

Finding Suitable Research Topic And Describe the Research Problem in Computer Science

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Abstract—One of the hardest problem of doing research in any field is to select a research problem. Computer Science related research has also the same issue. Over the last two decades, Computer Science has continued to leverage as research field. In this paper we would like to discuss about finding a research problem and process of stating the problem in professional manner.

I. INTRODUCTION

Computer Science is firstly growing field fueled by emerging domain areas and improving hardware and software bottlenecks, but creates new opportunity for the computer science research field. According the the number of published papers and journals in the field of computer science is growing further. But still we face to select a research topic in computer science.

Since a research problem is usually something you should have some knowledge, that personal experience is a starting point for selecting a research problem. In real cases you have to select something that you are interested in, this will give you energy to work on the problem. As research takes long time to resolve, if you do not have interest on the subject matter, soon you will get demotivated and will be difficult to sustain. After selecting a research area you may read publications, discuss with seniors, attend research talks to identify specific interest withing the broad research area.

II. FINDING SUITABLE RESEARCH TOPIC

A. Background Research

Background study will help you to develop your topic and can even change your interest. Although it seems to have extra work in real cases it is time sever as you are doing some background study before engaging into research work. Your undergraduate course work may be helpful to background study and select a broad area of research.

B. Brainstorm Concepts

Once after selecting broad interest you can brainstorm pin point on the topic. For example if your interested in "Neural Network Performance Optimization" you need to get pin point idea about Neural Network and Performance issues if Neural Network. The amount of reading will give solid base on the topic. Now there is a concern the process of reading. If you are interested in specific field you can ask seniors about top

publication withing the research area. Even there ate ACM or IEEE publication in different research area and you can study on those are influential in the field of study.

C. Develop a Research Question

Once after selecting broad topic and doing background research, research question and answer to those can be helpful to define the research problem. Questions can be as follows:

- Why is the topic important?
- What solutions are available for the topic?
- What are hurdles to solve the problem?
- What are the concepts of the topic?
- What will be impact of the research?

D. Focus in on your topic

A research topic will be difficult to work if it too large or too narrow. So, try to focus on the topic whether it is too vast or too short. Keep the topic manageable so that it can be completed within time with originality. A topic will be more difficult to research if it is too broadly interdisciplinary and locally confined.

E. Be Flexible

It may happen that while doing research, research topic can be modified. You may find too much and need to narrow your focus, or too little and need to broaden your focus. This is a normal part of the research process. Even your supervisor may think of different project. So, do not be stick to on point, rather think of broad area of your interest.

III. FORMULATING A RESEARCH PROBLEM

At this point you know the problem well and you might have idea to solve the problem. But it is too early to start on your hypothesis, rather you should think in different approaches and hypothesis. This will help you to protect from biased to be your own solution.

A. Search for Solution

Compile list of possible solutions to overcome the problem filter bases on the requirement and performance of your research problem. A better approach is to prepare an abstract view of the solution that be presentable to others.

Another approach is to find solution of related problems and their approach to solve the problem [?]. You should read

relevant paper to get idea about solving the problem. Once idea searching is done, you have list of ideas and now can start solving the problem.

B. Try with Different Ideas

It is now time pick a promising idea from list of ideas to solve the research problem. Compare merits and demerits of each approach to solve the problem. The act of comparing ideas forces you to be explicit about why you prefer one idea over the other. Trying with different solutions will help you to find winning idea and an important property of winning solution is its conceptual simplicity.

C. Implementation of Preferred Solution

After looking at different solutions we can start with preferred solution. The key thing is to start with small implementation and check whether it works for the research problem. For evaluating check with controlled environment and data set. If it works well with controlled environment then it should be tuned to work with real environment and evaluate the system

D. Go Further with The Research

After implementation and writing paper, the task of research not yet completed. We should study and work further for the improvement of the implementation. Find corner cases of existing implementation and solve the solution. Also incorporate new algorithms and may extend the work another problem cases.

IV. CONCLUSION

Good research processes help avoid common mistakes, minimize frustration and help to achieve goals in systematic way. In this paper we mentioned about the issues before selecting research topic and also discussed about working with such research problems.