to study frustration we need to create games that cause it :-)

See refs: [4] & [5]

Cruel Design

We grow up in the real world, physical things that respond to gravity, bump into each other, have weight, solidity, stay where they are put until moved. Then we move into the electronic world whether virtual reality or simply a desktop interface. Things are no longer so simple and the laws of physicality breakdown: there are delays between action and effect, things change without apparent agency, it is a world of magic and not a little superstition.

We wish to understand the ways in which design can recruit our natural understandings of the natural world to create better tangible interfaces and ubiquitous environments. Some of this we can find by examining existing artefacts, mining the implicit knowledge the designers invest in these. This has enabled us to produce putative design guidelines, but there is only so much you can learn from good design.

In neurology it has been the freak accidents and illnesses, skull fractures and cancerous growths, that have revealed much of the structure of the brain. It is when systems fail that we begin to understand how they succeed.

So we look towards cruel design, experiment on systems designed to be strange, hard, annoying or simply impossible to use. By manipulating the level of physical coherence of physical-digital mappings we are delving into the properties that make things work well by making them work badly.

See refs: [2] & [3]

Anger

In a government office a client comes in - of course in an increasingly corporatised public service everyone is a customer. The client is a citizen or perhaps wouldn't use that term, perhaps just a frustrated person with a problem that needs sorting: benefit not paid, bills piling up. You are behind the desk - what are you going to do about it? What do you say? You can't access it on your computer; it's not your responsibility; you want to send me to another office. I don't care about your computer or your responsibility, I don't want to go to another office - I need my money, and I need it now.

Abuse, violence and emotional turmoil are a day-to-day part of many 'front line' public services. How do you train people to deal with traumatised, angry, upset clients? Training videos will often show scenarios: how to defuse potential problems - how to say the right thing in the right way. Some of this is about what you say, but a lot more about how you say it; when you can't help you need to be helpful.

We are planning to start a new strand of work, building on previous systems including the affective gaming and several arts-technology installations, to produce virtual avatars that can respond in emotionally realistic ways to detected emotions in the user. Can you soothe the angry avatar before there is bloodshed in the office?

See refs: none yet, only just starting!

Underside

You pace nervously in the gloomy hall. Daylight barely filters into this deep dark place. Far off you see another person glancing up and down. What is he thinking? What is he waiting for? Something in the way he looks at you makes you twist round, only to be momentarily blinded by the flash of lights. You hear the dull thud and hiss of air-brakes and the door opens in front of you. "A return to Lancaster please". And the other figure in the darkness? He must be waiting for the number 42.

Beneath the central square in Lancaster University there is an underpass where the road cuts under the very heart of campus. The buses stop here and passengers loiter. In this, the underbelly of campus, one of the first phases of a eCampus is being deployed, a project to infiltrate the whole of Lancaster University campus with interactive public displays and sensors.

While passengers wait three projectors turn the opposite wall into a huge display, mobile phones are used to interact with the displays so that they go beyond mere 'next bus' signs to an immersive experience submersed beneath the feet of unknowing passers-by in the square above.

As befits this subterranean world content in the underpass will have a subversive edge to it including performance art and interactive applications. An artist in residence is preparing the first installation now.

See refs: For general performance related work [1] & [7], but the underpass itself is still in progress (opening 1st October 2005), so no papers yet!

Reflection

Looking at these examples we can see three types of 'badness':

(i) things that are bad but we want to study (perhaps to alleviate them)
(ii) situations where a little bit of badness is good ;-)
(iii) using difficult or bad situations to understand what is good

The first project on video game frustration has all of these aspects. (i) If the game is just not fluid enough, or if the puzzles or physical actions are too difficult, the gamer will become frustrated and stop playing. So we want to know whether we can use physiological signals to detect this and perhaps give the gamer hints to help. (ii) Of course in a game a level of frustration is right, we don't want it too easy!! (iii) To study both the bad and good frustration we need to create games that are deliberately frustrating!

The second project on cruel design is focused almost exclusively on the last aspect (iii). We want to create designs that are good and exploit natural physical understanding and abilities, and we are creating mappings that are bad in different ways to understand what is good. This is in fact being done partly in conjunction with the gaming project creating small video games but where the mapping between controllers and their effects obeys different physical-digital properties. In some cases

we will have mappings that are easy to understand in your head (e.g. right hand joystick is 'increase something' left hand is 'decrease something' and each joystick movement controls the thing at the relevant location on the screen. In others this mapping will be odd and hard to remember (or even dynamically changing!), but the joysticks will have a 'natural inverse' property – pushing the *same* joystick in the opposite direction has the opposite effect.

As noted the study of deficient or unusual behaviour is a common method in many areas. For example, Ramachadrin uses phantom limb sufferers to study 'normal' brain function and synesthesia to understand metaphor [6]. Sadly in human–computer interaction researchers (and reviewers) find it hard to comprehend the deliberate design of bad interfaces! We clearly need a change in culture within our discipline, as we seem to confuse good design and good science. Although the end points are often similar the routes and methods often diverge.

Moving back to dark Lancaster, the 'anger' project is only just beginning and here we are interested partly in the training aspects (i) and of course for this will have to simulate bad situations – in this case using virtual angry avatars (iii). However, the deeper lesson we want to learn is about the nature of emotionally reactive avatars whether dark or light emotions! The aim is to move away from the angry clients and eventually look at emotionally reactive virtual dance partners. One question we have is whether onlookers or dancers can tell the difference between real dancers (portrayed virtually using body movement sensors) and virtual ones – a sort of emotional Turing test!

Finally the underpass project is solely related to (ii) the positive aspects of slightly dark emotions. Just like frustration in the video game a certain amount of 'bad' emotions are a good thing; this is why we have them. Without subversion there would be no change.

References

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