# #immersiveSearch

**CSC 591, Spring 2020**

## Stage-1: Research

**Team:**

| S.No | Name | Unity ID |
|---|---|---|
| 1 | Anmol Desai | adesai5 |
| 2 | Jash Dhakad | jdhakad |
| 3 | Nidhi Goenka | ngoenka |
| 4 | Shreya Parikh | scparik2 |
| 5 | Vishwa Shah | vushah |
| 6 | Sameer Thummalapally | vthumma |
| 7 | Cheng Yuan | cyuan7 |

**Client:**

Jason Broughton of LexisNexis.

**Long Term Goals:**

LexisNexis is known for providing computer assisted legal research and is one of the leaders in the same field. We are given an excellent opportunity to collaborate with LexisNexis for a unique project, which leverages technical acumen in order to achieve a tangible deliverable which can enhance the search tool for the users. The company has vast data that legal professionals access to help win cases. Today LN users access this data through a web search interface. The data is uniquely dense and often textual. LN seeks to use VR/AR to help its users access relevant data, gain insight from that data, perhaps while composing documents. In this project, you will learn about legal search and AR/VR, envision a range of AR/VR applications to search, identify those that are most promising, then quickly mock-up and evaluate them.

## Challenges

### 1. VR is in the nascent stages of usage and so we are unsure if it will work in our case

Currently, VR has only proved itself useful in the entertainment industry, so to estimate the usefulness of it in our project is a bit tricky. Also, getting hands on experience of VR is difficult. There are very few VR devices which we have access to. So, experimenting, testing, and assessing usefulness will be tough.

### 2. VR usage is expensive and has been widely used only in the gaming/entertainment industry

Standalone devices are very expensive in today's market. So, its implementation in any project without concrete knowledge is a great financial risk.

### 3. UI design of the VR like multiple tabs of a webpage

In the case of a webpage, as per current user reviews, individual search results from the filtered list of cases are opened in separate tabs. This feature of web pages, allows users to skim through the list of cases whilst selecting relevant cases to view in depth in separate tabs. In the case of VR this functionality will be difficult to implement since providing a system like multiple tabs might prove to be a challenging task.

### 4. Finding the right view for users

Currently, there is a "title view" mode to presenting the results of the search query, but, according to our mentor, this mode is rarely used because in a legal case, titles can't really reveal much useful information about itself. A very detailed view would also be a problem since in that case the number of cases displayed on a particular page would be reduced drastically, thereby reducing the scope. Thus, finding the "right" view for the users, here, which displays results concisely and provides an adequate amount of information is important and a fairly taxing task.

### 5. Finding the most relevant paper is a gruesome and tedious process

As per our discussion with our mentor, it is very important to display relevant results for our users in accordance with the filters chosen by them. Thus, incorporating a proper algorithm that selects cases that closely align with the filters chosen is crucial in our case.

**6. Are the results of the search query correct? (For example a competitor's search query gives more and better results)**

When presenting the search results, it's hard to balance between accuracy and quantity. Users often want to get less but more accurate results for time saving concern, but they also don't want to miss any single results that are related to the case they are working on.

**7. Orientation in 3D spaces**

The experience of accessing search results on a web page is different from that of accessing search results on a VR. This gives rise to another design challenge since we have to focus on ways to make users feel more comfortable with accessing results, here a list of relevant cases, in a 3D space.

