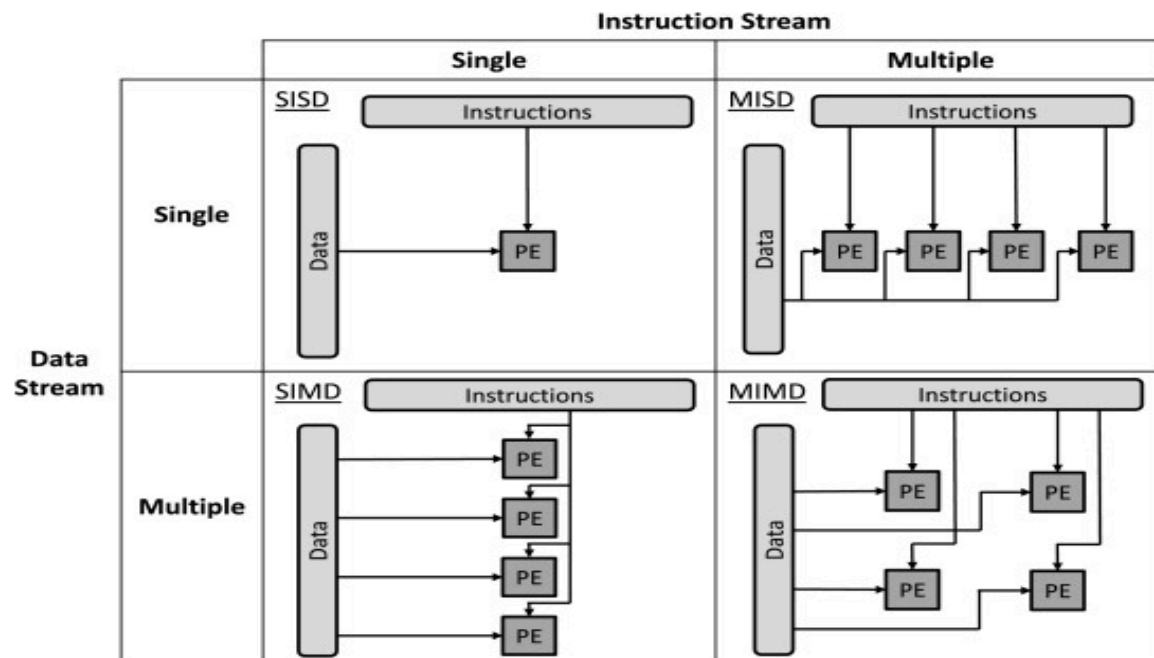


Flynn's Taxonomy

Flynn's Taxonomy, proposed by **Michael J.**



Flynn in 1966, is a classification system for computer architectures based on the number of instruction streams and data streams processed simultaneously. It divides computer architectures into four categories:

1. **SISD (Single Instruction, Single Data)**

- A **single processor** executes **one instruction** at a time on **one data stream**.
- Example: Traditional **Von Neumann architecture**, old single-core processors.

2. **SIMD (Single Instruction, Multiple Data)**

- A **single instruction** is applied to **multiple data streams** simultaneously, enabling **parallel processing**.
- Example: **Vector processors, GPUs, and multimedia processing (e.g., SSE, AVX instructions)**.

3. **MISD (Multiple Instruction, Single Data)**

- **Multiple processors** execute **different instructions** on the **same data stream**.

- Rarely used in practical systems but can be found in some fault-tolerant computing architectures.
- Example: **Some pipeline processors, spacecraft fault-tolerant systems.**

4. **MIMD (Multiple Instruction, Multiple Data)**

- **Multiple processors execute different instructions on different data streams, allowing true parallel computing.**
- Example: **Modern multicore CPUs, distributed computing, and supercomputers.**

Comparison Table

Type	Instruction Stream	Data Stream	Example
SISD	1	1	Traditional single-core processors
SIMD	1	Multiple	GPUs, Vector processors
MISD	Multiple	1	Fault-tolerant systems
MIMD	Multiple	Multiple	Multicore CPUs, Supercomputers

MIMD-based architectures dominate **modern computing**, including **cloud computing**, **parallel processing**, and **distributed systems**