The Informational Foundation of the Human Act

1 §. *Introduction*

The 20th Century is the starting point for the most ambitious attempts to extrapolate human life into artificial systems. Norbert Wiener's Cybernetics, Claude Shannon's Information Theory, John von Neumann's Cellular Automata, Universal Constructor to the Turing Test, Artificial Intelligence to Maturana and Varela's Autopoietic Organization, all shared the goal of understanding in what sense humans resemble a machine. This scientific and technological movement has embraced all disciplines without exceptions, not only mathematics and physics but also biology, sociology, psychology, economics etc. New terms were developed, such as "information", "organization", "entropy", "communication", "encryption", "computation" and "algorithmics" to mention a few, all which had an enormous impact on artificial systems. Our work follows this historical track but with a reversed order of priorities. Instead of deducing a reduced group of human acts into an artificial environment, we deduce the human aspects of machines by extrapolating algorithmic methodologies into everyday life acts. The present informational theories were insufficiently powered to achieve this objective without developing a new theoretical approach. Hence, our research is directed towards an expansion of the current informational theories. [1]

2 §. *Understanding human acts*

Our work began by studying the differences between algorithmized acts and human acts. [1] To manage this comparison, we classified "series of human acts" according to the dependence of each act in respect to its predecessor. [2] As a result, we divided the human acts into three categories: 1) "vital acts", consisting of elements that are absolutely free (∞-levels of freedom) in respect to the predecessors; 2) "ludic acts", which are n-free; and 3) "mechanical acts", that are unfree acts (0-levels of freedom). The more *order* present in a series of acts, the less levels of freedom exist in each act. In other words, when the *organizational value* in a chain of acts increases, the levels of freedom decrease proportionally. Casual relationships are 0-free and have the highest organizational value. Human acts are mainly ludic with an organizational value ranging between 0-free and ∞-free. However, it has previously not been possible to differentiate

---

[1] Flores Morador, F & de Marcos Ortega, L. The Informational Foundation of the Human Act. (2018) https://www.amazon.com/informational-foundation-Fernando-Marcos-Morador/dp/8416978611

[2] This was inspired by von Misses and Karl Popper´s probability theory. Popper, Karl R. *The logic of scientific discovery*. Hutchinson; London, 1980; p. 159.

between different kinds of ludic acts because no instrument has allowed us to measure (or quantify) human acts. Therefore, we first had to develop a measurement theory that was able to quantify human acts. The new measurement unit for organizational value is compatible with the bit, the basic unit of information in computing and digital information.

3 §. *Essential difference between the ludic act and the mechanical act*

What we today identify as "artificial reasoning" or "computation" is the *algorithmization* of a series of "human mental acts". The human acts that can be algorithmized are those that can be organized in diagrams of flux, where different acts can be extrapolated as *imperatives,* such as to write or to read. These imperatives extrapolate the acts of writing and reading as *independent* acts that polarize to the future, when the reality of it is that they are complementary acts that cannot exist independently. The act of writing is polarized to the future and the act of reading is polarized to the past. [3] Consequently, the first step of our research has been to understand this concept of the polarization of human acts in artificial systems. We believe that a machine acts autonomously, while human beings act interactively and generate a rhythm of patterns within the specific administrated time that is given.

4 §. *Development of a measurement theory*

Because *measuring* is a human act, developing a measurement theory subsequently implies that we are developing a theory of human acts in general.[2] For example, the act of writing causes a written text, however, neither the act of writing nor the written text itself is the cause of the act of reading that text. The relationship between the act of writing and the act of reading is not *causal*, therefore it cannot be *mechanical*. The relationship cannot be *vital* either because then we would not be able to distinguish patterns in the text. Hence, it must be *ludic*, which means that some levels of freedom exist. The relations between a series of human chain acts must be actively connected in a type of "freedom-in-control relationship", that we specifically denote as *polarization – the temporal structure of human acts.* The complementary chain of acts that exist in writing (polarized to the future) and reading (polarized to the past), follow the rules of the signs of multiplication. This particularity makes an algorithmization of polarizations feasible, because every written text would be polarized towards a future reading and every reading of a text would be polarized towards an act of writing that occurred in the past. Hence, it is impossible to keep secrets, because

[2] Flores Morador, F & de Marcos Ortega, L & Flores Bjurström, C. Hermeneutics of measurement. (2021) https://www.researchgate.net/publication/350021970_Hermeneutics_of_measurement

if a written text has not yet been read, the act of reading will find and similar as a magnet, polarize towards its past. Furthermore, it is important to distinguish the concept of polarization from the concept of causality; polarization is not present in today's algorithms, because they are based on 0-free acts and cannot extrapolate n-free acts.

5 §. *Complementary and parallel ludic acts*

Complementary acts that polarize to the past [-] and to the future [+] follow the rules of multiplication and therefore *have no present,* since the final sign will be negative, meaning a polarization to the past. *Parallel* acts on the other hand, follow the rules of the signs of addition and subtraction, therefore, the final sign of parallel acts are able to polarize to *the present* [0]. *Parallel acts* differ from *complementary* acts by not sharing the same referent object. Each parallel act presents their own object, for instance, [John brings Mary a bouquet of flowers] and [Mary is grateful and sends a book to John] are two parallel acts. The first act is polarized towards the future [+], while the second act is polarized towards the past [-]. However, these polarizations *approach* the *present* because John and Mary need to meet in a time-space coordinate system, to exchange presents. John and Mary *negotiate* the meeting by excess or by default, until they reach the present (symbolized as zero, [0]). If the act polarized to the past prevails, we have an approximation to the present by default. Instead, if the polarization to the future prevails, we have an approximation to the present by excess. In parallel acts, the objects must be operationally compatible with each other. For example, we cannot empty a lake with a cube because the lake and the cube are not operationally compatible. Going back to the first example, the flowers and the book are operationally compatible objects and therefore, the polarization towards the present is possible. When the objects are operationally compatible, we say that the acts become polarized towards the present in an *absolute* way.

