Week 1

Observe and describe a variety of experiences where you feel particularly Immersed– in any or all of the senses we discussed today. Were you reading an article, having a deep thought on your own, hearing or playing music, playing a game, solving a problem? Were you passively observing or actively involved? What aspects made these activities engaging? compelling? captivating? What elements were involved? What techniques were in operation?

- When playing Firewatch - Firewatch is first person game designed to make you immersed in the Shoshone national forest. The game starts with a backstory where the player has total control over the story and the creators cleverly address the player as 'you'. The actual gameplay starts in the forest and we play the role of Henry, a fire lookout. We are all alone in the forest and our only means of communication is a walkie-talkie connecting to our supervisor, Delilah. The game itself is a bit cartoonish but the environment is designed beautifully and the fact that we are all alone in the forest and our main job is exploration adds up to the immersion. The mystery in the story combined with the background-score makes Firewatch an immersive experience.

- When watching Kubrick's movies - Kubrick is known for using minimal cuts in his movies. He deliberately does this to make the viewer familiar with the objects and environment in a scene and the only variables are the actors. I think this creates immersion and can be experienced in his movies especially 2001: Space Odyssey and Barry Lyndon.

Observe and describe times when you are engaged in some forms of analyzing. Were you working on homework? Are you making a decision about what bus to catch? What show to watch? Are you making judgements about your friends or family? How do you decide what to order at a restaurant? How do you approach solving a difficult technical problem? Do you have certain analysis habits? Do you notice other people approaching problems in different ways? How do you know that your approach is the effective? Do you use multiple approaches?

- Debugging - Whenever I have to troubleshoot a code, I'm fully engaged in the process starting from searching the error message in stackoverflow, getting a sense of the problem to dividing the code into smaller black boxes to find the exact code causing the problem to trying different things to fix it.

- Training a neural network - Training a neural network is a dark art where you don't actually know what the network is learning but you have a bunch of knob to turn like the learning rate or activation function or number of layers/filters or structure of the network

or the dataset itself. Tuning the network so that you get the desired output is hard but engaging. While it's training you can monitor the progress with help of a validation set. You can review what network is learning and what it's not.

Week 2

Write a short response describing the experience, the interactions, the visuals, the sounds. What did you like or not like? What aspects felt realistic, interesting, immersive, engaging, off-putting, ...? Does VR provide you with something that can not be replicated in more common media formats?

My experience is with the CAVE VR, which is a large display visualization system with 72 monitors and surround system with 360 degree tracking. It is mainly used for visualizing large complex scientific data. I liked that you can immerse into actual space with human scale and bring in people to look at the same data and do analysis. We looked at a brain dataset which showed all the pathways encoded using colors. The person who controls the tracker can walk around move the perspective. It lets us walk into the brain and see particular pathway and it's connections. Human-scale and collaboration aspects are key two things that a normal monitor cannot replicate.

Readings

"Liquid Architecture in Cyberspace"

- Cyberspace offers the opportunity of maximizing the benefits of separating data, information, and form, separation made possible by digital technology.
- The key metaphor for cyberspace is "being there" where both the "being" and the "there" are user-controlled variables, and the primary principle is that of minimal restriction. Maximal binding, implies anything can be combined with anything. Cyberspace is thus a user-driven, self organizing system.
- Architecture, most fundamentally is the art of space. 3 fundamental requirements for the perception of space
    - Reference
    - Delimitation
    - Modulation
- Cyberspace, the space of art is architecture, has an architecture and contains architecture.
- "Liquid architectures" stand for a non-objective reality, where the composition of space is the object reality and it results from a construct of one's mind.
- Cyberspace=immersion

"Immersive Analytics"

- Visual Analytics was introduced a decade ago as "the science of analytical reasoning facilitated by interactive visual interfaces"
- A classic use-case for the CAVE is "walk-throughs"of human-scale architectural and engineering models
- On the other hand, we have also seen the development of inexpensive commodity technologies—such as the Leap Motion , Kinect , Oculus Rift and (soon) Microsoft HoloLens

- Collaboration can play an important role in information visualisation by allowing groups of humans to make sense of data [23], [24]. Collaboration might also be the key feature to successfully understanding big and complex data [6], [25]. Yet little research has focused on collaborative and immersive environments for abstract visualisation
- CAVE2 - 4K display + tracking devices

Week 2

Performing in Quantum Space: A Creative Approach to N-Dimensional Computing

Indeed, it seems as though these disciplines were much more united in a time when using the senses to understand complex information was a key to the learning process.

The researchers are immersed in their data as if in the real world and have the ability to use their senses to experience complex information from the sub-atomic to the universal

Media artists are working with computer scientists to develop new modes of interaction, generation, and manipulation of n-dimensional data sets in a large-scale immersive computing system

Generation and representation of very complex data visually and aurally will be accomplished through interactive gestural control, much in the same way that a musical ensemble would perform a musical composition or a team of surgeons would perform an operation [4].

Immersed in Unfolding Complex Systems

Allosphere - Her intention was to provide a common meeting ground where diverse researchers can share insights and pursue similar fundamental questions about symmetry, beauty, pattern formation, and emergence.

Beauty no doubt plays a central role in our perceptual engagement, as it is closely related to symmetry. In fact, beauty and symmetry have shared an intimate relationship since the time of the ancient Pythagoreans, who stated that the key to beauty lies in the proportions of parts and their interrelationships, and that symmetry and harmony are the interrelationships in the domains of sight and hearing, respectively

Symmetry has also played a less acknowledged but vital role in computational simulation. In ancient times, we could observe only the patterns in nature around us; today, through the control over proportion afforded by computation, we can compose systems that generate complex natural patterns with precision and autonomy. At the heart of these complex patterns, we do indeed find symmetries. In fact, symmetry often helps guide our search for significant patterns in the data

Our work involves not only the design and instantiation of complex systems, but also—and just as importantly—the composition of a filter that reduces the overwhelming vastness of the computational/mathematical spaces into forms that we can perceive and draw meaning from

We often ask ourselves the question “what are we looking for in the data or system?”
To begin answering this question, we can say that we are looking for the interesting patterns that reveal essential aspects of the system as it unfolds

We know that too much symmetry reduces significance, while too little symmetry is overwhelming; the filter must fall between these extremes of order and disorder. This also applies to time: patterns of interest must maintain identity long enough to be recognized, but also change sufficiently to capture attention.

We find that multimodal representation is important for revealing otherwise hidden or nonobvious symmetries and asymmetries in data.

Week 3
3D InfoVis is Here to Stay: Deal with It

InfoVis is different than traditional applications that are inherently 3D, such as architecture, industrial design and some scientific visualizations of 3D phenomena

Consider the pin map in figure 1. Stacks of pins indicate counts: as a 3D display the heights of various columns can be accurately estimated and compared whether large (e.g. Boston vs New York) or small (e.g. Chicago vs Seattle).

Learning curve is less for 3D

The (Possible) Utility of Stereoscopic 3D Displays for Information Visualization: The Good, the Bad, and the Ugly

The good
The reviewed studies relate specifically to spatial cognition and spatial information understanding tasks with possible direct relevance to scientific, information, and data visualization. Overall, the results demonstrate improved size and shape perceptions, and improved spatial scene understanding, across various tasks utilizing S3D visualizations. Improvements were evidenced with increases in speed or accuracy of task performance, or in some cases, both. Tasks under investigation primarily involved traditional mental rotation tasks, air traffic control airspace judgments, virtual object size judgments, and network data interpretation tasks.