

Homework 1
Research Seminar
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The answers are based on a discussion with Dr. Matt Gibson.

1. How do you start a research project?

In algorithm, you need problems to work on. I read a lot of papers, attend conferences, talk with colleagues and I find problem to work on that seem interesting. Then I read more on those and try to solve something that still open.

2. What specific tools do you use?

In my research, I just use the tool which is 'paper' and try to solve new problems. I need computer software to write the papers and programming languages to implement some algorithm.

3. How did you gain your expertise with the various tools you use?

The main tool in algorithm is the 'technique'. I read a lot of papers to learn techniques and apply them to get the solution. I just need to make sure that I understand the technique very well.

4. What are some important experiences you suggest for a novice researcher?

It's very important to read a lot of papers and understand the paper as well as the author of the papers. Then try to learn about the techniques and pick up the open problem.

5. If I want to learn how to become a competent researcher, what specific tools would you suggest I work with?

Students should read and should get stuck on some aspects. Students should talk with their adviser to get unstuck. Should learn lots of techniques and open problems.

6. What are the difficulties you think that hinder your research?

In algorithm, there are lots of theorems to prove. Proving theorem seems very difficult. Sometimes problems become more difficult than our intuition.

7. Do you have any advice to improve writing skills for those who are not native speaker of English?

Practice. It's good to make mistakes and get the mistakes fixed. Reading a lot should help as well. Also writing and getting feedback on writing should always help.

8. How do you use hypothesis in your research?

We don't really have hypothesis and standard scientific method. But we have an idea what might work. But that is not like hypothesis. We do not propose hypothesis and prove that. We just have

intuition that what might work and then we proceed based on that intuition.