**ScholarX – Dr. Kasun Bandara’s session on developing research skills**

First of all, I would like to say that I was fortunate enough to get selected to the mentoring group of Dr. Kasun Bandara, a data scientist and a doctoral researcher at University of Melbourne. He is a friendly person who is sharing his expertise with us.

The last session he conducted about developing good research skills is an interesting topic of us. He shared some of his supervisors’ presentations to give us a better idea. I will brief the main points he emphasized during his talk.

A research project is different from a normal project due to several reasons. In a project, we already know the outcome. But in a research knowledge is the outcome and whether the final results is positive, negative is unknown before the research. Even a failure can be a good research unlike a project. At the end of the research paper, in conclusion and future work sections, these results can be mentioned. So future researchers know in which circumstances this is not working and they can avoid those methods. Furthermore, research push the boundaries of knowledge filling a research gap with the purpose of improving the world.

Some researchers are merely targeting publications to improve their personal profile and to gain experience. Since the taxpayer’s money is used for research, they must be a service to the society.

First step in doing a research is identifying a problem. There are several ways to get a motivation in a specific area. They can be forming a literature review or similar studies or from someone’s own experience. Problems can also come from industry, especially application research. These application research applies theoretical knowledge to a practical problem and see the results. We should focus and a specific area and read all the work related to it. After a thorough literature review, we must find a research gap in the area. Finding a fresh area is critical because everyone who will be exploring or developing that area in future will have to cite the first few papers. People usually stick to one specific area so they can exploit the area and update themselves easily.

The outline of a research publication includes Introduction, Problem Definition, Related Work (Literature), Design/Architecture, Experiments, Discussion and Results Analysis, and Conclusion.

There can be several challenges when doing a research. Someone else may publish a similar research while you are working on it. These situations can be avoided by working in a specific area, so you know the other people who are also working in the same area and what their current research are. If something like that happens, there are still several ways to publish your work by addressing limitations in their work or running in several datasets.

Citing is one of the important factors to consider when doing a research. Showing other peoples work as one’s own work is an academic crime. Therefore, we have to cite all the resources, knowledge collected from other peoples’ work. When citing related work, we have to choose the important work. In addition, we must read all the papers (at least the abstract) which are sited in our work. Some packages and software used should also be cited. There are citation management software like Mendeley (free and open source) and Zotero. I started working with Mandalay and Latex in my Project Reports and it save lots of time and effort.

Scripting is another vital part in modern research. It is important our work can be reproducible. Someone else should be able to execute the same project without guessing the software, methods you used. Therefore, it is better to publicly publish all the codes in GitHub. In some conferences, journal they it is mandatory to publish all their source codes. This sharing of knowledge helps future research immensely to push the knowledge boundaries.