**BUDGET JUSTIFICATION**

**University of Pennsylvania**

**Personnel:**

**Benjamin Pierce**, Professor,Principal Investigator (2 months annual effort) The PI will oversee all aspects of the project, including xxxxxxx. The PI will supervise the postdoc, graduate student and other staff to be supported on this grant.

**Andrew Head**, Assistant Professor,Co-PI (x.x months annual effort) The Co-PI will supervise a graduate student.

**Progammer**, TBD (12 months annual effort) The programmer will xxxx ----decribe role.

**Graduate Research Assistant**, TBD (Y1: 3 GRA each 12 months annual effort; Y2-Y5: 4 GRA each 12 months annual effort)) A Doctoral candidate graduate student will be recruited to perform the proposed research and xxxxxxxx.

**2 Undergraduate REPL Students**, TBD (3 months annual effort) Two undergraduate student will be recruited as an hourly lab assistant to xxxxxxxxx.

The University of Pennsylvania reports the effort of the faculty and graduate students as a percentage of monthly effort. The University does not report or record hours or hourly rates for these positions. The effort detailed in this budget is based on an historical estimate of projects of this nature by the PI’s.Funded effort is requested in monthly increments. Therefore 1.0 equals 1 month, 0.5 equals 1/2 month and so on. For purposes of estimating, partial months can be calculated on the basis of an average 22 working days per month. Hourly rates for other categories are based on a 40 hr work week.

**Employee Benefits:**

The employee benefits rates are proposed at **30.5%** for faculty and staff and 9.0% for undergraduate students. These rates are based on our federal rate agreement dated June 24, 2022 and are subject to change. In lieu of any employee benefits, graduate students receive tuition and associated fees (including health insurance) which are also treated as a direct expense to this project.

**Domestic Travel ($9,000/year):**

Funds are budgeted for the principal investigators and/or other project personnel to travel to scientific meetings relevant to the project such as the XXXXXX Conference and/or XXXXXX Annual Meeting. Travel expenses have also been included for the annual PI meetings. The purposes for the travel include dissemination of results and direct interaction with peers in the field. Included in the budget estimate is airfare, registration, hotel, and per diem.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Purpose** | **Destination** | **# of People** | **# of Days** |
| Yr. 1 | Annual PI Meeting | **Washington, DC** | **3** | **??** |
| Yr. 2 | Annual PI Meeting | **Washington, DC** | **2** | **??** |
| Yr. 2 | ICSE Conference | **Austin, TX** | **3** | **7** |
| Yr. 2 | PLDI Conference | **Santa Barbara, CA** | **3** | **6** |
| Yr. 3 | Annual PI Meeting | **Washington, DC** | **2** | **??** |
| Yr. 3 | Strange Loop Conference | **St. Louis, MO** | **2** | **2** |
| Yr. 4 | Annual PI Meeting | **Washington, DC** | **2** | **??** |
| Yr. 4 | ICFP Conference | **St. Louis, MO** | **4** | **6** |
| Yr. 5 | Annual PI Meeting | **Washington, DC** | **2** | **??** |
| Yr. 5 | PLATEAU Workshop | **San Diego, CA** | **4** | **2** |
| Yr. 5 | UIST Conference | **New Orleans, LA** | **3** | **5** |
| **Total Travel Costs** | | | | |

**Foreign Travel ($8,000/year):**

Funds are budgeted for the principal investigators and/or other project personnel to travel to scientific meetings relevant to the project such as the XXXXXX Conference and/or XXXXXX Annual Meeting. The purposes for the travel include dissemination of results and direct interaction with peers in the field. Included in the budget estimate is airfare, registration, hotel, and per diem.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Purpose** | **Destination** | **# of People** | **# of Days** |
| Yr. 1 | ICFP Conference | **Vancouver, Canada** | **3** | **6** |
| Yr. 1 | Lambda Days | **Krakow, Poland** | **2** | **2** |
| Yr. 1 | TFP Conference | **Sophia-Antipolis, France** | **3** | **4** |
| Yr. 2 | ICFP Conference | **Nara, Japan** | **3** | **6** |
| Yr. 3 | FSE Conference | **Bergamo, Italy** | **3** | **5** |
| Yr. 3 | HATRA / OOPSLA | **Vancouver, Canada** | **4** | **6** |
| Yr. 3 | UIST Conference | **Quebec City, Canada** | **4** | **5** |
| Yr. 4 | UIST Conference | **Berlin, Germany** | **3** | **5** |
| Yr. 5 | ICFP Conference | **Berlin, Germany** | **3** | **6** |
| Yr. 5 | Yow! Lambda Jam | **Melbourne, Austrailia** | **2** | **2** |
| Yr. 5 | Koli Calling | **Koli, Finland** | **3** | **4** |
| **Total Travel Costs** | | | | |

**Materials and Supplies** **($4,000/year):**

Funds are requested for materials, set-up and testing of the various experiments, and other expenses related to the specific tasks detailed in the text of the proposal. This includes purchase of instrumentation, and other laboratory materials including glassware, chemicals, etc. as well as computer, computer supplies, peripheral devices, and software to meet the project goals. Details of any specific materials & supplies for this project……

Funds are requested to purchase the following for the project:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Items** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| Describe Supply Item/Category | $ | $ | $ | $ | $ |
| Describe Supply Item/Category | $ | $ | $ | $ | $ |
| Describe Supply Item/Category | $ | $ | $ | $ | $ |
| Miscellaneous Supplies | $ | $ | $ | $ | $ |
| **Total Supply Costs** | **$4,000** | **$4,000** | **$4,000** | **$4,000** | **$4,000** |

**Other Direct Costs - Graduate Student Tuition and Fees ($60,045 Y1, $83,264 Y2, $86,596 Y3, $90,060 Y4, and $93,664 Y5):**

Tuition is included for the graduate research assistant(s) for the equivalent of 3 courses per term in the academic year for each student. As explained in the salary & benefits section, tuition and fees are provided to graduate research assistants in lieu of employee benefits.

**Indirect Costs (F&A):**

Indirect costs are budgeted at **62.5%** per agreement dated June 24, 2022. Indirect costs are applied to a modified total direct cost base. The base is the sum of total direct costs, less the cost of equipment, tuition and that portion of any subcontract that exceeds $25,000. *(There are no subcontracts proposed for this project.)*