Interaction with a virtual dimension

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Interaction with a 4th Dimension

Description:

While not literally a 4th Dimension, this ability allows the user to interact and use an extra layer of reality to enhance their base skills. While the ability is enhanced with multiple users, it is also very useful for an individual user. This ability allows the user store knowledge in another layer of reality. As useful as memory is, it is easily altered, and rarely reliable regarding details. However the ability to overlay the world with a virtual layer allows you to store memories more accurately (videos), and set reminders more dynamically. The fact that this is a computer generated layer, also gives you access to computer generated responses. This could help you cheat at games, make calculations at super human speeds, and even find the quickest way out of a location. Additionally this abilities utility is compounded when shared, as it allow communication on a level that cannot be perceived without the ability. Mark locations, leave instructions and store objects that can only be seen by other people with this ability.

User stories for different uses of this ability

John has always had trouble remembering things. He is constantly walking into rooms and forgetting why he entered them. He is also easily distracted, focusing on a distraction, and forgetting what he was meant to be doing. He has tried options such as writing down what he needs to do, or setting reminders on his phone, but he still ends up forgetting important tasks. John wishes he had a visual queue to remind him of his current goal

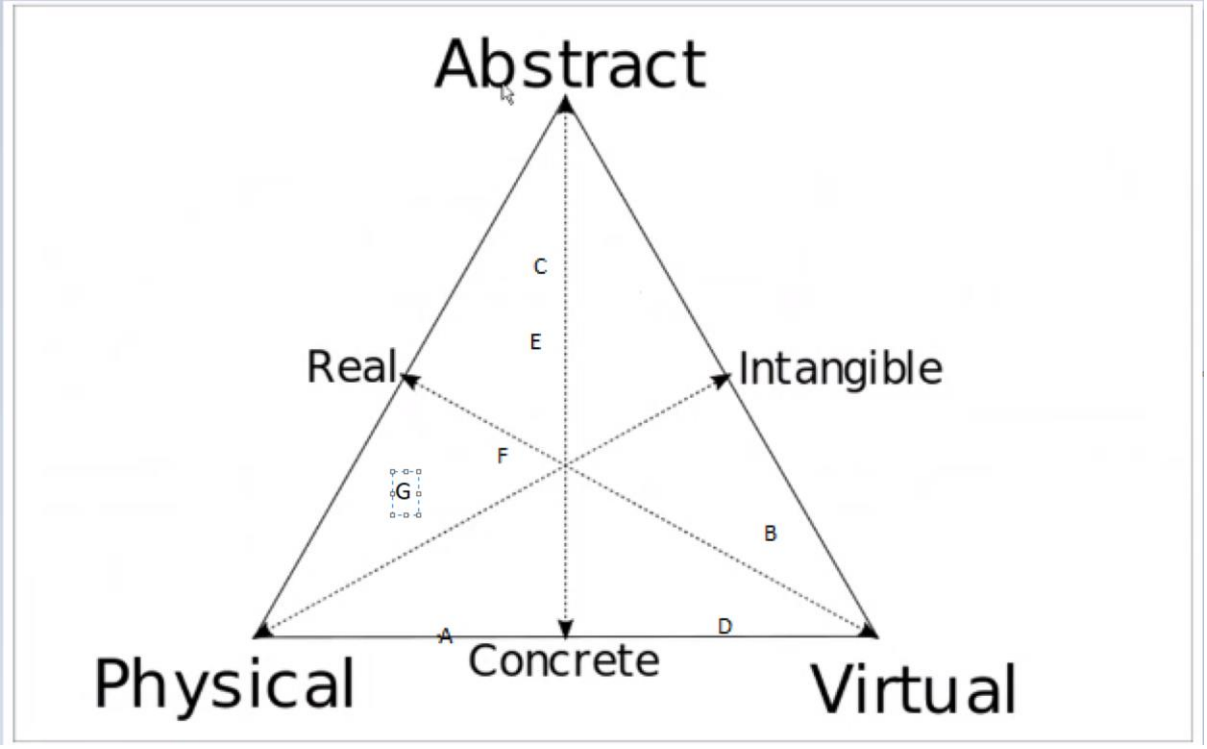
Jim loves fishing, and has his own secret fishing spot where he always catches lots of fish. While he is protective of this spot and does not want to publicise it too much, he trusts his friend Garry, and would like to share it with him. However Jim has a very different schedule to Garry, and they can never find a time when they can go fishing together. The fishing spot is very remote, and hard to get to, making it very hard to give instructions to find it (One of the reasons it has stayed a secret!) Jim would love it if there was a way to virtually guide Garry to the spot so he can see for himself how good it is.

