Algorithmic Bias and Google Scholar Lesson Plan

Preparation	Meet with professor. Students will learn about Imposter Syndrome before coming to the library. Find "good" bad examples of Google Images and Autocomplete. The web is always changing! Update the worksheets as needed.
Materials	PowerPoint slides, Google Autocomplete worksheet, Google Scholar worksheet, Suggested Readings handout
Student Learning Outcomes	1. Students will be able to search Google Scholar in order to find scholarly and discipline specific sources for their information need. 2. Students will understand Google Scholar's limitations and biases in order to critically evaluate their search results.
ACRL Framework	Information has Value Information Creation as a Process

Introduction		**Time**
	Agenda	
	1. Algorithmic Bias	3 min
	2. Google Scholar	

Google Scholar Search Page		**Time**
	Instructor transitions the students to focus on Google Scholar.	5 min
	"We've talked critically about Google so far and have shown you some distressing results that can occur when you use Google. However, Google isn't a completely flawed product and has lots of productive uses. We use Google in our jobs everyday. So now we're going to show you a productive use of Google by demo-ing Google Scholar."	
	Instructor demonstrates the following areas of Google Scholar	

- Basic search page
- How a basic search works (demo search term: Imposture Syndrome)
- How to find Google Metrics

Instructor does NOT show everything. Do not show student how to look up relevant articles, citation numbers or references. This will be discussed later.

| Google Scholar Metrics | Pass out second worksheet. | **Time** |

With a partner answer the following questions:

10 minutes

- What is the top ranked journal in Engineering & Computer Science?
- What is the top ranked journal in the subcategory of Robotics?
- Look up the article "Undergraduate women in computer science: experience, motivation and culture" by A Fisher, J Margolis and F Miller in Google Scholar. Without looking at the article itself, what are three characteristics you can tell about the article?
- Do you think there is bias in the search results of Google Scholar? Discuss with a partner.

Possible answers for 3 characteristics of the article:
- Its well cited (notable by the # of citations listed on Scholar)
- Its older written in 1997
- 3 authors
- Written in SIGSCE Bulletin
- Done at Carnie Mellon University

Possible Bias of Google Scholar
- Highest ranked articles appear higher
- Journals that have high citation numbers/Hi-5 index numbers are ranked higher in the results
- Older articles come up often if they're highly cited

| Discussion | | **Time** |

Discussion of student's results.
Did they find the top ranked journals?   How was their search experience?

5 min

| Google Scholar | | **Time** |

Using the last question (about Google Scholar bias) as a transition, the instructor explains how Google Scholar ranks articles:

5 min

How Google Scholar Ranks Journals and Scholarly Articles

- Academic Journals are ranked by H5-Index which only includes journals that have published 100 articles and been cited once within the last 5 years
- Articles with high citation counts are ranked highest in results
- Keywords that appear directly in the article title are ranked higher in results
- Google is literal. Synonyms to your keyword are not included in results
- The number of times a keyword appears in an article does NOT matter

Pros of Google Scholar
- Familiar interface
- When on campus, links directly to PDFs
- Includes articles LMU may not own/have access to
- Provides citation counts and links to references
- Citation tools

Cons
- Overwhelming Results
- May provide links to articles LMU does not own/have access to
- May have broken links
- Popular over unique research
- Recent articles rank higher than older

Closing	Get Help	**Time**
	Demonstrate Chat	2 min
	How to request a research consultation	

Assessment

(we did not collect worksheets year 1)
Collect the worksheets and read their responses. This will give us the opportunity to hear from the quiet students who didn't speak up. See where students struggled doing the activity.

The professor sends out a daily survey on all the "soft skills" workshops and the students ranked our workshop from 1-10, and wrote comments.