

Complexity Classes

The word «complexity» has so many interpretations that a classification is justifiable.

The members of each class have a similar meaning and interpretation.

The suggested classes are:

A) Formal Criteria

Some attributes or proprieties of the program can be used to classify its complexity as for example :

Logarithmic execution time .

Logarithmic memory capacity needed .

Computational capacity grows exponentially with time.

Computational capacity grows exponentially with capacity.

The problem is a P or a NP .

A complex problem is not solvable with a virtual Turing machine.

B) Informatics

The development of models with continues and discrete variables and powerful heuristics enabled the formal description of very complex real systems.

Powerful computers permit the evolution of the system and correct real time alteration.

C) Intricacy

This word is interpreted by the Oxford Dictionary as: perplexing, entangled, involved, obscure.

In Portuguese, «Intrincado» is the correct translation and «Trinco» means the object that causes the intricacy.

In Latin «trinco» is formally translated by «Clastrum?» meaning closure.

The word «tricky» is an adjoined interpretation of intricacy, because intricate problems were used in fowl play and exploitation of unprepared players.

In Portuguese «Trico» and «Trinco» have a very similar consonance and «trico» means «trapaceiro», «embusteiro».

Real world examples for «trincos» are many, the key that opens the door, the pin that enables access to the bank account. .

Creating methods to protect information and invent programs that permit the access of information considered protected, are millenary occupations.

The principal characteristic of intricacy is that you know where the problem is

D) Robotics

A robot is a copy, emulation, simulation, model of a living or not living being.

The progress has been enormous in all complex operations, industry, mining, agriculture «latus senso», and what can be referred as «humanoids».

Robotics has been a source of new formal models that can be used in other classes of complex problems.

The new frontier for robotics is to include the simulation of human emotions and the use of living being organs in the fabrication of robotic artefacts.

E) Translation and Truth Value

Information, «Forma», is transported by various carriers and each carrier uses its *carrier language*.

The transfer of «Forma» to the next carrier implies the translation of the former carrier to the next carrier and this may imply eventually the corruption of «forma».

The «forma» of the initial observer may also not be a perfect image of the real object that is been observed.

To mitigate the first observer model, usually many observations are executed using various observers.

E1) Truth Value, Tvl,

The concept of the «truth value», Tvl, was introduced as a real number member of the set $[0, 1]$ of real numbers.

Some rules to operate Tvl have been imposed, namely, additive and multiplicative connectives and interpretation of the conclusion.

Kings, generals, admirals, managers use staffs to evaluate the truth value of the enemy and of them selves.

With satellites and super computers this is now for specialised agents and complex models.

E2) Translation

The 1-1 translation is the referential translation model.

Let L_a and L_b be to languages and the pair (T_{ab}, T_{ba}) the translation functions and $\{F_a, F_b\}$ the «forma» to be translated.

A 1-1 translation has the following property: $T_{ab}(F_a) = F_b$ and $T_{ba}(F_b) = F_a$.

Languages translation are rarely 1-1.

F) Heuristic Language

The heuristic language of a formal language has the function to verify if the raw data is compatible with the formal data.

In broader sense the heuristic language can be given other functions.

Interpret the raw data and describe the information in a language compatible with the formal language.

This operation may produce a much better image then the raw data image.

A good specialist in heuristics is a very difficult job.

G) Action and Ethics

All living beings fight for food, shelter, dominance, territory and creeds.

In all fights there are a few winners and many losers and much breaching of rules and incredible interpretations of ethics, moral and religious dogmas.

All strategies, management, commands usually imply the recourse to some deceiving actions and only some are ethical acceptable.

Deceiving the opponent is, in principle, an authorized procedure provided no rules are broken if the fight or play is provided with rules and an arbiter is appointed to impose the rules and punishments.

Ethic and moral are a person belief and creed and in any set of persons there are no pair of persons with exactly the same ethics and no personal ethics can be applied world wide.

Of course a *set of rules* could be imposed universally with the approval of some and the opposition of many.

~~the approved set of rules~~ would permit the distinction between legitimate
actions that could be executed and the punishment of the non legitimate ones.

Force would be unavoidable to impose the approved *set of rules*.

A *set of rules* would be universally accepted if empty.

Imagination unlimited.

Every body is entitled to imagine and propose a certain number of axioms and try to prove the more important theorems, eventually one day in the far future it will be considered a very useful model.

Mater attracts mater, gravity force, but now «brown mater» repulses «brown mater», negative gravity..

If 2 copies of the same information are simultaneously embedded in 2 different carriers, for instance, light and sound, using different trajectories , the carriers would reach the goal at different times and it is conceivable that in some cases sound carrier would be the winner ! Why ?

Any one is entitled to conceive a new game for instance. e.g: this game abides very unorthodox rules, namely the rules are applied only when a majority of players vote in favour and that can happen even if the game is running. Cheating is an accepted procedure with a penalty.

Two moguls fight for victory over a chess game and *believe* that chess is a true model of a real war between two moguls is an extreme example of believing in models.

All these models look foolish and contrary to the conventional axioms and scientific beliefs but progress is a permanent correction of passed beliefs.