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Research in Computing

Introduction

A systematic investigation carried out to uncover the unknown, interpret, bring a new perspective, or simply revise theories about a specific subject or phenomenon is referred to as research. Marcus Aurelius[1] said that "Nothing has such power to broaden the mind as the ability to investigate systematically and truly all that comes under thy observation in life." So if we know how to make research properly, everything related to our work would be worthwhile and easier.

There are several areas where research can be done, and computer science is one of them. Science is derived from the Latin term *scientia*, which means 'knowing something'. Computer science is one of the sciences of our modern world. It examines computers and how they work, including their hardware, software, and algorithms. So in this essay, we will examine several aspects of research in computing.

Computer as a Science

Despite its growing significance, some scholars state that computing is still an immature field. Computing is widespread and derives from many professions. As DODIG-CRNKOVIC claimed, sciences are connected to each other in a prerequisite way and they are communicating. Also, he emphasizes this sentence: "Logic of science is recursive.". It refers *to the scientific method* which includes several steps for seeking solutions to issues brought by science. Recursive logic is valid for these steps. [1] There are similarities between computing and other fields of science. We can say that the essential aspects of computers are mathematics and engineering.

Disciplines of Computing

In today's modern world, computers are everywhere and have an essential role in our lives. So this wide-ranging area leads to various disciplines in the computing field. Glass et al. stated that computer science (CS), software engineering (SE), and information systems (IS) are the three most common academic subfields within the computing field. [2] This split is easier

[1] Marcus Aurelius Antoninus was a Roman emperor from 161 to 180 AD. He was also a Stoic philosopher.

to understand when we consider their distinctions. Computer science (CS) focuses on computer concepts, such as operating systems, networks, and hardware systems. Whereas IS focuses on organizational concepts more inclusively. And SE is more concerned with software concepts and production processes. Also, it is possible to see them in the same category concentrated such as systems/software category. This separation is noticeable in the curriculums of academic fields. So people choose their study area based on this. It is quite a wide area to find a suitable subject to work on it. The requirements percentage also changes depending on the field. One should make wise decisions on what to concentrate on.

Methods and More

Humans cannot multitask like a machine, so we must concentrate on what we want to master. This is one of the essential parts of research. Then we may focus on the methods. Speaking of method, although the terms "method" and "methodology" are sometimes used synonymously, Hassani believes that they are different. The term "method" means the approach and procedure performed to carry out research. On the other hand, "methodology" is a scientific approach that examines, compares, and discusses the various ways that research may be conducted alongside various methods.[3]

Research requires careful method selection however there is no established, widely used mechanism that supports computing research. Research is grouped into three main categories by Baban (2009): The application of the research study, the objectives in undertaking the research, and the type of information sought. And these titles are divided into sub-titles and detailed. For instance, the application category is divided into 2 subcategories which are pure and applied research. Pure research reveals new ideas and ideologies. Applied research is about solving a specific issue in the field. [3]

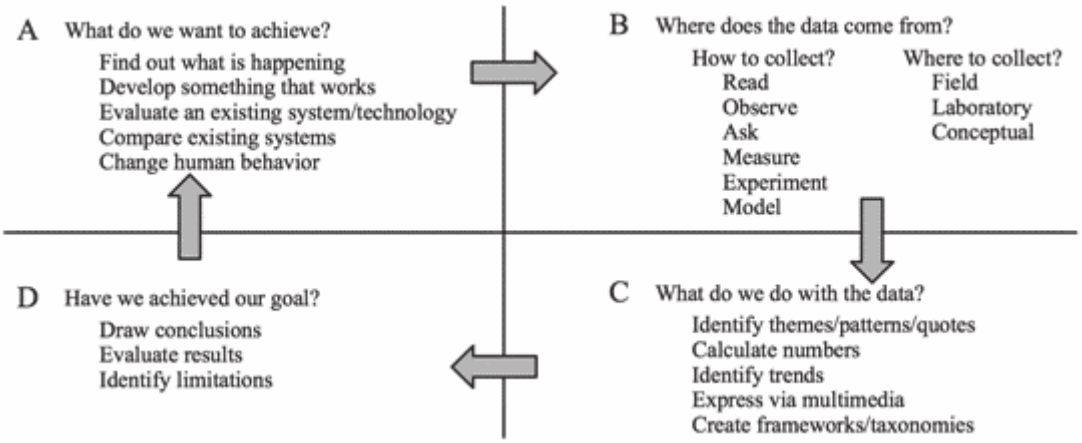

Figure 1

In the past, research techniques in computer science have been transmitted from mentor to student through apprenticeship. Relying solely on apprenticeship restricts the innovative research that students can perform. A community of practice (CoP) is a collection of people who get together to accomplish both individual and group objectives and who have a similar concern, set of issues, or interest in a subject. In the article of Holz et al., it is argued that joining a CoP is essential for knowledge acquisition. They also present a framework that consists of

four questions that guide the process of computing research cyclically. Figure 1 shows these steps.[4]

Every science has it's own research methods. If we come to computing science, firstly we need to keep in mind that it is a new field compared to other main fields. Innovations are being discovered day by day, so our duty is to follow them. In order not to get lost in this flood of information, as soon as we choose the topic for our research we should identify the best research methodologies.

Works Cited

[1] Dodig-Crnkovic, Scientific methods in Computer Science

[2] Glass et al. (2004). An analysis of research in computing disciplines

[3] Hassani (2017), Research Methods in Computer Science: The challenges and issues

[4] Holtz et a. (2009), Research Methods in Computing: What are they, and how should we teach them?