

## Reading Summary (example)

Theory of Science,  
Gordana Dodig-Crnovic (section 1)

The section provides a number of quotations from other authors attempting to define or characterize “science.” A common theme in the definitions and characterizations is the idea that science is a commitment to understanding reality as it is, and not as the investigator might want it to be.

Wikipedia: Science  
Viewed 8 Sept 2009

The article outlines what could be called the “main branches” of science, distinguishing between natural science and social science. Another distinction made in the article is between empirical and applied science. The article also suggests a category called “formal science” which includes mathematics, statistics, and logic.

The article traces the origin of the word “science,” as well as its practice. Starting from the Latin word for “knowledge,” the meaning of the word has changed to emphasize the goal-directed pursuit of knowledge and its organization. The modern meaning of the word draws connotations of rigorous, complex knowledge gained empirically by people in lab-coats.

There is a subsection of the article purporting to be about the scientific method, but the quality of this part of the wikipedia article is very low, so I stopped reading.

Computer Science: The Discipline,  
Peter Denning

Denning’s article attempts to characterize and describe the field of computer science by explaining its foundations, its relationship to other sciences, and by enumerating many contemporary subfields within computer science.

According to Denning, the foundation of computer science is the processing of information, with emphasis on digital computers. Denning characterizes the study with the question “What can be (efficiently) automated?”

One of the key aspects of the field is the “universality” of digital computational devices. Because computers can process all kinds of information, and perform all kinds of processing, using these devices requires specialized training to use effectively. Denning identifies a number essential skills for practitioners: algorithmic thinking, representation, programming, and design.

Denning's paper suggests that Computer Science can be broadly interpreted as having two approaches: applications and systems, though he admits the division is not "clean." The term applications does not refer to software programs, but to the directed use of computers to solve problems, i.e., to apply computers to solve a problem. The systems approach includes the study of how to use computers effectively (as opposed to how to write operating systems, for example).

Denning outlines some of the relationships between computer science and other sciences. The obvious connections to mathematics and electrical engineering are drawn, but Denning also shows applications to diverse areas such as biology and oceanography. The applicability of computation to any field with sufficiently formalized theories suggests that computing may have its biggest impact in applications, rather than systems.

Finally, Denning outlines a number of contemporary subfields of computer science, and describes the main areas of study of each.

### Is Computer Science Science? Peter Denning

In this article, Denning tackles the question posed in the title by means of a contrived conversation between himself and a somewhat skeptical third party. The main idea behind the article is that computer science can be broadly seen as a form of engineering, where applications are designed to solve specific problems. The article tries to motivate the idea that computer science is deeper than applications.

The main point that Denning makes is that computer science fits the category of science because its practitioners engage in their work scientifically. Primary scientific endeavours in computer science include answering fundamental questions about what can and cannot be computed, finding relationships and representations that facilitate efficient computation, and systematizing algorithmic processes into hierarchical organizations based on efficiency.

Denning suggests that not everything that computer scientists do is science, but that does not negate the principle. Denning also suggests that computer scientists are not unanimous in regarding their field as science. Finally, Denning suggests that computer science is guilty of not being as rigorous about its pursuits as other sciences.