Echoes meeting: 21st February 2007 Dundee

1. Viewing of short film on Autism

2. Introduction by Kaska – will start with task; other topics. Goal for day is to ground issues and aim for failry clear idea of what it is tat we are proposing with concrete research questions, assumptions, hypotheses and findings.

Oliver – what is status of pilot studies that were in the proposal?

Karen – we need to decide exactly what we are going to do before taking this further.

Kaska: possibility of using Luke Jackson as researcher with study of interaction and involving young people with Asperger's syndrome in scoping what games they like.

Karen: propose that we actually write such participatory scoping studies, with representatives of the target group, into the main study.

Wendy: Jackie and Luke Jackson are very articulate presenters of the issues related to autism, and we would like to approach them once the task is clearer.

Task proposal:

Genaro: to keep simplicity with the environment, based on comments on the environment, propose task of:
Child in front of projection. Projection is intelligent agent and robot.
Task is for child to teach robot to be more human.
Issues: how to recognise and react to emotions.

Two communication systems:

1. intelligent agent and child collaborate: agent helps child, social interaction between agent and child.
Q1: what kinds of interactions would we address between child and agent

2. Interaction between child and robot: promotes reflection by child in process of teaching robot, and also promotes reflection between agent and child.

So some of education is hidden in interaction. Lots of assumptions and questions (both technical and theoretical).

So do we like this idea?

Oliver: likes part of it, some problems.

Goal of robot wanting to be more human is very abstract for human. Also triangle of interactions: humn child does not get to see their own communicative responses. So what if avatar representing the child – but can observe themselves in the avatar, see own expressions in agent and do problem solving.

Kaska: alternative is child may be embodied in another agent that interact in the same task.

Tim: think of robot as embodiment of child?

Oliver: get rid of robot and make this direct model.

Wendy: already been done by Kirsten did work on getting robots controlled by child – in Hertfordshire? Paola. Jackie Jackson appalled by child learning emotions through robots.

Annalu: maybe good idea to expand beyond one-to-one with computer. Reactive colours provides additional characteristic.

Wendy: because of RC simplicity the users are not being overloaded by whatever is on screen.

Kaska: thinking about RC a lot, but see aim as we control it a bit more: would likeo t see more collaboration with children – want to see interaction in focussed way. Know that there are issues. Keep it simple.

Wendy: RC worked because it was simple – if overcomplicate things then less focus on interaction.

Kaska: lot of freedom which is good, but not connected to findings.

Wendy: yes, we have a clearer gaol here.

Annalu: system can be adaptive in having different levels of collaboration – start one-to-one and then have facility to develop to other levels of task.

Kaska: in relation to age issue, thinking about difficulty levels – may not need to restrict to one age, but accommodate tasks to age.

Oliver: yes, but if start form idea of robot + agent + child too complex – start with child + avatar, then introduce objects, then face, then other person, then build up. So start with simple environment, where they can observe own body movement and expression, ..

Wedny: Blast theory – you are present and control self. Technology, user users desktop, other user uses PDA. You control person and yourself. You are trying to

catch person, they have PDA and can see you – you invest in it who you are. There are no of things going on. You see yourself, you see other person in real world. You also have chat, “I can see you coming round the corner”. Was set up in Cardiff museum, plus others out in Cardiff city locations. In terms of interface was one person plus who you choose to play with, very symbolic graphic language rather than sophisticated interface.

Kasa: ths does provide immediacy in how skills are transferred.

Wendy: unusual to get more than 1-to-1, but in this case there was much more spontaneous interaction.

Helen: so user was virtually in the real world, goal was to catch the other partner, who was in the real world.

Oliver: important is that child can see themselves, can start with mirror.

Kaska: let us define task as far as possible?

Wendy: some good points about making the robot representative – children do identify with characters. Child may want to interact with robot more than with agent.

Oliver could be that this is end of chain of settings.

Kaska: was thinking about:

Is task good and why?
What context should it be st in?
What concerte snippets of interaction?
+ and – of using with ASD, educational +/-; technology +/-

Also what aspects of interaction talking about – gesture, expression, etc.

