7.2 General terms

Algorithm

A prescribed set of well-defined rules, processes, mathematical equations, or programmed sequence of instructions for the solution of a problem in a finite number of steps.

Analog

The representation of a smoothly changing physical variable by another physical variable. In data transmission, the term is used in contrast to digital. In this context, analog transmission uses amplifiers, required due to attenuation of the signal with distance, that magnify the incoming signal.

Analog Data

Data which represent a physical quantity that is considered to be continuously variable and whose magnitude is made directly proportional to the data or to a suitable function of the data.

Analytical Instrument

A device or combination of devices used to carry out an analytical process.

Archive

The storage of information for future use.

Artificial Intelligence

The capability of a machine to perform human-like intelligence functions such as learning, adapting, reasoning and self-correction. The main areas of application are currently in expert systems, computer vision, natural language processing, robotics, and speech synthesis and recognition.

ASCII

Abbreviation for American Standard Code for Information Interchange. It is an eight-bit (7 bits plus an optional parity bit) code for representing alphanumerics, punctuation, and certain special characters for control purposes.

Automate

To replace human manipulative effort and faculties in the performance of a given process by mechanical and instrumental devices which are regulated by feedback of information, so that the apparatus is self-monitoring or self-adjusting.

Automated Analytical System

A collection of analytical automation modules and modular analytical instruments configured to automate a complete analysis, from sample input to information output. The analytical system contains a user-interface to permit human interaction and may also have an archival module to provide the audit trail.

Automation

The use of combinations of mechanical and instrumental devices to replace, refine, extend, or supplement human effort and faculties in the performance of a given process, in which at least one major operation is controlled, without human intervention, by a feedback system.

Bar Code

An identification symbol in which the symbol value is encoded in a sequence of high-contrast bars and spaces. The relative widths of the bars and spaces contain the information. This machine-readable code, often on a label, is read (usually optically by a light pen or a laser scanner) into a decoder which transmits the encoded information to some external device for display, storage, or conditional processing.

Baud Rate

The measure of speed of signal transmission in data communications. The term baud refers to the number of times the line condition changes state per second. It can be measured in signal events (bits) per second.

Bit

Either of the digits 0 or 1 when used in the pure binary numeration system.

Branching

The function of a computer program that alters the logic path, depending on some detected condition or data status. For example, the program would branch to a reorder routine when the projected available went negative.

Bug

A mistake, omission or error in a computer program usually leading to unexpected or undesired actions or occurrences.

Bus

1. A facility for transferring data between several devices located between two end points, only one device being able to transmit at a given moment.

2. Conductor or group of conductors used to transmit signals or power. An information-coding method for signals on a common data channel.

Byte

A string that consists of eight bits.

Closed-Loop Control

Control achieved by feedback, i.e., by measuring the degree to which actual system response conforms to desired system response and utilizing the difference to drive the system into conformance. The measurement of the difference between what is achieved and what is asked for is used to increase accuracy and reliability.

Computer Interface

An interconnection which allows an electronic device to send data to or receive data from a computer.

Computer Network

A network of data processing nodes that are interconnected for the purpose of data communication.

Concurrent Processing

The simultaneous processing of more than one program.

Crash

A breakdown resulting from software or hardware malfunction.

Database

A comprehensive collection of interrelated information stored on some form of mass data storage device. Generally consists of information organized into a number of fixed-format record types with logical links between associated records.

Decomposition (in Robotics)

In control hierarchy, the breakdown of higher-level tasks into sets of procedurally simpler ones. These simpler tasks, in turn, become the goals of other tasks in a lower level of the control system. In the architecture of a control system that is hierarchically arranged, each level of the control system receives inputs and produces outputs that, in their turn, become inputs to another level of control.

Digital Control

Control involving digital logic devices that may or may not be complete digital computers.

Digital Data

Data represented by digits, perhaps with special characters and the space character.

Dynamic

A state in which an entity changes with time.

Echo Check

A method of checking the accuracy of transmission of data in which the received data are returned to the transmitter for comparison with the original data.

Error Control Procedures

Methods for detecting errors and recovering from those that occur in transmitting data. These methods include parity checking, checksums, cyclic-redundancy checks, frame-sequence numbering, and requests for re-transmission.

Feedback

The process whereby the output of a device is used to modify the operation of an analytical instrument.

Flow analysis

The generic name for all analytical methods that are based on the introduction and processing of test samples in flowing media. A primary classification can be based on two aspects:

(1) the way the test portion is introduced, i.e. continuously or intermittently/discretely, and

(2) the basic character of the flowing media, i.e. either segmented, unsegmented or monosegmented where segmentation is primarily considered as being applied for the purpose of preventing intermixing of successive analyte zones.

