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This research is to present the process-oriented simulation for studying computer system behaviour. This can help computer designers to evaluate and analyze processor performance. Because bebaviours of computer systems are difficult to specify as mathemetical models, developing simulation models using process-oriented simulation approach is convenient and useful for observing program behaviour on novel computer architectures. In this research a process-oriented simulator was built to simulate quasi-parallel systems in which many processes existed and evolved independently.

A processor model similar to the architecture of Intel microprocessor 8086 was developed for simulation. Benchmark programs were used to test the model. It was found that instructions with simple addressing modes were often used. Many architectural features were also studied to see their effects to the overall performance. This included the instruction queue and cache memory. It was found that processor performance was improved significantly with these features.