

# Problem Structure and Objectives in Computing Research

In research methods of computing, the concepts of problem structure and objectives are crucial for designing, conducting, and evaluating research effectively. They provide a foundation for identifying what issue the research addresses, why it is significant, and what the study aims to achieve.

## 1. Problem Structure

Problem structure refers to how a research problem is formulated, defined, and organized. It involves understanding what the problem is, why it matters, and how it can be approached systematically. Key elements of problem structure in computing research include: **Problem Identification:** Recognizing an issue, gap, or inefficiency in computing systems, methods, or applications. **Problem Definition:** Stating the problem clearly and precisely in research terms. **Problem Context:** Explaining the background, environment, or domain where the problem exists. **Problem Decomposition:** Breaking the larger research problem into manageable sub-problems. **Research Questions / Hypotheses:** Formulating testable questions or hypotheses based on the problem.

## 2. Objectives

Objectives describe what the research seeks to achieve. They provide direction and measurable outcomes for addressing the research problem. Good objectives are SMART (Specific, Measurable, Achievable, Relevant, Time-bound). Types of objectives: **General Objective:** The broad, overall purpose of the research (e.g., "To develop a secure authentication method for IoT devices"). **Specific Objectives:** Concrete steps that guide the research (e.g., "To design a lightweight hashing algorithm" or "To evaluate its performance"). **Operational/Practical Objectives:** Real-world impacts or contributions expected from the study (e.g., "To reduce energy consumption by 20% in IoT devices").

## Conclusion:

Problem structure ensures the research problem is well-defined and broken down into manageable parts, while objectives provide clear targets for what the research aims to achieve. Together, they form the foundation of rigorous and impactful computing research.