

COMPUTER HISTORY

Group Topic Expressed In A Few Words

Group Number

Group Member 1

Group Member 2

Group Member 3

ABSTRACT

This document is a basic template for writing conference-style reports in LaTeX. You will use this template when writing your report; you will need to replace all text (excluding section headers or preamble information) with the content of your report.

1. INTRODUCTION

In a modern world of complex operation modes like asynchronous and functional programming, It is important to appreciate the simple methodology of real-time programming. It's a concept that emerged alongside what we consider modern computing and is still present in some form in nearly every computing application today. Everything from anti-lock brake controls, to space flight, to nuclear powerplant control units; everything uses real-time programming. The idea is simple: every input produces a near-instant output, and tasks are scheduled and run at exact times. Any delay, even a few milliseconds can be considered as a failure, and thus while it is a simple concept on paper, it is far more difficult to achieve in practice. This struggle and development is ongoing and continues to produce new solutions, both hardware and software, every year.

2. TIME PERIOD

You should describe the time period in which your topic was invented or used here. Also include the context for why your topic was created or for how it is used. Any specific historical information should be included here.

3. COMPUTER HARDWARE

The hardware in real-time computing must be extremely dependable and precise. This is critical because

any delay may cause the entire system to fail. Real-time Computing is used in many real life situations, from car breaks to launching missiles. A couple examples of the hardware in real-time computing is Xilinx FPGA and SoC boards, System-on-Modules, and Alveo Data Center accelerator cards. Another way to create more powerful hardware is by adding a real-time micro kernel between the normal hardware and the Linux kernel.

4. COMPUTER SOFTWARE

The main piece of software on a real-time computer is a real-time operating system (RTOS). An RTOS is an operating system that processes data as it comes into the system with little to no delay. The RTOS has a very limited amount of time (usually measured in tenths of a second) to process the data and if it can't process the data in time, the entire system will fail. While this seems useless, it actually is very important. Real time operating systems can be found in computer systems for cars and spacecraft for NASA, where performance is key. For example, the computer system controlling the self driving function in a Tesla needs to process data in near real-time in order to prevent a crash.

5. CONCLUSION

Conclude your research paper with any reflections on what you learned about your topic. Was this what you expected to find? Did you find any facts that surprised you? You may add other personal reflections about the topic here.

REFERENCES

Below are basic formats for different types of references.

[1] "What Is Real-Time Computing?" RTXI,

<http://rtxi.org/docs/tutorials/2014/12/06/what-is-real-time-computing/>.

- [2] “Real-time Operating System.” Wikipedia, Wikimedia Foundation, 26 Sept. 2019, en.wikipedia.org/wiki/Real-time_operating_system.
- [3] “What Are the Five Most Commonly Used Real-Time Operating Systems?” Stack Overflow, stackoverflow.com/questions/5281848/what-are-the-five-most-commonly-used-real-time-operating-systems.