Need to try to think about research questions

Things like:

1. Child to be able to see themselves
    - either as avatar or as character you identify with
    - range of characters you interact with

2. Simplest task:

Developmental stages of development: dyadic, triadic, etc.
Match tasks to capture levels or other theoretical framework.

Helen: like about robot idea is learning through teaching; collaborative learning

Environment: projection screen to capture motion and facial expressions of child.

Stage 1: primarily a mirror that enables the provision of external model of themselves that they can manipulate. Relates to Wendy's work on shadows, where can play and experminemnt.

We can simplify what is represented eg as stick figure, where we abstract ther features that are represented.

We can focus on particular features eg enlarge and present face.

Annalu: Cambridge work – facial expression recognition

Karen too complex, really just context free library of emotions

Oliver: first if mirror world

Phase 2:
Collaborate with agent – and have tasks with the child and agent

Annalu – tasks within task – eg give me the box and agent drops it, so is sad….

Task within task is do something with an emotional response.

Then can stop before expression, and ask what emotion should be experienced. Agent could give different emotion from child and react differently.

Genaro: start with simple and develop

Wendy: paper on object capture and gaze and assess attention through gaze. Objects as focus of social interaction.

Oliver: as well as gazing at object, have to focus on face also.

Tim: can do with abstract faces, but some work is on more complex scences. If have reactive gaze system, could respond in relation to task dedending on where gaze is. For external manifestation they get to express facila expreissons – make reaction contingent on task.

Karen: are we trying to create an environment that answers research questions, or to actually use in schools, etc.

Technically most difficult is face and gesture capture – Tim – can do rudimentary things with webcam, but may not be accurate enough.

Annalu – need quite good detail here.
Need a better grasp of where going here. Working with teenagers with Asperger's syndrom, the children cannot verbalise why they are 'acting out' – e.g. cannot express how they feel about a specific issue.
Get better ahndle on what the goal is.

Kaska: goal is to support children to interact in a social context. Very broad. Goal today is to focus this.

Genaro: worried about gesture capture. Users may not invest enough to make avator model them.

Tim: need to make task motivating.

Genaro: sims is very open-ended – customising agent is main motivation. So identification is important.

Tim – are ASS users more of less likely to move to Sims?

Wedny: but they do get engaged by shadowing – tried with webcam – was limited setup but was very motivating - "itoy"

Tim: Playstation 3 may have conferencing. Can interact in space with device, and can also control your appearance as choose – and see yourself.

Helen: as well as modelling behaviour in real time, also record for playback and viewing.

Annalu: in school the SLP taped children's speech and played it back – child thought they could be understood – but children were quite traumatised when they heard how they sounded.

Karen: have used a lot of video in teaching with non-verbal children – have been very successful. So finding way to mirror and capture is useful

Annalu: also can look at this – what effect it does have and how it affects their perception.

Wendy: does provide an additional context.

Oliver: proposal for task – child in front of screen. Child see avatar of self. Have number of objects, Some are out of reach. Other agent has a ladder – have ot

ask other agent to get it for them. Cannot get the ladder unless you are smiling, or perform particular social action?

Genaro – what if child does not get ladder?

Sandbox:

Karen: initial reaction – too promt dependendant, does not permit failure, wil teach spec ific context dependend skill.

Wendy – liked until introduced ladder….

Genaro: could just touch it…

Oliver: you have ot get something from someone.

Wedny: could be something more abstract for movement – reaching is in itself a good task.

Helen: could be you need to get and apple for yourself and for someone else.

Karen: in PCS they need to hand over picture in exchange for object. Becomes more sophistaticated. It is prompt dependent,and learning that they can impact on someone else. Issue is how you make it happen and what if you do not do the right thing. Prompt dependenet – if responde in right ay they get positive feedback.

Annalu – they learn how to achieve the task – learn cause and effect, and that leads to next effect.

Oliver: is prompt + or -?

Annalu – it is how you do it. “Do A” – right of wrong – bit iffy.
But do A – let’s see what happens – more exploratory rather than required action.
Have to build in that some things are more successful than others.

Helen: all things should have some success..