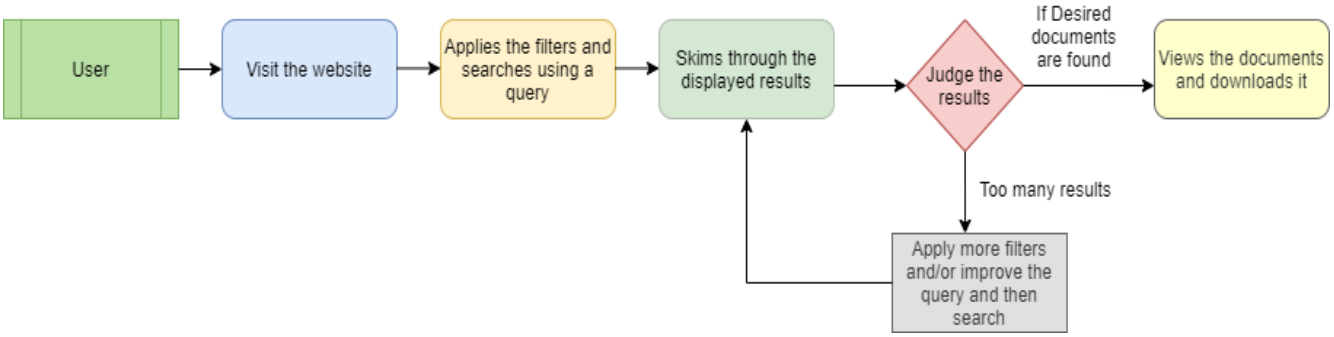
**8. Cyber Sickness**

It is a form of motion sickness that occurs as a result of exposure to VR. Several factors that may contribute to cybersickness are vection, lag, field of view, etc. We need to take these into consideration to ensure good usability of the system.

**9. Making the experience more "immersive"**

It is important to realize that the inclusion of VR in search might prove to be a great innovation and might in fact help give users a good experience in terms of searching for the right cases. Thus, channelizing efforts to improve accessibility of the required functionality on VR, might be a great step towards helping users access results in a way that helps them work better. In this case, we will use VR in a way that helps reduce their stress levels while searching for useful results.

**Experience Map:**



## Expert Notes:

Ms. Jennifer Mclaughlin, LexisNexis' representative and the mentor for this project, explained to us the current scenario of the search query and how they're trying to better the results. After a detailed and insightful discussion with her, along with Dr. Watson, we documented the most important points made through the meeting.

**Goal of the meeting:** Understanding the problem and formulating the problem statement.

Our mentor started this meeting by giving a brief introduction about Augmented Reality and Virtual Reality and how it has moved beyond entertainment. She presented some ideas on how AR/VR could be used in the legal world. She gave examples such as personal training during onboarding and ongoing period in the domain of education. Also, she mentioned this technology can be used for travel and meetings/ collaborations.

**What the current issue is:**

- **Time constraint**
  Lawyers usually have a deadline or a scheduled date before which they need to do their research and gather all the information they need to proceed further. So, time constraint is there and hence we need to provide better and more relevant search results.

- **Better filter criterion**
  Currently the search query gives us too many results which makes it difficult for one to skim through so many documents in a limited time span.

- **Not efficient**
  Relevancy depends on multiple conditions, all of which are factored in the search algorithm, but each lawyer and case has a different condition to use or exploit upon. The algorithm does not consider this which makes us question the relevance of the results.

- **Not a good web page**
  The display of results and associated pages is not interactive or easy to use as of now.

**Challenges:**

- There are so many cases which seem to be relevant, but they aren't for the concerned case. Therefore, it is too difficult to find the exact list of cases a particular lawyer is looking for. Inefficient searching algorithms or inadequate filters might give an incorrect or incomplete list of results to the user.
- Given that the results will be displayed on the VR, we will need to work on how the results would be displayed in the list, and how individual results are displayed. This will be unlike traditional webpages and has several branches to it, not only in terms of how individual cases are displayed, but also in terms of how the lawyers will choose to see multiple pages at once, or how they prefer to see the list of search results etc.

**Previous attempt:** There are no previous attempts for a search engine for legal documents using the AR/VR technology. People are still using web pages or the traditional method of reading each law book in the library.

**Suggestions by expert:**

As per our discussion with our mentor, we realized that the inculcation of VR in assisting with legal searches has a great scope and can help users in several ways - fasten the process of finding relevant cases as compared to doing the same activity in a library, provide better readability of relevant cases, improve the overall experience of going through the cumbersome task of finding and reading through cases.

