



# SONIC Data Science Internship Opportunities Fall 2022

**Course Credit:**

Research Practicum registration #: 389 (COMM\_ST)

Independent Study registration #: 399-0 (IEMS), 399-0 (CS) and 499-0 (CS)

**Duration:**

Fall 2022 (with the possibility to continue)

**Location:**

In person or Remote

**Organization Overview:**

The Science of Networks in Communities (SONIC) research group advances social network theory and methodology through the development of cutting-edge techniques to understand and enable networks in diverse communities. For more information, please visit

<http://sonic.northwestern.edu/about>

**Internship Opportunities:**

SONIC is excited to offer the internship opportunities this quarter:

- Car Project (details below)
- Kenya Project (details below)
- Science of Science Project (details below)
- Project RED (details below)

**Requirements:**

Data Science Internships are open to current undergraduates or graduate students enrolled in an accredited degree-seeking program at Northwestern. Candidates must be able to demonstrate attention to detail, proficient writing/communication skills, analytic thinking, and emphasis on deadlines. Candidates must commit to attend weekly lab meetings in-person or virtual. Many projects require candidates to have at least basic knowledge of programming or statistical software. For project specific requirements and preferences, see descriptions below.

**Application Instructions:**

For general questions about the internship and the SONIC research group, please complete this [Google form](#) and contact Dorothea Boyle, at [dorothea.boyle@northwestern.edu](mailto:dorothea.boyle@northwestern.edu) for questions.



## RESEARCH OPPORTUNITY: Car Project

### Organization Overview:

The Science of Networks in Communities (SONIC) research group advances social network theory and methodology through the development of cutting-edge techniques to understand and enable networks in diverse communities. For more information, please visit:

<http://sonic.northwestern.edu/about>.

### Description:

This project aims to understand how consumers' preferences and social networks can be used to predict their car consideration and purchase decisions, and how these decisions can help car manufacturers make better car design decisions. Intern responsibilities:

1. Data Cleaning: Write R code to process survey data (obtained in .csv format) and reformat into a workable data structure
2. Modeling: Re-write existing R code to run bipartite ERGMs (predicting consumer-product relations)

### Required Qualifications:

This position is open to current undergraduates or graduate students enrolled in an accredited degree-seeking program at Northwestern. Candidates must be proficient in R.

Departments: IEMS, CS, MMSS, or other departments

Education level: Undergraduates or Graduates

### Preferred Qualifications:

Interest in or prior experience in social network analysis (e.g. ERGMs, ALAAM) is strongly preferred. Completed COMP-SCI 396, IEMS 341, or COMM ST 352 (Social Network Analysis). Experience with data analysis and statistical analysis.

### Application Instructions:

Please complete this [Google form](#) and send a resume and brief cover letter describing your interest in the position to Neelam Modi ([neelammodi@u.northwestern.edu](mailto:neelammodi@u.northwestern.edu)).



# RESEARCH OPPORTUNITY: Kenya Project

## Organization Overview:

The Science of Networks in Communities (SONIC) research group advances social network theory and methodology through the development of cutting-edge techniques to understand and enable networks in diverse communities. For more information, please visit:

<http://sonic.northwestern.edu/about>.

## Description:

This project aims to understand how social networks and human social motives are used collectively to enact social influence within a community. Intern responsibilities:

1. Data Cleaning: Write R code to process survey data (obtained in .csv format) and reformat into a workable data structure
2. Modeling: Re-write existing R code to run ALAAMs

## Required Qualifications:

This position is open to current undergraduates or graduate students enrolled in an accredited degree-seeking program at Northwestern. Candidates must be proficient in R.

Departments: IEMS, CS, MMSS, or other departments

Education level: Undergraduates or Graduates

## Preferred Qualifications:

Interest in or prior experience in social network analysis (e.g. ERGMs, ALAAM) is strongly preferred. Completed COMP-SCI 396, IEMS 341, or COMM ST 352 (Social Network Analysis). Experience with data analysis and statistical analysis.

## Application Instructions:

Please complete this [Google form](#) and send a resume and brief cover letter describing your interest in the position to Neelam Modi ([neelammodi@u.northwestern.edu](mailto:neelammodi@u.northwestern.edu)).



# RESEARCH OPPORTUNITY: Science of Science Project

## Organization Overview:

The Science of Networks in Communities (SONIC) research group advances social network theory and methodology through the development of cutting-edge techniques to understand and enable networks in diverse communities. For more information, please visit:

<http://sonic.northwestern.edu/about>.

## Description:

This project aims to evaluate changes in scientific collaboration ecosystems over time in response to exogenous shocks. Intern responsibilities include parsing through large datasets (stored in mysql db) in order to:

1. identify scientists' prior publications and/or patents
2. extrapolate scientists' prior collaboration networks
3. decode scientists' areas of expertise using text analytics tools for mining the text contained in scientific publications

## Required Qualifications:

This position is open to current undergraduates or graduate students enrolled in an accredited degree-seeking program at Northwestern. Candidates must be proficient SQL, R, and Python

Departments: CS or other departments

Education level: Graduates

## Preferred Qualifications:

Experience with SQL and R or Python programming languages. Interest in gaining data science experience (from data pre-processing to creation of knowledge). Interest in social science research, specifically studying scientific collaboration, teams, and social networks.

## Application Instructions:

Please complete this [Google form](#) and send a resume and brief cover letter describing your interest in the position to Neelam Modi ([neelammodi@u.northwestern.edu](mailto:neelammodi@u.northwestern.edu)).



## RESEARCH OPPORTUNITY: Project RED

### Organization Overview:

The Science of Networks in Communities (SONIC) research group advances social network theory and methodology through the development of cutting-edge techniques to understand and enable networks in diverse communities. For more information, please visit:

<http://sonic.northwestern.edu/about>.

### Description:

This project aims to model optimization-based performance metrics for individuals, teams, and teams-of-teams (multi-team systems) from space simulations. Intern responsibilities:

1. Run python code on a remote computing cluster to analyze data
2. Re-write / optimize python code for solving optimization problems

### Required Qualifications:

This position is open to current undergraduates or graduate students enrolled in an accredited degree-seeking program at Northwestern. Knowledge of Python & AMPL is required.

Departments: IEMS, CS or other departments

Education level: Undergraduates or Graduates

### Preferred Qualifications:

Interest in or knowledge in optimization is strongly preferred. Completed IEMS 313 (or knowledge of Linear Programming. Experience using command line/Bash.

### Application Instructions:

Please complete this [Google form](#) and send a resume and brief cover letter describing your interest in the position to Megan Chan ([Megan.chan@u.northwestern.edu](mailto:Megan.chan@u.northwestern.edu)).



## RESEARCH OPPORTUNITY: Project RED

### Organization Overview:

The Science of Networks in Communities (SONIC) research group advances social network theory and methodology through the development of cutting-edge techniques to understand and enable networks in diverse communities. For more information, please visit:

<http://sonic.northwestern.edu/about>.

### Description:

This project aims to model and predict performance for individuals, teams, and teams-of-teams (multi-team systems) using social networks. Intern responsibilities:

- Use R to develop and run ALAAM models

### Required Qualifications:

This position is open to current undergraduates or graduate students enrolled in an accredited degree-seeking program at Northwestern. Knowledge of R is required.

Departments: IEMS, or other departments

Education level: Undergraduates or Graduates

### Preferred Qualifications:

Interest in or knowledge in social network analysis.

### Application Instructions:

Please complete this [Google form](#) and send a resume and brief cover letter describing your interest in the position to Megan Chan ([Megan.chan@u.northwestern.edu](mailto:Megan.chan@u.northwestern.edu)).