Wdney – intercae is series of triggers rather than prompts.

Oliver: Many things are possible, and tis is one of them.

Genaro: empty screen with avatar – when move, avatar moves; then avatatar starts telling story; story has tasks;

Annalu: remond us of medieval tale

Olvvier: mirror – collaborative, then narrative, then teaching robot

Wedny: lego racers. Have to collect components of the game or characters to play n game or component sof car. Then you challenge what made by giving it tasks – so try and drive car but need wheels. Or can decide who you have in the car. Which in turn affects task. So the preson may determine whether you succedd,

Tim: elements could be socially related. Start with stick figure, could collect parts of robot to build it.

Wedny's nephew – likes being rewarded as collect objects, need immediacy of reward – need to be careful of how to use rewards.

Tim: design process – shoul dbe able to get reward, get feedback from users

Karen – users having tasks, quite sociable, eg amount of food or sleep

Tim: could be you collect avatar. It collects your ability to express movements. Collects arms and gestures, and then face. Motivated by tasks. like tamgotchi.

Kaska: how does this realte to social dmenstions.

Oliver: prefer to have complete body that can function.

Tim: trying to break down aspects of social communication

Karen: start with fully functioning avatar, then control individual aspects e.g. control arm movements.

Kaska: recognition of self and self exrpeission; then engagment and whatever it si that we awnt them to recognise. Start with self, low end of enrinment. Then engagement with others is development.

Oliver being self anf otheri interacting in same space would be new.

Tim: lot of theory of comprehension is based on mirroring systems; regison in brian in self perception and perception f others are related. Project own expression and buld on that.

Annalu: Suzanne Zeebyck – child interaction and autism, profound cases.

kaska: could have child trying to get object by themselves; ladder introducex need for others, and need to include others

Helen: use constraitns on the enrinment such as “you can only see people” so you must communicate by gesture, they cannot hear ou: or there s a high wall, they can only see your face.

Wedny: This would aalso enable others to relate to the diffuclulties that ASd users have with limited access

Tim: so use constartins on the enrvionment to build up the interaction.
Need to break down social interaction to features.

Kaska: move on to the theoretical material.

Summary:

Karen: what visualised have an avatar that is mirror of chid that child controls.

There are context and story line, sequence of evenst.

At different levels have different aspects of communication: they cannot hear oyu – you have to coomunicate;

Finally arrive at top level.

Bring in different people at different levels.

Move to higher leve in triad.\

Individual then dyadic then triadic pssibly.

Annalu:

1. Start with sandbox, with exploratory play, only self mirroring; DOING

2. Then ‘needs based’ command oriented transactions with one other agent; transactional model (Cheepen) BEING AWARE OF CONSEQUENCES;

3. Then move to interactive communicative with more agents in story/narrative context. AWARENESS OF CONSEQUENCES ON OTHERS
    a. scripted formulaic interaction
    b. Verbal self reports
    c. narrative engagement with aspects of verbal expression

MAKING THIS CONCRETE THIS THROUGH ACTIONS AND EXPRESSIONS

Karen: PCS starts with requesting, moves to ability to comment

Oliver: verbal expression of emotion;

Annalu: ends up with more narrative generative game than provides story.
Annalu – designing for diversity not specific population

Actions: everyone to engage in tasks of reshuffling knowledge we have on wikki e.g. supporting research and technology

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Discussion of studies:

What are the features of games that make them attractive to users with ASD.
Wendy interviewed nephew. Number of features identified – could form basis of interview/survey with users.
He played with others in his school on-line, and then moved to actually interacting with them in real life, in school.

Kaska: Feedback from Diana:

- balance between technology and social science – need both; neither should be notional
- have to be really clear about the findings – what concrete findings will be expected, e.g. impact of tech on specific skill – also how ot present how achieve balance between tech and social science.

Other comments: good that we are building on existing technology.

Strengths: involvement of users in process throughout.

Tim: anyone who has technological insight – check feasibility, do we need other partners, etc.

Kaska – we also need to map out the technologies now we are clearer;

Oliver – we can make list of features of tech.

