CS 524: Final Report

During this semester I have explored the visualization of human brain's connectome. This topic is very interesting and challenging from several points of view. Firstly, visualizing the connectome is very challenging mainly because there are many aspects that should be visualized and it is very easy to fall in a visual clutter. By their nature, connectome datasets creates highly interconnected graphs, so a careful analysis of the domain is needed to perform the right design choices to best fit the real needs of users, neuroscientists in this particular case. Secondly, the idea behind the intrinsic geometry was pretty novel, so I had the opportunity to face the visualization of a new concept. By doing this, I was in charge of creating the visual representation of a new idea or, in other words, of visualizing something that has not been visualized before, at least in a complete a comprehensive way. In that sense, I was able to think about different solutions without being influenced by any other important study in the field.
In a more general way, lately, I had to face the general problem of drawing highly interconnected and highly populated graphs. The human brain's connectome is just of one of the many examples that may be present in the real world. Techniques such as the "edges on demand" are pretty general and could be applied to many different domains.

In the future would be good to keep working on the same project, making the entire visualization more attractive. During the last semester I was not able to make the visualization very attractive, although its functionality are useful as well as interesting. As for now, the visualization of links in the graphs is not as effective as I thought at the beginning. I still think the transparency is the best way to proceed, but I would like to find and test more solutions in order to better understand the human beings perception when looking at weighted edges. About the same topic, I would like to experiment new approaches about the shape of links. For example, I would like to use curved lines, since by doing that I am expecting that this technique makes it easier to reduce the visual clutter when visualizing relatively complex and highly interconnected graphs.

During the semester I have worked principally on my main project "BIGExplorer" to visualize the human brain's connectome. The help Kyle gave me was very precious especially during the last phase of the project, when I was writing the paper for the SciVis conference. During all the class I did not work very much on others project, but I tried to share my opinion with my mates about their projects with the aim to improve their work or to find alternative solutions.