This leads to the following classification tree:

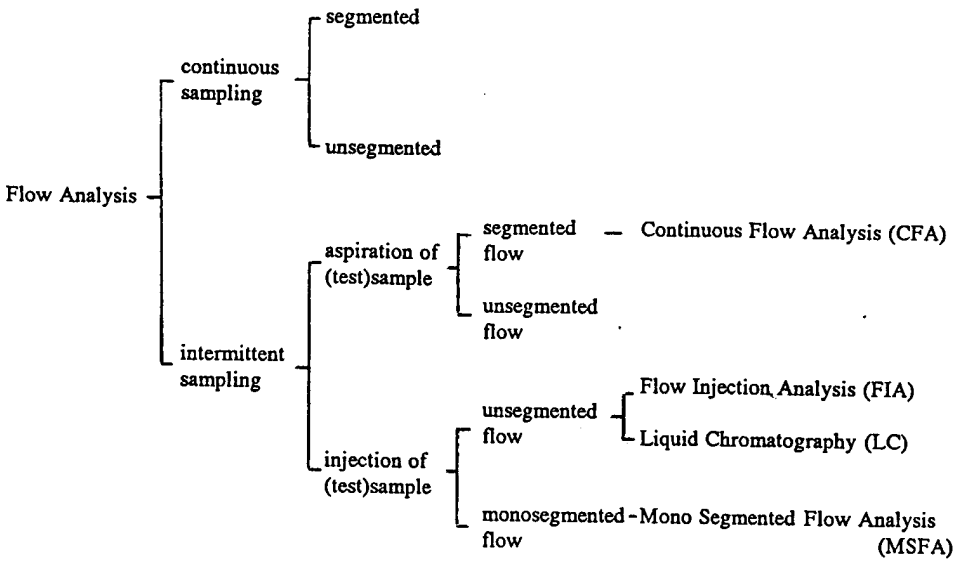

Fig.7.1 Classification scheme of flow methods of analysis

Hardware

The mechanical, electrical and electronic, pneumatic, or hydraulic devices that compose a computer, controller, robot, workstation, instrument, or peripheral device.

Heuristic Problem Solving

In computer logic, the ability to plan and direct actions to steer toward higher-level goals. This is in contrast to algorithmic problem solving.

Hierarchical Control

A distributed control technique in which the controlling processes are arranged in a hierarchy.

Hierarchy

A relationship of elements in a structure divided into levels, with those at higher levels having priority or precedence over those at lower levels.

High-Level Language

Programming language that generates machine codes from problem or function oriented statements. ALGOL, FORTRAN, PASCAL and BASIC are four commonly used high-level languages. A single

functional statement may translate into a series of instructions or subroutines in a machine language, in contrast to a low-level (assembly) language in which statements translate on a one-for-one basis.

Instrument

A device used for observing, measuring, or communicating the state of a quality and which replaces, refines, extends, or supplements human faculties.

I/O

Abbreviation for input/output.

LIMS

Laboratory Information Management System: a computerized system designed to provide on-line information about the samples analyzed in a laboratory. Information provided may include the current location of each sample in the laboratory, the method and status of each analysis, and experimental data and calculated results.

Local Area Network (LAN)

A communication system that connects a number of computers and their peripherals together to allow information sharing.

Machine

This term is not recommended. See *Analytical Instrument* and *Instrument*.

Manual

Refers to physical human intervention in an analytical procedure.

Mechanisation

The use of devices to replace, refine, extend or supplement human effort.

Note: The corresponding verb is mechanise.

Mechanism

A combination of parts, of which at least one is movable, capable of producing an effect.

Network

An arrangement of nodes and interconnecting branches.

Network Architecture

The logical structure and the operating principles of a computer network.

Program

A set of instructions enabling a device to perform an action.

Note: The corresponding term for provide a set of instructions is the verb: to program.

Product Data Representation and Exchange

Standard form for the unambiguous representation and exchange of computer-interpretable product information throughout the life a product, independent of any particular computer system. The nature of the description makes it suitable for neutral file exchange, a basis for implementing and sharing product databases, and archiving. The standard is comprised of several parts: description methods, integrated resources, application protocols, abstract test suites, implementation methods, and conformance testing. Also referred to as STEP.

Redundancy

Replication of information or devices in order to improve reliability.

Report

A combination of specimen information and results.

Note: The report should contain information about unequivocal identification of the source and type of material analyzed and the requesting agency. It may contain such other information that is pertinent to the correct interpretation of a result. See Chapter 2.

System

Equipment that as a group forms a whole. A group of devices that form a network for a common purpose or for a common distribution method. Four attributes are associated with a system: the number of units that make up the whole, the relationship among the units, the objective or goal of the system, and its adaptability to the environment.

Systems Engineering

The technique of optimizing the design, installation, and execution of large-scale systems. Makes use of scientific laws and empirical rules.

Transducer

A transducer converts input energy in one form to output energy of another. The transducer is a component