Oliver: findings: we can improve social interaction of particular user group?

Kaksa: impact of engaging children in social interaction on communication.

Oliver: e.g. finding “children’s skills improved in X way after Y time”; do we need pre-and post- test.

Annalu: focus is on process. Using ti=ool will priivde additional information for teachers, etc. Will interacting with tool inform better what they can do??

Helen: if they use these sorts of tools, what impact will that hav on the social interaction behaviour – were certain tasks more difficult; what can they do

Wendy: are we looking at intentionality?

Kaska: what aspects of social interaction are we focussing on?

Karen: when we are looking at findings in relation to enviroemtn? Or broader.

Helen: focus on what happens in the environment. Then a secondary issue is an additional affects of using the environments, e.g. more interaction with others in class;

kaska: pre-and post testing of social interaction before and after.

Annalu – need another year and longitutudanal study.

Oliver we need to show that there will be impact in real world.

Kaska: we need to show it improves inclusion. How is it inclusive?

Helen: we have ot be very careful on the testing – it may need to be more qualitative and informal

kaska: test on interaction ith other child

Annalu: every child has programm in school; has goals; set specific goals for each child;

Karen: looking at interenvtions in autism – there is little evaluation – and is very specific to inervention itself. We agree that we need to look at transfer, but how do we best do the measures and keep this feasible.

Helen: we cannot do tight controlled experimental studies – we do more case based research

Annalu: only recently a move into evidence based research.
Use formal testing to describe child at the start. Then do case studies, qualitiative studies. The basic skills might not change, but the interaction may not change. Within formal parameters we need to document progress .

Tim: it may seem quite constrained/

Oliver: we will need to do qualititative and quantitivive studies

Issue: do we expect concrete improvement in X? More that we say that we observe changes in X?

We will make predictions and hyptheses, but these should be in relation

Karen: situate clearly in current practice, and how we see it being used in the classroom;

Annalu: can child progress thorugh the levels? that is an outcome

Wendy: look at levels – predict outcomes – how can we measure it and look for evidence; some of it will lend itself to different tytpes of measuers. We may be looking for what we do not know – rather than what we know.

Karen: have baseline assessement tools, then monitor use.

Tim: is we have levels clearly formulated, then we ask teachers to predict where student is and where they can they go.

We can use standarised tests to see what changes there are, but not saying that they will necessarily change.

Wendy: communication check list – reworked it – not waste of time – but reactive colours would have failed if totally relied on that. Teachers said that we did not get any of this, but we got this instead.

We need to make explicit that the formal existing matrics cannot be used in reliable ways; but that we expect other observations to emerge;

Genaro – studies where the user learns to perform task, on formal tests, but cannot apply it.
In English class, there are set of abilities, understanding texts and making it meaningful. Can we pre- and post-test that – can we use these – Helen: but we will be limited in what we can test

Karen: what of the main measuers wil be the differences

Helen: look at within and between group behaviours in use of the tools.

Tim: there could be different groups within project that look at different aspects.

Annalu: there are different stages in user-centered design – initial formative studies will help decide what to measure and how to develop metrics.

Kaska: let's move to what aspects of social interaction dimensions we will focus on.

Karen: also what do we mean by user-centered design in pilot study v. main research proposal.

Kaska: so focus on what dimensions are….

Kaska: explicit social interaction aspects

Annalu: 3 levels within interactive communication

Oliver: aspects of social communication in Sandbox. Mirroring

Kaska: doc on aspects.

Helen: gestures, facial expression, body language, verbal expressions..

Oliver: they can speak but nothing will happen.

Wendy: descriptive vs. expressive language

Karen: verbal vs. pre-verbal……..mirroring and imitation is a part of their signs of pre-verbal. ASD struggle with mirroring

Helen: distinguish between context and assumptions. Context = avatar and what the user is mirroring

Anala: enabling self-perception…….indicating that they understand they have intentional control over the avatar.

Oliver: being able to see your own expressions and motion is “a good thing”.

Kaska: indication of your knowledge of self-expression

Helen: how do we observer/test the hypotheses related to Sandbox

Annalu: observing the user moving with the intention of making the avatar

Tim: task based movement

Oliver: that’s next level…should just observe intentional movement.

