Computer Science Research Areas

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Abstract

Our main areas of interest within Computer Science are machine learning, computer graphics, and computer music.

Keywords: genetic algorithms, algorithmic composition

1 Introduction

1.1 What is research

Research tries to add something new to the body of knowledge in a particular field and seeks to find answers to a problem. This involves a systematic and intensive study in which the primary aim is a fuller knowledge or understanding of the subject under study.

This text is inserted to demonstrate how to start a new paragraph.

1.2 Why is research done?

Two basic purposes of research are to learn something and/or to gather evidence. Research also advances existing knowledge in a discipline, subject area or field. It fills significant gaps in such knowledge and is used to devise new modes or means of expression.

New perspectives in sciences, arts and humanities can be developed.

2 Background

Types of research include:

1. Applied Research

   - Research which studies the relationship and/or applicability of theories or principles to the solution of a problem for the purpose of producing results that may be applied to real world situations.
   - Research used to answer a specific question, determine why something failed or succeeded, and solve a specific, pragmatic problem.

2. Operations Research and Modeling

   - Application of mathematical models to study or plan a process designed to determine the most efficient way to do something. Often used to analyze complex real-world situations.

3. Primary (or original) research and Modeling:

   - Original research in which new data is actually collected from the natural world (via experiments, naturalistic observation, case studies, etc.) conducted to answer a research problem. Secondary research draws information from books, publications, or expert opinion.
   - Primary research requires: 1. knowing what has already been discovered on a subject (background) and 2. formulating a method to find out what you want to know.

4. Qualitative research

   - Concerned with understanding the processes which underlie various behavioural patterns through loosely structured, mainly verbal data rather than measurements. Analysis is interpretive, subjective, impressionistic and diagnostic.
   - An exploratory study, to explore an unknown sector, identify the main dimensions of a problem, draw assumptions, understand motivations. Or an operational study based on in-depth analysis of interviewee responses.

5. Quantitative research

   - Examines phenomenon through the numerical, projectable representations of observations and uses statistics to analyze results in an attempt to establish general laws and principles.

   - The numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect. Used in a wide variety of natural and social sciences, including physics.

6. Research and development

   - Aimed at discovering new knowledge in hopes that such activity will be useful in developing or creating research findings into new and improved prototypes, processes or services.

7. Secondary research

   - Finding out what others have discovered through original research and trying to reconcile conflicting vewpoints or conclusions, find new relationships between normally non-related research, and arrive at your own conclusion based on others' work.

8. Opensource development; Open Learning and research labs MIT

3   Machine Learning

The Biological Language Modeling project is based on the assumption that protein sequences from different organisms may be viewed as texts written in different languages.[1]

This is interesting to me because ... (or I find interesting ...) I have read about...

A possible project may be to try to...

4   Computer Music

McBlare is a robot bagpipe player.

This is interesting to me because...

A possible project may be to...

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