

Graduate/Undergraduate Research Assistant - Fall 2021

The SEIRS+ COVID Modeling Team at UW is seeking multiple **graduate** and/or **advanced undergraduate** research assistants for **Fall 2021** to contribute to the development of network epidemiology modeling frameworks and the application of these models to the study of active problems in the COVID pandemic. These positions will work on problems of immediate public relevance with opportunities for open source tool development and possible publication.

About the SEIRS+ COVID Modeling Team

Our team developed the SEIRS+ modeling framework (<https://github.com/ryansmcgee/seirsplus>) to provide a flexible platform for implementing sophisticated epidemiological models that incorporate important aspects of disease dynamics, such as stochasticity; heterogeneities in disease, transmission, and behavioral parameters; and the structure of contact networks. SEIRS+ is an open-source Python framework that supports customizable implementations of infectious disease models on stochastic dynamical networks. SEIRS+ has been used by multiple groups to study and inform mitigation strategies in workplaces, universities, K-12 schools, and nursing homes. Notably, we collaborate directly with Color Health to produce model-driven web tools to aid the design of COVID testing plans.

Objectives

The Rockefeller Foundation's COVID Modeling Accelerator has provided support for further development of the SEIRS+ modeling framework. The proximate objectives for SEIRS+ development in Fall 2021 include 1) extending the COVID model to include factors relevant to the pandemic in 2021-22; 2) using the COVID model to investigate active questions; 3) generalizing the SEIRS+ framework to support flexible epidemiology research beyond COVID; and 4) expanding the user base among decision makers and researchers. An associated methods and case study paper is to be submitted by the end of the accelerator period. Other research activities may result in papers, reports, or web tools.

Job Description

The following duties will be delegated across multiple research assistants according to their interests and skill sets. Applicants need not have interest or experience in all of these areas to be competitive.

<u>Responsibilities</u>	<u>Associated skill sets</u>
1. Implement and test new SEIRS+ features.	Intermediate Python proficiency, software development
2. Optimize SEIRS+ model runtime and design.	Advanced Python proficiency, software development; Familiarity with the Gillespie algorithm and associated stochastic simulation methods a plus
3. Perform model simulations for SEIRS+ case studies and COVID research questions.	Basic-Intermediate Python proficiency; familiarity with Hyak HPCC, AWS, or similar a plus
4. Document new SEIRS+ models and features (e.g., on Github wiki).	Basic Python proficiency, technical writing for broad audiences
5. Manage the SEIRS+ Github (e.g., triage and address issues, pull requests, user questions).	Basic-Intermediate Python proficiency, familiarity with git version control and Github

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| 6. Develop tutorials, interactive notebooks, etc. to increase accessibility of SEIRS+ simulations for less-technical users. | Basic-Intermediate Python proficiency, familiarity with Jupyter notebooks and/or similar tools. |
| 7. Survey COVID literature to identify potential questions of interest and inform model parameterizations and other updates. | Proficiency in finding and reading scientific/medical literature; Background in epidemiology or COVID research a plus. |
| 8. Identify and reach out to researchers and decision makers who might benefit from using SEIRS+ tools or interfacing with our group. | Familiarity with COVID research and/or decision-maker landscapes a plus |

These positions are full remote. Meetings will be held on an approximately weekly basis on Zoom.

Hours & Compensation

<u>Graduate Students</u>	<u>Undergraduate Students</u>
UW Graduate Student Research Assistantship funding for Fall Quarter 2021 (50% FTE, GSA stipend rates, benefits, etc.) - OR - Up to 20 hrs/week at \$30/hr for up to 15 weeks within Oct 11 - Jan 30	Up to 20 hrs/week at \$20/hr for up to 15 weeks within Oct 11 - Jan 30

How to Apply

To apply, please send the following items to Ryan McGee at ryansmcgee@gmail.com:

- Brief statement of interest and qualification. Please explain:
 - How do your interests align with the overall objectives of the SEIRS+ Modeling Team?
 - Which of the specific responsibilities listed above are of particular interest, and how do your background, experiences, and skill sets prepare you for those tasks?

Note: Applicants are not expected to have interest or experience in all of the listed areas. In general, genuine depth of interest and proficiency in select areas is beneficial.
- CV/Resume
 - Including undergraduate/graduate status, year, major, and department, as applicable
 - Including any previous research or job experience
- Your interest in RAship vs hourly appointment (for graduate students), and the number of hours/week you are interested in committing to this work (for hourly appointments).

Applications are due by October 6. Initial decisions will be sent out October 7, and prospective candidates will be asked to schedule a follow up Zoom interview on Oct 8 between 11am-3pm PT. Final decisions and onboarding of hired research assistants is expected to take place the week of October 11.

Thank you for your consideration. We look forward to hearing from you!

Carl Bergstrom
Professor, Biology
University of Washington

Ryan McGee (ryansmcgee@gmail.com)
Postdoctoral Research Associate, Physics
Washington University in St. Louis