Karen: P levels identify these levels of function….

Wendy: has the P levels.

Helen: use video analysis and P levels to measure

Tim: + interview to get introspection

Annalu: boredom….time of satisfying interaction……random movement, onset of purposeful movement…..-> boredom

Tim: how to detect purposeful?

Annalu: you cen see the lightbulb come on when the children realise the control they have.

Kaska: chimp self-awareness

Helen: agreement of various viewers whether the movement is purposeful

Kaska: self-aware + purposeful movement……is there a qualitative change in the behaviour of the move from thinking the avatar is copying vs "being"

Helen: will there be a causal behaviour with the avatar

Wendy: English National Curriculum P-levels:

1. encounter with ICT,
2. connections between themselves and control devices (respond consistently), proactive in that the repetition exhibits preference

Annalu: what are the thresholds for these levels and how do we identify them?

Oliver: zoom of avatar relative to distance from screen…..mouth moves with user mouth movement and random visual/noise expression

Genaro/Tim: problem with 3D navigation

Tim: we start with clear mirroring (left/right reversal) but then we have to flip it when we start interacting in the 3D environment…..how do TD children handle this transition and how do we scaffold it….stage inbetween mirror and 3D immersion = avatar turns back on user and interacts with character in environment.

Karen: Peter Hobson 'Cradle of thought' self-identity (?)

Oli: how do we express the voice in an abstract way that isn't repressive….voclisation…..non-specific vocalisation

Kaska: hearing vocalisation is a key component of identification

Wendy: how does touch fit into this and how do we overcome the problem of switching the motion capture on and off.

Annalu: how much do they touch the avatar

Karen: where their body begins/ends

Oli: problem when we flip into the 3D space.

Tim: vocalisatin should have some visual/colour/soundscape change…..intention is a problem in ASD so visual manifestation could be useful.

Helen: could we get a clour/visual expression demo for the test study.

Wendy: Zack liberman (mezzo de vocce, New York)….conversations = visual effects. Reactive colour sounds.

Kaska: are these research questions sufficient…..what about self-awareness

Why do we want there to be a reaction to their vocalisation, movement?

Annalu: Can they make the link between themselves and the avatar.

Kaska: does this mirroring provoke the user to self-expression/expressive movement that they would usually not do in real-life…..and self-reporting?

Tim: possibly more relevant at later levels once the expressions are contextualised by the more realistic tasks.

Helen: self-report and comparison TD/ASD is a meta question

…move on to technology

Oli: problem of projection and motion capture….do we need a static background?

Annalu: can do with multiple cameras

….sound

Tim: need to include eye tracking

…Topics for Pilot

1. Look and Feel of avatar
2. Preference of games
3. Review of technology

What about study as described in proposal?

Kaska: we're not completely wedded to this
Oli: do what makes most sense.

Wendy: need to see what kids think are cool and why?.... World of warcraft, what social interactions do they use it for?

Annalu: what about mobile phones.

Tim: can we do it on-line?

Karen: has a community on-line we could contact.

Tim: Timescale = end of June, 4th April Genaro contract ends….need to get study finished in a month.

Helen: ethics?

Annalu: have to get permission from school head teacher then this should give us clearance for web.

Kaska: need to be clear on Questions for first study before specifics

Karen: can contact an unknown number of users but not sure about ethics

Annalu: ethics is done by each local education authority.

Oli: only 2 single user studies….3-4 kids for each tool

Helen: 3 tools maximum, 3 or 3 children each, each child 2 tools each.

Oli: make sure we get them to use versions of the tech that will be in eventual system.

Helen: need to suggest particulars…….what would they like to play with….why?

Kaska and Karen: collaborate to pitch questions and then group discuss.

Helen: where do children come from?.....

Karen and Wendy: can get a few kids who evaluate a single piece of software.

Helen: give them tasks to use the tools, ask them to interact, videotape and post-use feedback

Wendy: Luke can give us feedback on what type of games he and his group like to use.

Helen: survey with Luke in the form of an in-depth interview, then ask for help on proposals.

