Collaborative Research: CNS Core: Medium: How to Scale Up DNA Storage?

BPC Plan

Activity [2] Li Ou, University of Minnesota
Encourage female students majoring in biological sciences to pursue computing degrees

1. Context & Goals

Context: According to the IPEDS data from https://bpcnet.org/statistics/, I investigated the women computing degree recipients in University of Minnesota among three degrees (including Bachelor's, Master's, and Doctoral degrees) along with state and national data as shown in the table below.

According to the table, the situation of women computing degree recipients in University of Minnesota is worse than the state wide and national wide among the bachelor's and master's degrees. One possible reason is the lack of interest and knowledge of computing science.

Gender	Race/ Ethnicity	Inst. Awards (N)	Inst. Awards (%)	State Awards (N)	State Awards (%)	National Awards (N)	National Awards (%)
Bachelor's degree							
men	all	1841	81.03	3876	81.34	140279	80.43
women	all	431	18.97	889	18.66	34137	19.57
Total	-	695	100	4765	100	174416	100
Master's degree							
men	all	427	76.94	505	73.29	45930	69.3
women	all	128	26.06	184	26.71	20899	30.7
Total	-	555	100	689	100	66829	100
Doctoral degree							
men	all	113	75.33	113	75.33	5737	79.75
women	all	37	24.67	37	24.67	1457	20.25
Total	-	150	100	150	100	7194	100

Goal: To increase the number of female students in computing degrees, I will encourage students in my laboratory to pursue computing degrees in the University of Minnesota and other institutions.

Activity Motivation: As a faculty member from the Department of Pediatrics, Medical School, I will not be able to directly increase the recruitment of women students in computing degrees. However, the student body majoring in medicine or biological sciences is relatively balanced in terms of gender. I will leverage my access to female students in the field of medical and biological sciences to help recruitment of female students for computing degrees.

I have been training undergraduates and will encourage female students to pursue an advanced degree in computing if they are interested. More importantly, I will keep female students involved in the proposed project and constantly expose them to latest breakthrough in the field of DNA data storage.

2. Intended Population

Activity Participants: All graduate and undergraduate students in my laboratory and the courses that I teach.

Participant Recruitment: I will invite my faculty colleagues in the Medical school to help, but the students are the intended participants.

3. Strategy

Activity Content: First, I will have at least two female students work on the proposed project if awarded. In this way, these students will be actively involved in computing and data science research. These students will also participate and present their results in the weekly project meetings hosted by Dr. David Du. In addition, I will encourage them to submit conference papers to the {USENIX}Workshop on Hot Topics in Storage and File Systems. If accepted, I will sponsor them to go to these meetings. In this way, they will be able to interact with the broader community of computer science.

Second, I will include discussions on DNA data storage in my weekly lab meetings. I will also invite female students (or alumni) from Dr. Du's group to introduce their academic and industrial experience in the field of computing and data science. These life examples and role models are expected to significantly inspire female students in my group to pursue a degree in computing. The computer science and data science jobs are usually high-paying, especially compared to jobs in biological sciences. This may help attract more students to pursue a degree in computing.

Activity Budget: It is cost-free.

Responsibilities of PIs: I will organize my lab meetings, and coordinate with Drs. Du and Li for project meetings. I will also seek support from my faculty colleagues in the Medical School.

4. Preparation

I have started to include discussions on DNA data storage in my weekly lab meeting. This will provide background knowledge and generate the academic atmosphere in my laboratory. Once awarded, we will be able to jump start the project and implement the BPC plan.

5. Evaluation

I will document relevant discussions in my lab meeting and the project meeting hosted by Dr. Du. The activity of female students on this project and their future positions (especially positioning in computing programs or jobs) will be documented. Evaluation results will be reported in each annual NSF report.