1. **Title:** Statistical Evaluation of E-PACERR Program
2. **Project Description:**
   A. **Description of Project:** The project that I will be undertaking will be an extension of the E-PACERR program, a program that aims to make access to information considered to be outside of formal bioinformatics training more accessible to anyone that might need it. The extension that I will be undertaking is using Python 3 to make a script for data analytics for the E-PACERR Program to ensure that the content is accessible, usable, and meets a certain quality standard that we have set for the program. There is already a Qualtrics survey that has been made to evaluate this criteria and it is placed at the end of the modules for the individuals taking the modules to take. This survey will be placed at the end of all of the modules to be taken after completion of the aforementioned module. In total, there will be 12 modules worth 0.5-credit hours each totalling to the equivalent of two, 3-credit hour classes. In total there will be data from 12 surveys that will need to be analyzed and their results will be measured so we can accurately adjust the modules based on feedback from the users.
   B. **Methodology:** The E-PACERR project's initial deployment is in Fall 2023 so we will have some data by Spring; however, it is likely that the data will be minimal and insufficient for proper analysis. Therefore I will need to create test data in order to develop and test the script to ensure it can accurately analyze the data. The processes that will need to be done to obtain this result are getting test data for the Qualtrics survey and writing a script to parse it. Then I will need to create the functionality so that I can get the statistics and average scores for each question. The last thing that I would like to do is write the results to some sort of file and create a dashboard to display those results. All of this together will be a fully-functional application for analyzing the most recent survey data so that the researchers leading the E-PACERR Program can have easily accessible analysis of the user feedback to evaluate success for all modules in every respect.
   C. **Timeline:** For this project, I plan on starting it in early Spring 2024 and allocating roughly 5-10 hours a week towards working on this project. I believe that it will take roughly 80 hours to complete the project, so I plan on it taking 8-12 weeks to accomplish the goals of this project. This includes the planning, any iterations of development, adjusting for feedback and/or goal realignment, and concluding the project.
   D. **Student/Faculty Mentor Roles:** My faculty mentor for this project would be Dr. Kate Cooper and her role in this would be providing me with the expectations and goals for this project. Her guidance is crucial to my ability to develop an application that fits the needs of the E-PACERR Program. Additionally, Dr. Cooper has provided me with the Qualtrics survey that I am going to need to analyze. My role in this would be the development of the application. This includes setting up the workflow, the parsing of the CSV file, analysis of the data, and creation of the dashboard. We plan on meeting weekly/as-needed to discuss the logistics of the current state of the project and realign short-term goals.

a. Meetings with Dr. Cooper - We currently meet two times a week on Tuesdays for 45 minutes and Thursdays for 15-30 minutes. These meetings are used for discussing the current stages in the project, asking questions, and realigning short-term goals. We plan on staying on this schedule and shifting the focus of some of the meetings towards the project that I am proposing.
b. Resources available to me - Some of the resources that have been provided to me are the Holland Computing Center, a Qualtrics license through UNO, and access to a server on which to download and run Python 3 and assisting libraries. It is likely that for now, the only resource that I will need is the Qualtrics license for the amount of data that we will be using to create this application. In the future, though, we may need to move it to the Holland Computing Center if the amount of data we need to analyze becomes too unrealistic to parse using our local machines.
c. Manuscript writing/editing/review - As a part of this project I will also be assisting Dr. Cooper in writing, editing, and reviewing conference or journal manuscripts to disseminate the results of our work.
d. Dr. Cooper's Role - Dr. Cooper will be responsible for providing regular guidance and goal alignment during our weekly meetings. She will also be ensuring that I have access to the materials and services that I might need to successfully complete this project.

E. No previous internal funding has been received.

3. **Budget and Justification:**

A. No additional materials will be needed, just labor. I plan on working on this project for 80 hours at a rate of $25/hour totalling approximately $2000. I already have a computer, etc. Dr. Cooper has a computer I can use if needed, Qualtrics is provided by university license, etc. There are not any additional resources that I see myself needing to use outside of what has already been provided for me

B. Travel not required.

4. **References and/or Citations:**

A. Attwood, T. K., Blackford, S., Brazas, M. D., Davies, A., & Schneider, M. V. (2019). A global perspective on evolving bioinformatics and data science training needs. *Briefings in Bioinformatics*, *20*(2), 398-404.

B. Via, A., Blicher, T., Bongcam-Rudloff, E., Brazas, M. D., Brooksbank, C., Budd, A., ... & Attwood, T. K. (2013). Best practices in bioinformatics training for life scientists. Briefings in bioinformatics, 14(5), 528-537.

C. Wilson Sayres, M. A., Hauser, C., Sierk, M., Robic, S., Rosenwald, A. G., Smith, T. M., ... & Pauley, M. A. (2018). Bioinformatics core competencies for undergraduate life sciences education. *PloS one*, *13*(6), e0196878.

5. **Letter of Mentor Support:**

University of Nebraska Omaha

School of Interdisciplinary Informatics

September 22, 2023

Dear Selection Committee:

This letter is in regard to Mr. Luke Irwin's FUSE grant proposal for Spring 2023 to the University Center for Research and Creative Activity, entitled "**Statistical Evaluation of the E-PACERR Program"**. The deliverable research and data dashboard will be a part of a conference our journal publication that Mr. Irwin and I will work on addressing the need for training in computational reproducibility.

On behalf of Mr. Irwin's application, I would like to directly address FUSE program requirements:

- Mr. Irwin is and will remain a currently enrolled student at UNO paying fees through Summer 2024.
- Mr. Irwin has identified me as a faculty mentor.
- Mr. Irwin has proposed a FUSE grant project on his own with guidance from me
- Mr. Irwin has indicated his intent and availability to present at the UNO Creative Research and Creative Activity Fair in March 2025.

Student Background and Preparedness: Before working with me in Spring 2023, Luke had an established working relationship with my colleague Dr. Ann Fruhling, and came to my lab with high recommendations and extensive work history at UNO. Luke has already contributed to this research and is well-prepared to complete this work. He has already worked on the E-PACERR project developing a website as described by the grant. This project will allow Mr. Irwin to go outside of the expectations of the E-PACERR project by building an analytical dashboard that helps us determine the effectiveness of the module.

Viability of Project Objectives and Methodology: The goal of this work is to provide a script for analysis and a tool for visualization of E-PACERR curriculum usability. I have worked closely with Luke to ensure he is confident in the methodology and its justifiability/rigor. I have also worked with him to ensure that the proposed work goes above and outside the E-PACERR project goals and objectives, so the work can objectively be his own personal contribution to the work.

Mentor Support to be Provided: I support Luke's research proposal and will guide him in his activities to ensure his efforts benefit the educational process and the research interests of the University. We will continue to meet weekly to discuss his work, troubleshoot code, aggregate data, and interpret results. I will also ensure provision of resources so that Mr. Irwin can focus on this research outside of his studies.

Budget and Costs: Luke's time-spent estimates for this project are reasonable for the work required.

It is my great pleasure to recommend Mr. Luke Irwin be awarded a FUSE grant. I look forward to continuing to work with him in this regard. Please feel free to contact me with questions, comments, or concerns.

Regards,

Kate Cooper
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