June has always had trouble remembering things. Names, places, items on her shopping list, they all seem to slip her mind. She has heard that a good way to remember things is to have a “Memory room”. A mental location where you can go and place items that you don’t want to forget. For example if you wanted to remember to get snacks for tonight’s football match, you might hang a poster with your teams logo on it up in your imaginary room. June loves this idea, however she is horrible at visualising things, especially details. When she has tried this in the past she never remembers the things she has added to her memory room, defeating the point! June wishes there was a way she could have a physical memory room she could take with her and step into every time she forgot something. (Idea based on Sherlocks “Memory Palace” which was mentioned in last Wednesdays class)

Chosen User story

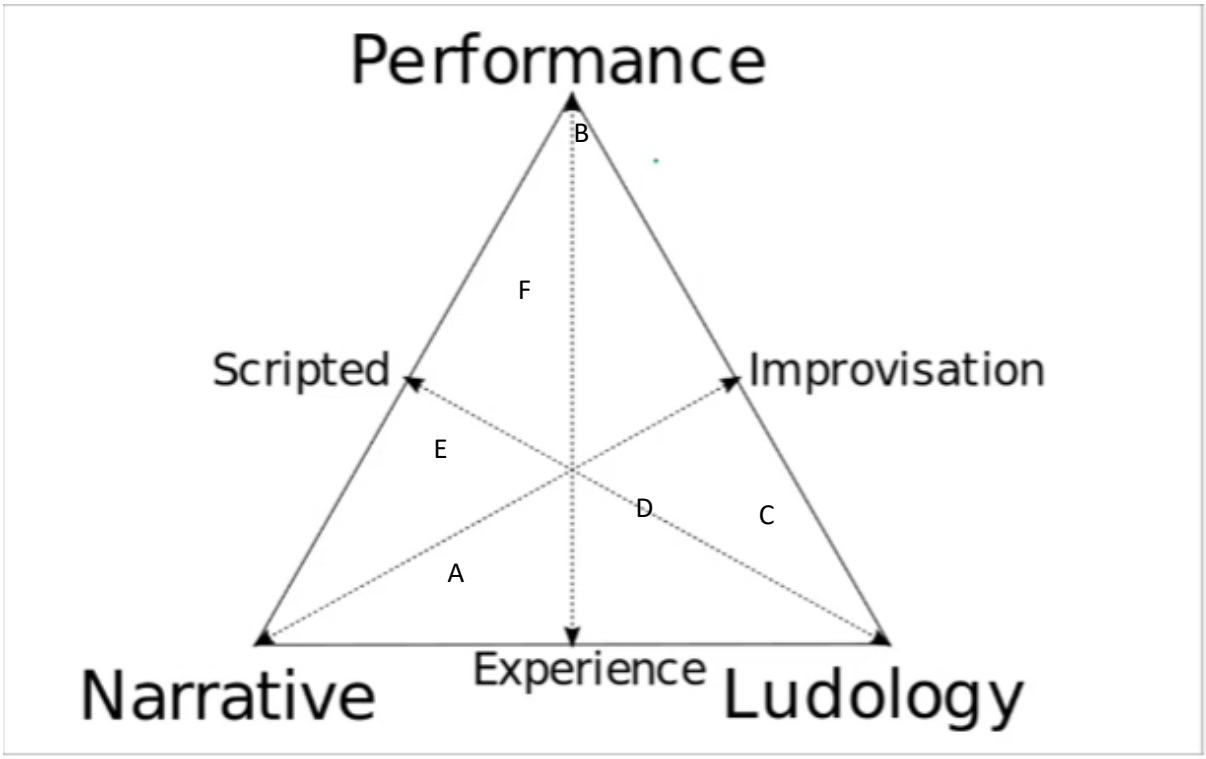
Mark is a field worker for an intelligence agency, and he is often working with other agents. A key aspect of Marks role is that he is required to communicate with his colleagues without being seen to be communicating with them. What makes this harder, is that often to communicate effectively he would need visual queues, but he cannot be seen to be pointing at things in hostile territory. Mark wishes there was a way to place a virtual marker that could only be seen by fellow agents. For these markers to be useful, they need to be accurate to what Mark is trying to identify, and Mark needs to be able to place these markers in an inconspicuous manor.