Annalu: can send Genaro on-line ethics form

Karen and Kasks lead development of survey (+Wendy), Genaro will put it on-line, Annalu ethics, every to comment and distribute

>mid March for Q on-line = 14th March
deadline end of March
+ design for study 31st March
collaborate with Luke
interviews during Easter break?

-everybody sends their availability (schedule)

Helen: begins talking about Bianca and Suzanne….

--now move to 2nd level (Transactional interaction)

Oli: camera flips them around into the 3D environment with a simple interaction

Annalu: need requests, turn taking, sharing, etc

Helen: two avatars: one as projection, one as collaborator

Annalu: space with 2 participants but initially no interaction

Oli: simple space, space with companion (no interaction), interaction

Annalu: proximity to other character triggers voice or something

Kaska: just acknowledge presence is the first level.

Helen: identify stages of interaction….(see Genaro's notes)

--need a transition period between Level 1 (mirroring and identification) and Level 2 (transactional) to orient user to the 3D environment and their scope for interaction.

-outlining stages within level 2

Annalu: how do we get negotiation of desires and intention at the non-verbal level

Karen: teaching ASD often require non-verbal skill training e.g. touching, pointing, vocal sounds

Annalu: can we use picture exchange task as a way of communicating with the other agent?

Oli: prefer to keep it all physical instead of using abstract symbols.

Annalu: will the child be able to manipulate the avatar through the first-person projection? Difference between using the avatar and controlling ?

Discussion of the task environment.

Issue of discussion of user movement and reflection in environment.

a. The self-avatar as represented on the screen, the environment will move around the avatar with the avatar in the centre

OR

b. The user can move around the space but not go outside, and the self-avatar moves around in the space, and if they move into another space then the environment gets redrawn as the new environment. They appear in the same relative position as they were in (ie against cinematic convention).

The control is by the user actually moving in relative space…. (rather than relative movement eg moving feet but not moving; or by 2nd person controls).

Tim and Oliver argue for b.

Annalu – what if the user fails at the task – they do not give the other the apple. What level of learning support is there? How far will the coll. avatar persist in insisting on getting the apple.

Each room has a different focus and the tasks will be set in the room. If fail to complete a task, they can move to another room, but the task they get may be influenced by this failure.

Alternatively a third avatar comes along and fulfils the task as a model for the learning. The user will not get this task to redo straight away, (or they might) but will be required to do this.

The skill can be represented in other contexts.

Measures can be the number of forms of request and modelling that it takes to do the task, and how much it can be generalised to other tasks.

Could vary request by verbal + no emotion; emotion but non-verbal; etc.

Can bring in dimension of competitiveness? Can they jump in ahead of the 3rd person doing the task? Can they prevent them doing the task?

Points: do they get points for fulfilling components of tasks? But… gender differences, ASD v TD.

Tim says he can mock up an example of this…..

We could try this out in the first studies…. ask what would you do now?

Get the children to draw the rooms?

Keep the rooms simple, with parameterised object models, with colour preferences: personalisation is key in this. Also keeping things not too complex/distracting for ASD users. Needs to be rich enough but not to complex…

Degree of realism in 3d space.

Question: to what extent can this kind of environment facilitate filtering?

We can choose what environment – increase the distraction and test again?

Reasoning about the user, what aspects?

Actions:

1. Oliver: speech recognisers and what they can do with kids

2. Kaska, Genaro: Scripts – for all phases of level 2 – write 1 example interaction of the entire thing.

3. Kaska and Genaro: Generating a concrete script to inform the survey. Try with TD children.

4. Karen and Kaska to do first pass of the survey by 14th March

5. Genaro to build structure for questionnaire – Tim has some materials, ready to plug questions in.

6. Tim will take a script and will try and knock up mock-up environment. Could build room in Unreal, or animation in Director (but only stick figures)

7. Annalu – write up forms needed for survey for permissions; and also draft whatever is needed for ethical permission for the studies – will do the information sheet and consent form for next week.

8. Focus groups with specialists – may use Luke and mother and contacts….
May need to check we have ticked the boxes here.