

## Research Assistant - data engineering and data science (intermediate to advanced Python)

## Job Description

**Introduction:**

We are looking for an **independent and professional student** with at least **intermediate knowledge of Python** and **familiarity with software/data engineering practices**. Your responsibilities will include data engineering (65%) and data science (35%) tasks.

**About you:**

- **Required:**

You are an intermediate to advanced Python programmer.

You write reusable, well-documented code (design doc, docstrings, comments), and you know how to collaborate using git.

You have some familiarity with data science packages such as pandas.

You can quickly pick up new technologies.

You are responsible, professional, and can work independently.

- **Good to have, but not required:**

Ideally, you know how to use type annotations (mypy) and write tests (pytest); alternatively, you will have to learn these skills; I can give an introduction.

You have some familiarity with Android development; otherwise, you will have to learn the basics of Android Studio, Android Activity Lifecycle, and Sensors API to be able to analyze such data.

Some experience in one or more of the following would be helpful: algorithm development, data science, statistics, and network science.

**About the job:**

- At least 80% of the time, you will work on a **variety of software development tasks**. These tasks may include data processing and quality assurance, algorithm implementation and development, and data visualization.

- **Examples of specific tasks:**

Develop a pipeline for processing 11 types of CSV files and producing participant-level data streams.

Create a dashboard for monitoring the quality of incoming data and the pipeline's health.

Create or implement an algorithm for anomaly detection.

Implement an existing Bayesian algorithm for inferring sleep duration from smartphone data.

Create network representations of selected time series data streams, explore various approaches to analyzing them and visualizing the results. We would probably use pathpy, netrd or similar packages.

Test whether the data collection app records the data correctly.

- Very rarely, I may ask you for help with administrative tasks. These tasks will never take

more than 20% of your time. I will try to minimize them unless you explicitly ask me for more of them.

- If we are both satisfied with our collaboration, **our work can extend into the Fall.**

### About the project:

- Together with professors from Khoury, Electrical and Computer Engineering, and Bouvé, I am developing a cutting-edge technology ("a digital biomarker") to monitor cognitive function changes in persons with cognitive impairment. The produced health metrics are to be used by doctors to evaluate and personalize patients' treatment plans.
- Data used in this project are multiple time series coming from Android phones. The time series include behavioral data (what apps people use, when, for how long; frequency of typing errors, etc.) and sensor data (location, activity recognition, etc.).

### Compensation:

- I anticipate you will work **20 hours/week on average**; modulo your exams, etc. In limited circumstances, it might be possible to work **40 hours/week** in the summer. Talk to me, if you are interested in this option.
- If your performance meets all expectations, **your compensation will most likely increase after the first 80 hours of work.**
- You will be hired to complete various computational tasks within a certain number of hours. You will be paid for the number of hours we both agreed that a given task would take you. If you complete a task in fewer hours than anticipated, you can spend the remaining time on your own projects.
- You can work remotely with check-ins via Zoom and Slack.

### Other benefits:

- If you are interested, I will be happy to mentor you in data science, research, and advise you on finding internships, co-ops, and applying to grad school or doctoral programs.
- I can arrange for additional mentorship opportunities for students with disabilities.
- The faculty involved in this project will be happy to write Letters of Recommendation.
- There will be co-authorship opportunities for students interested in submitting a research paper for publication.

### How to apply:

- Submit your resume as a PDF, listing relevant experience and software projects, ideally with links to code samples or repos.
- Keep your resume under 2 pages, unless you are a Ph.D. student.
- Put your email in the first two lines of the resume.
- Name your resume using the following format: First name Last name - resume - 2022 - FOCI project.pdf

For example: Alex Doe - resume - 2022 - FOCI project.pdf

**Next steps:**

- I will send a short programming assignment to the selected applicants. It should take under one hour to complete if you are at the appropriate skill level.
- Following the successful completion of the assignment, I will invite you for a low-stress interview via Zoom. We will chat about your experience and interests, do a pair programming exercise together, and I will answer your questions.

**Category**

Research/Research Assistant (Student Job Posting Category)

**Additional Information**

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To learn more about Northeastern University's commitment and support of diversity and inclusion, please see [www.northeastern.edu/diversity](http://www.northeastern.edu/diversity).

## Job Details

**Job Requisition ID** R106373  
**Location** Boston, MA (Main Campus)  
**Posting Date** 06/01/2022 - 1 day ago  
**Job Family** On Campus Non Work Study (ST)  
Research Support  
**Time Type** Part time  
**Job Type** Student (Fixed Term)  
**Supervisory Organization** PhD Network-JM (Maciej Kos)

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