Enhanced Reality Scheme Brainstorming ideas



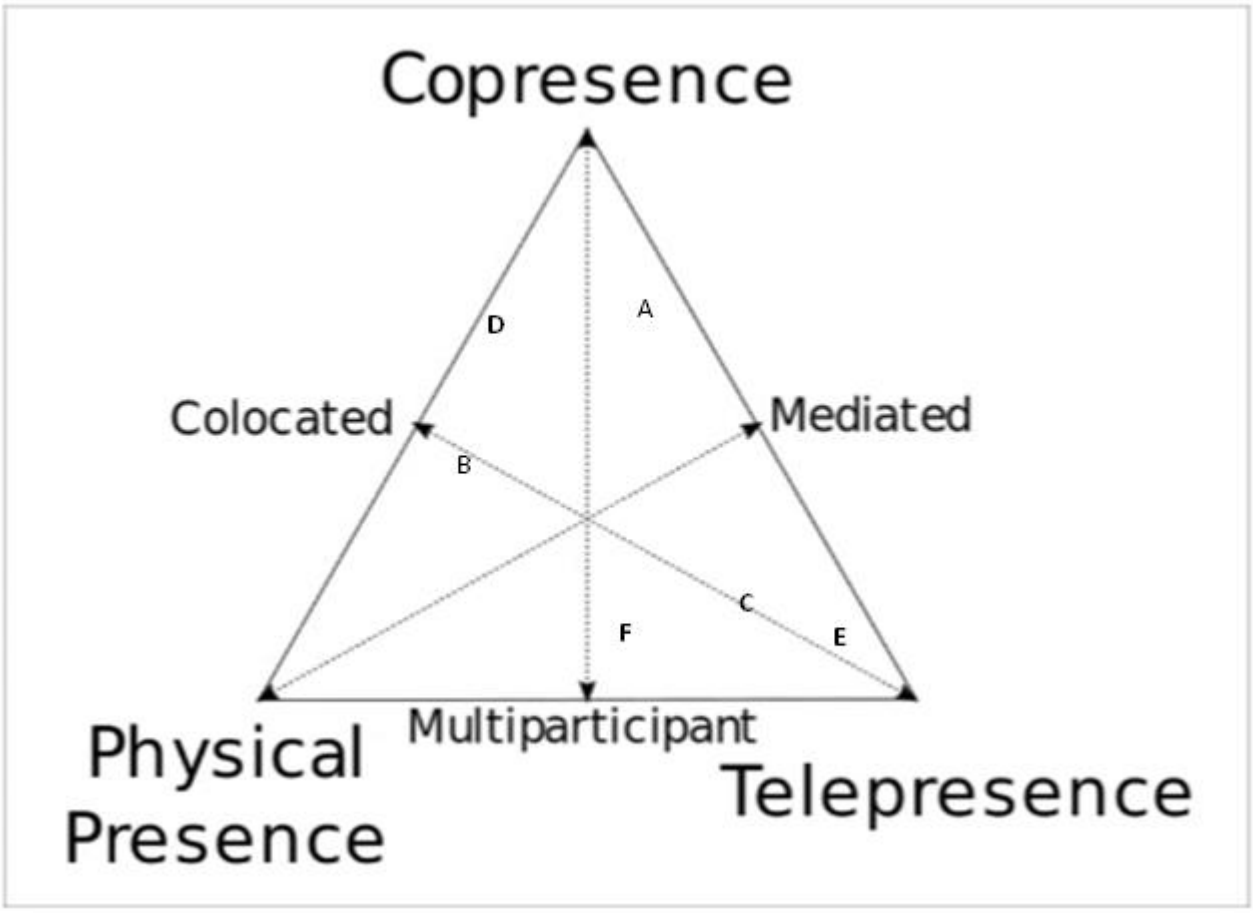
Location

A. Physical Items scanned and virtually placed in a physical room
B. Emoji/symbols on objects in a virtual room
C. Symbols virtually overlayed on the physical world (X marks the spot)
D. Physical Items scanned and placed in a virtual room
E. Notes overlaid onto the real world (Shopping list on your sunglasses while you shop)
F. Notes virtually placed at physical locations, such as a virtual list of tasks to be completed when cleaning the house located on the laundry door. Tasks could be interacted with (cross item off once completed)
G. Have a highlighted border placed over items on your shopping list to find them easily at the store.



Experience

A. Follow the footsteps of historical figures by following virtually placed markers. Have virtual footage of the historical event play over the physical landscape
B. Cheat at a game. Get answers for a quiz overlayed in front of you. Have a Chess bot virtually show you the best move to play. Get the told the strength of your poker hand
C. Have a virtual interface for your physical board game. Virtually see your available chess moves when you pick up a physical chess piece. See your character virtually fight on the physical table in Dungeons and Dragons.
D. Play virtual real time strategy games using the physical world as your battlefield. Command virtual troops over physical terrain
E. Participate in virtual scavenger hunts/races in popular cities, compete against other players to complete the game the fastest/gather the most collectables/ answer the most quiz questions for things you learnt along the way
F. Successfully remember all the tasks you had to do on a trip to the market



