On Friday October 25th, 2019 120 Bowdoin students who received grants from the college, showcased their research and related work from this past summer. This symposium occurs annually to celebrate the achievements of students across nearly every department. Of these 120 students, seven contributed specifically to the mission of the DCS department.

Learn about their work below:

Student: Griffin Ng '22
Mentor: Crystal Hall, Digital and Computational Studies, Bowdoin College

My goal was to research digital humanities pedagogy events at the college level. I researched online on the Humanist archives, Twitter, Slack, or individual college websites, keeping track of any important data, including the academic rank and department of the instructor, the date of the event, and type of institution that hosted the event. I used R, a programming language for statistics, to make visuals of the data, finding that non-tenure track instructors were playing larger roles than tenure track instructors in pedagogy of digital humanities. For the most part, digital humanities pedagogy events are being taught by people who are not traditionally teaching in the classroom, but are expected to teach at pedagogy events nonetheless.

Student: Jack Backett-Marshall '21
Mentor: Eric Chown, Department of Computer Science, Bowdoin College

This summer, my goal was to create a model using an algorithm known as word2vec, which works by converting words into mathematical vector representations, in order to see if it could be harnessed when translating between English and German. This project involved gathering large amounts of English and German texts, processing them in order to reduce ambiguity, then allowing the word2vec model to learn word representations of words in both languages. I also found a number of insights that could help in machine translation, such as the patterns of how words depend on each other being similar across the two languages, as well as a method of finding pairs of corresponding words in both English and German by comparing with the most common words.

Jairo Izaguerre '22
Mentor: Jill Smith, Department of German, Bowdoin College

Inspired by my seminar on the "Literature and Culture of the Great War and the Weimar Republic" with Professor Smith, I aimed to investigate how men of the "lost generation," those who fought in and survived the First World War, are depicted in the literature and visual works of two separate time periods: the period between the First World War and the takeover of the

National Socialist or Nazi regime (1918–1933) and the present day (2008–present). As the centenary of the First World War approached, I argue, writers, artists, directors, and producers displayed renewed interest in the war and its effects on those who fought in it. This led, on the one hand,to visual adaptations of Weimar-era classics, such as Peter Eickmeyer and Gaby von Borstel's 2014 graphic novel rendition of Eric Maria Remarque's internationally bestselling novel Im Westen Nichts Neues (All Quiet on the Western Front, 1929) and, on the other hand, to new, large-scale productions like the television drama Babylon Berlin.

Student: Kim Hancock '21
Mentor: Mohammad Irfan, Department of Computer Science, Bowdoin College

Diffusion in social networks is the basic idea that the adoption of a product is transmitted between people within a given network; the continued transfer from person to person is known as an information cascade. Our research addresses a recently raised computational question on information cascades in social networks: How do we select a seed set of "initial adopters" that will maximize the payoff of a cascade? Specifically, our model considers overexposure in a social network, where reaching critical individuals can hurt the information cascade by negatively influencing their friends or posting negative product reviews. Maximizing payoff in an information cascade is an NP-complete (NP stands for nondeterministic polynomial time) problem; our goal was to create approximation algorithms for how to maximize payoff in the case of overexposure.

Student: Liam Juskavice '21
Mentor: Mohammad Irfan, Department of Computer Science and Digital and Computational Studies Progam, Bowdoin College

The project involves developing a website for the congressional database that has been created by Professor Irfan's group. Additionally, the website aims to disseminate the group's research results and data. We seek to present information about the US Senate in a user-friendly manner. The information we present is available publicly, but is often difficult to navigate and held in separate files. Our summer work primarily pertained to the "front end" of the website, focusing on improving the appearance of the site itself to make it functional and easily navigable. The website is still a work in progress, and we intend to make it fully operational by the end of Fall 2019.

Luca Ostertag-Hill '20
Mentor: Mohammad Irfan, Department of Computer Science, Bowdoin College

I am working with Professor Irfan (CS) to study social influence in networked multiagent systems. Our research focuses on the US Congress as a real-world scenario of these networked systems, where the voting behavior of a senator is dependent on the primarily positive

influence of senators in their party and the negative influence of senators in the opposition party. This summer we aimed to combine several prior projects (Tucker Gordon '17 and Andrew Phillips '19) to produce a more accurate model for predicting Senate voting. Their work with Irfan allowed the model to take bill context into account when predicting voting outcomes, and clustered bills according to their labels. We were able to complete network analysis on these clusters to determine the sources of high and low polarization in Congress. Future work on this project aims to introduce Probabilistic Graphical Models as a new framework for modeling the network.

Rose Xi '22
Mentor: Stacy Doore, Department of Computer Science, Bowdoin College

There are approximately 12 million people with blindness or visual impairments (BVI) in the United States. STEM conceptual information is often conveyed in visual formats such as graphs, tables, and diagrams, making it difficult for the over 660,000 school-aged BVI individuals to pursue STEM educational and career pathways. This research focused on analyzing natural-language (NL) spatial context cues in order to increase nonvisual information access to STEM graphics. We identified the most salient conceptual and spatial information by using natural language processing (NLP) methods to analyze ~50 descriptions of geometry diagrams from experts in post-secondary STEM instruction. The future goal is to develop a controlled vocabulary to generate automated descriptions of STEM graphics for a remote multi-modal learning support system for BVI students.