Defining a general act of measurement

The *act of measurement* falls under the category of *parallel* acts, and should be understood as a minute *comparison of the same variable present in two different items or substances*. For example, comparing the temperature of the mercury inside the thermometer with the temperature of the air surrounding it; or measuring the length of an object with a ruler. Note that the measurement process should not be confused with the act of doing an experiment, which is a *comparison of two states of the same item or substance* and falls under the category of *complementary* acts. For example, in a medical experiment, the effect of a drug is studied by comparing the effect of the drug in a group of cases versus a control group. It is important

to remember that the *results* of an experiment are not based on the act of measurement. In this context, the measurement methodology must start with a classification made upon the polarization of different acts. It is obvious that the measurement of complementary acts cannot be done because there is no polarization to the present. Therefore, if we want to measure complementary acts, they must first be converted into parallel acts.

6 §. *Strong and weak embodiment: "shouts" and "whispers"*

We distinguish between two levels of embodiment, "strong and weak" where a *strong embodiment* implies the capability of touching objects of the world and *weak embodiment* (or embodiment of the eye or mind) implies objects of the world as we see or think of them. A strong embodiment provides the observer with a space-time coordinate system of reference, which is what characterizes parallel acts. Thus, we conclude that the act of measuring strong embodied objects falls under the category of parallel acts. Weak embodiment include the *act of seeing* and the *act of the mind*, which require us to delimit the frontiers between *seeing* and *mentalizing*. "To see" is an act of the senses (directly related to the human body), in contrast to mentalizing, which is not an act of the senses. This delimitation can be done pragmatically by associating weak embodiment to the mediation of instruments that enable us to see or mentalize tiny and/or far away objects by enhancing our vision and mentalization. More generally speaking, objects that are incongruent with the size of the human body (artificial objects) need to be visualized or mentalized. A mentalized presentation is conceptual rather than visual, for example the graphic curve of a mathematical expression cannot be understood as visual because it is not an object of the senses. To understand a mathematical curve, it is necessary to disconnect the senses and connect the act of the mind. The act of measuring weak embodied objects falls under the category of complementary acts. For practical reasons, we denote measurement acts that involve embodiment in a strong sense as *"shouts"* and the acts that involve embodiment in a a weak sense as *"whispers"*. This means that *shouts* constitute parallel acts, while *whispers* constitutes complementary acts.

7 §. *The measurement of an organizational value*

Undertaking the task of developing a novel method of measurement, different measuring units for shouts and whispers were created. To be able to measure shouts, we created the *package-bit* (p-bit). Since shouts involve measuring objects that are proportional to the human body, we arbitrarily attributed a real number to each body part involved in the act of measurement . An act of measurement that engages the entire human body generates 16 package-bits, corresponding to one horse power (hp).

Measuring the organizational values of whispers however, is more challenging because whispers are complementary acts that cannot be ordered. By matching whispers with a set of complex numbers (that cannot be ordered either), we could follow the praxis of the calculation of the *modulus* of a complex number, and thereafter used an *Argand* diagram to make a conversion of complementary acts into parallel acts. In other words, by identifying the modulus of a complex number and matching it with organizational value unit, we were able to create a new unit that can measure whispers, denoted as *hermeneutical-bit* (psi-bit, which is an irrational number). Following this step, we constructed an *"artificial hermeneutical circle"*, a database that consists of 1000 whispers, divided into 16 "niches", to which we associate 16 organizational values expressed as psi-bits. This database is operated by simple arithmetic operations and for each spin of the *hermeneutical wheel*, we obtain a constant measure for each sample of whispers[3]. The traditional unit of information, the bit, is used as the measurement unit of *"media-shouts",* which include texts, pictures and sounds. Because bits are always integers and the p-bits are always real numbers, we say that the bit is convertible to a p-bit and vice versa by sacrificing/gaining the rest of organizational values. As a rule, we convert p-bits into ψ-bits multiplying the p-bits by 0, 25 and conversely, ψ-bits into p-bits multiplying the ψ-bits by 4.

8 §. *Conclusions*

Our research aim was to develop novel informational units (p-bits and ψ-bits) that enable us to measure all aspects of human acts, which was previously impossible. This new informational approach provides us with a better understanding of the differences between human acts that have an economical impact and human acts that have an organizational impact. As the whole world spins around the concept of order, we know have gained a deeper understanding of the time processing involved in different human acts. More specifically, we have created a database that can measure different human acts by extrapolating them into algorithms of the "doing".

[3] A book compiling our theory of measurement with examples, currently *in press*. Fernando Flores Mordaor & Luis de Marcos Ortega. *Whispers and Shouts. The Informational Measurement of the Human Act.* (2021). More information can be found at our website informationalact.com