Presence

A. Enter a virtual “Memory room” to store/view reminders for important tasks
B. Have a virtual pet that can follow you around the house and “interact” with items (Climb on furniture, drink virtual water, and eat virtual food from a physical bowl)
C. Virtually connect to a camera in a meeting that allows you to look around the room
D. View, place, and interact with virtual markers, placed in physical locations (X marks the spot, directions from google maps placed on the ground in front of you)
E. Remotely visit tourist destinations
F. Remotely visit locations and leave behind virtual markers that can be viewed by people at the physical location. (Placing markers like point D, but doing so remotely)

Enhanced Reality Scheme Brainstorming

When looking at how we can best fit the requirements laid out in Marks user story in the location domain, C would be the most appropriate (Symbols virtually overlayed on the physical world). This would allow Mark to leave behind markings and signs that are linked to a physical location. This would allow him a wind arrange of methods to communicate effectively with his colleagues in a variety of different ways. This could include marking the location of a supply stash for an agent to pick up in the future, or marking a target for immediate surveillance. The ability should also include F (Notes virtually placed at physical locations), for greater functionality. These notes could be dictated via voice.

Looking at the Experience domain, we need to aim directly at the Performance direction. While are not looking for the exact example used at that point (B: Cheating in a game), we are looking to give Mark an advantage, and allow him to perform his role at an enhanced level.

In the Presence Domain, we are aiming to be close to the collocated point on the triangle. Mark need to be able to interact with both the physical world, and the virtual one. This is important as Mark needs to be able to interact with the virtual world to get any benefit from this ability, but he also needs to be able to do it while being fully aware of his physical surroundings, to remain inconspicuous.

Components that will be used, and their relation to the user story

Component	Relation to user story
Enabling persistent augmented reality experiences and shared location recognition using cloud anchors	The ability to place a virtual item in the physical world, and ensure accurate placement is vital to this project. Mark needs to be able to ensure accuracy when marking locations for his colleagues. To ensure accuracy it is also important that once the virtual item is placed, it remains in its place in the physical world, and does not move/follow Mark when he walks away. This is the most important of the below components to get working for the prototype
Tracking your location globally using GPS	It is important that we can track Marks location when he is in the field. This allows us to map out Marks path, and upload it to his devices memory. The if Mark or one of his colleagues need to retrace his footprints, his previous path can be overlaid onto the physical world, showing them the path. This could be especially useful, as it could allow Mark to quickly navigate an otherwise dangerous path (safe path through a minefield).
Supporting interaction using speech recognition	It is important that the device allows Mark to interact in multiple ways, including speech. While there may be times where mark is unable to speak wile being inconspicuous, there are also times where speech may be the easiest and most concealed way to mark a location. The ability to look at something and mark it with one word would allow Mark to quickly point out important landmarks.

Tasks to be completed

The following tasks will be completed and uploaded to Github as they are completed, after they have been tested and confirmed to be working. By doing this we will be able to ensure we always have a working version to rollback to if required.

1. Open a unity project and set it up to be compatible with an android device. Gain access to the devices camera.
2. Allow the user of the application to place items/signs/text on the screen
3. Allow the user to lock the items/signs/text to the geographical location they were placed on.
4. Allow the application to locate the users geographical location using GPS
5. Use the GPS signal to trace the users path
6. Allow the user to name the path
7. Allow the user to load a previously saved path so that it can be followed
8. Once the path is loaded, display it as a path to follow in front of the user
9. Allow the application to take in Audio
10. Allow the application to convert speech to text
11. Allow application to add text to environment via speech to text
12. Allow this feature to be toggled on and off

Nature of the Prototype

The prototype produced will allow the user to place markings that will remain in place. This will allow the user to mark out important locations. The user will be able to annotate these markings with speech to text. The user will also be able to save paths of their travels, and load them so that their steps can be retraced.

“A day in the life”

Mark woke up and got dressed for work. Today he had to perform surveillance on a factory believed to be storing weapons. On his way to the factory Mark noticed a large amount of traffic on the main road and decided it would be too risky to come this way when he returned. When Mark arrived on the outskirts of the factory he made note of multiple surveillance cameras. They were easy enough to see now, but would be hidden well at night when he planned on coming back. Because of this he marked them with red squares in his virtual environment. As Mark watched the factory from a distance he noticed the only way to get to the factory without being see by security was through the swap behind the factory. It would take Mark all night to find a way through that swamp. It was now Mark realised he would have to find a way through the swamp one night, and then come back the next. Mark was thankful once he had found a way through the swamp, he would be able to save it in his virtual dimension. This would mean he would be able to both approach and leave the factory much quicker once he had found a path. On his way back home he found a quieter road to approach the factory by. He returned to the entrance of the main road he wanted to avoid and told his virtual environment to make a note not to take that road. He did not want to forget how busy it was and accidently travel down it tonight.