Jennifer suggested several ways to combat the challenges of searching for relevant cases using VR, some of which are:

- Making the interface more interactive and easier to use.
- Improving the searching algorithm.
- Providing more and relevant filtering criterion.
- Displaying the search results in a way that provides just an adequate amount of information to the user on the first glance, enough for the user to know if that case will be useful for the case at hand.
- Adapting to using a new technology can be difficult, as mentioned by our mentor some users still prefer using a traditional library for searching. Here, incorporating the use of VR can be a rather gruesome task. Thus, making sure that the interface gives the user the same experience of searching as a library, will help realize the goal of the tool.

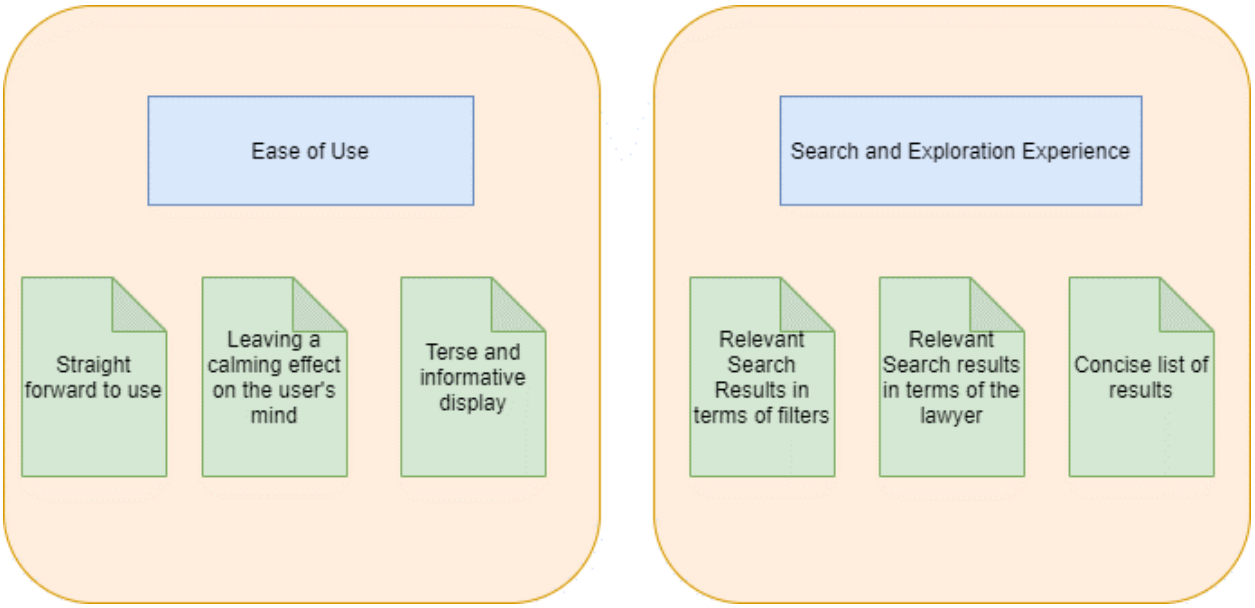
## Problems/Opportunities:

### Ease of Use:

- In our discussion with Ms. Jennifer, we were informed about the stress and the work pressure that comes with the job of a lawyer. This gives rise to the requirement of making an interface which is not only easy to use, but also gives a calming feeling when used. How might we ensure that lawyers can flow through using the AR/VR tool for the purpose of search without facing any technical hassles?
- How might we ensure that using AR/VR while searching does not add to their stress, instead it assures a calming effect on their minds?
- How might we display the search results in a way that could be both terse and informative, and thus of most use when looked at by the lawyer?

### Search and Exploration Experience:

- How might we ensure that search results are relevant to the case at hand?
- How might we display search results that adhere closely to what the particular lawyer is looking for?
- How might we provide a concise list of past cases in accordance with the lawyer's search criterion, instead of providing a multitude of cases which align with the chosen filters?



**Target:**

The lawyers are always under a time crunch when faced with cases and lawsuits as they have to hover and ponder over hundreds and thousands of documents to win a case and be prepared for every kind of situation in the courtroom. Our team will try to focus on making the search and exploration tasks on the Lexis Nexis web page easy for them. Inclusion of Virtual reality in aiding legal searches will help increase efficiency, reduce the cost and time required to complete the task in hand.