CSc80020
Computer Science Research
Graduate Center, CUNY
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Meeting times: Thursdays, 4:15pm-6:15pm, Room 5383

<u>**Rationale:**</u> The Computer Science Ph.D. Program aims to prepare its students to become outstanding scholars and leaders in both industry and academic institutions in the broad field of Computer Science and Technology. To achieve this goal, one of the most important skills that students must develop during their PhD study is the ability of doing and communicating innovative research. That is, to be able to learn from existing literature, identify unsolved problems, propose inventive and effective approaches to solve the problems, communicate and present their work before others, and publish their research in well-established professional journals and conferences.

<u>**Course Description**</u>: The main purpose of this course is to allow a reasonable number of credit hours for a student to work on his/her Thesis research. This course will be conducted flexibly, with the ultimate goal of having each of the registered students working on his/her thesis related research project for a minimum of 80 hours a semester and present their research to the class. The evaluation metrics include extensive literature survey, production of conference and journal papers, publishable research work, and project results being ready for submission.

<u>**Learning Goals/Outcomes:**</u> The students will gain ability to conduct research, become familiar with their field, learn to present a coherent explanatory talk, and produce publishable research results.

<u>**List of Topics:**</u>

1. Choose a topic of research in any area of Computer Science in consultation with the course instructor and/or the PH.D. mentor. Write an introduction/topic paper to introduce the field of study to a newcomer. This paper should be a brief description of the research topic, applications if any, and its current status. Prepare 10 minute presentations to introduce the topics to their peers.
2. Select three or four representative/classic papers in the field of interest and perform thorough critical analysis/peer review of these papers. Write the review outlining the purpose, strengths, weakness and contributions of each paper. Explain the threads that tie the selected papers together. Prepare 15 minute presentations to explain the analysis to their peers.
3. Write literature surveys of the selected research area. In order to perform the survey, students will research the topic from its roots to the current state of art. While a survey can be done in several ways, one of the suggestions is to first perform a chronological survey and then look for a theme that can tie the history with the research the student intends to pursue in his/her dissertation. Thus, divide the research topic in several periods, e.g., computer network protocol was proposed around 1960s, since then its already been almost 60 years. Divide 60 years into 5

periods as follows, 1960-1972, 1973-1985, 1986-1998, 1999-2011, and 2011-2015. For each period, research its important developments, the state of the art, important failures and contributions. The topics can also be divided by identifying important milestones in the research area. For each period, choose several representative papers to write brief summaries to build a chronological account of developments in the research area. In general, this can be done by writing a brief summary of the paper, the strengths and weakness, and importance of the paper in advancing the research in the field.

Assessment:

The student learning goals will be evaluated based on the following criterion:

Objectives	Weight
Topic Paper and Presentation	10
Second Paper and Presentation	20
Survey Paper First Draft and Presentation	20
Survey Paper Second Draft and Presentation	20
Survey Paper Final Paper and Presentation	10
Class Participation (Based on feedback to and from peers)	20

Participation and discussions are critical in this course in order to meet the learning objectives for each student.