

CS 3950 Introduction to Computer Science Research

Northeastern University, Winter 2020

Homework 1

Due 1:30pm Thursday Jan 16

Please submit your written solutions as a PDF file that does not exceed 2 pages. Submission site is announced on course webpage .

In this assignment, you will take an online “field trip” to explore examples of Computer Science research taking place in Northeastern’s Khoury College. Begin your field trip by visiting <https://www.khoury.northeastern.edu/research/research-areas/>. Pick two research areas that interest you most under the following constraint:

- Pick **one** of the following: Machine learning, Artificial intelligence, Robotics, Data science (Data Lab), Formal methods, Games, Natural language processing & Information retrieval Network science, Personal health informatics, Human-centered computing
- Pick **one** of the following: Programming languages, Formal Methods, Security, Software engineering, Systems and networking, Algorithms & theory

For each area, click on the link for the area to load the research area’s landing page. Take some time to read through the page (particularly the introductory text) and skim through the news articles, recent publications, and projects.

Now navigate to the part of the page that lists people affiliated with the research area. While you are welcome to click on anyone to learn more about their research, the most structured information comes from the pages corresponding to Ph.D. students. These pages contain concise answers to questions about research interests, a key problem they are tackling, and sometimes a little information about the methods they use.

Use what you learn from these pages to answer the questions below. You are welcome to use online resources to look up technical terms you do not understand, and to get a better idea of what each research area entails.

Hint: When evaluating whether a topic is science, engineering, and/or math, consider the following questions. Is it empirical work (*i.e.*, there are measurements)? Does the research entail building artifacts that are practical/useful? Does the work entail understanding/proving mathematical limits of algorithms? This list of questions is not exhaustive, but should be useful for classifying research in many cases.

1a. Research Area:

List 2-3 research topics below. Number them so you can reference them in part (b). (20 pts)

1b. For each topic, answer the following:

Is it science? Explain your reasoning:

Is it engineering? Explain your reasoning:

Is it math? Explain your reasoning:

(30 pts)

2a. Research Area:

List 2-3 research topics below. Number them so you can reference them in part (b). (20 pts)

2b. For each topic, answer the following:

Is it science? Explain your reasoning:

Is it engineering? Explain your reasoning:

Is it math? Explain your reasoning:

(30 pts)