

Analog Processing: An application in the Basics of Real Space and Wave Mechanics.

Prof. Shia Chau Sen, Shia, Khaohun,
 Post-Production Engineering Doctor
 Master of Electrical Eng.
 Corresponding Author: Prof. Shia Chau Sen

Summary: Matter consists of mass, energy, and frequency. Your physical and behavioral identification can be performed by processing your frequency. Analog and frequency processing leads to the construction of a new computational technology similar to biological and natural functioning

The identification and storage of information can be performed by the execution, identification, recognition and storage mechanism of frequencies. The proposal of this work presents a new form of information processing performed by frequencies and wavelength that can be the basis for the computational analog processing. The fundamentals of this application are based on theories of relativity, wave frequencies and principles of quantum mechanics and quantum physics.

The construction of a machine by frequencies allows to give this machine feelings and capacities of vector calculations during the execution of its processes, besides the identification of the entities of its environment. It allows the identification of your objects through sensations and sensitivities.

Keywords: Frequency processing, Computational analog processing, Vector calculations, Sensations and sensitivities, quantum mechanics and physics.

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I. Introduction

Computational process can be performed in digital or analog. The digital form has occupied its space for many years and has shown that it is possible to live in a world where reality is analog. Its adaptation is done applying several conversions so that it is possible to approach it within the virtual reality. The purpose of this work is to present the application of analogue processing through the use of wavelengths, frequencies and periods, as well as analogue computation, analog signals, propagation media.

This compares the operation of a digital computation with an analog processing. Their results are presented through tables and graphs after the tests and analyzes performed. For future work, it is proposed to demonstrate the creation of other types of applications using analogical computing and fundamentals that enable the development of an analog computer.

II. Period and Frequency

A periodic phenomenon happens when it is able to repeat at equal intervals of time, it is the shortest time interval for repetition to occur. Already the frequency is the number of times of this occurrence in a unit of time and can be defined as: $f = 1 / T$.

Engine (rps)	Freq (Hz)	T (s)	Freq (Mhz)		Freq (Hz)	Engine (rps)
1	0,016667	60	1,66667E-05		0,01666667	1
2	0,033333	30	3,33333E-05		0,03333333	2
3	0,05	20	0,00005		0,05	3
4	0,066667	15	6,66667E-05		0,06666667	4
5	0,083333	12	8,33333E-05		0,08333333	5
6	0,1	10	0,0001		0,1	6
7	0,116667	8,571429	0,000116667		0,11666667	7
8	0,133333	7,5	0,000133333		0,13333333	8
9	0,15	6,666667	0,00015		0,15	9
10	0,166667	6	0,000166667		0,16666667	10

Table-01 Ratio and frequency ratio of the analog processor.

Table-01 shows the values assigned to the rotation mechanism in relation to the values of their respective frequencies. By activating the number of the rotation of the mechanism, it generates its own frequency value, its period and the frequency in Mhz. Then the same frequency generates the corresponding

number in the output of the same number of rotation generated in its entrance, after the sum of the corresponding frequencies of each number recorded in the analog processing memory. The frequencies of each number entered are performed by the analog processor each frequency corresponding to the generated numbers is unique.

Engine (rps)	Freq (Hz)	T (s)	Freq (Mhz)	Engine (rps)
1	0,016666667	60	1,66667E-05	1
2	0,033333333	30	3,33333E-05	2
3	0,05	20	0,00005	3
4	0,066666667	15	6,66667E-05	4
10	0,166666667	125	0,000166667	10

Table-02 Result of calculation through the generated frequencies.

Figure-01 shows a digital waveform, used in machines that work with the digital architecture and its relation with analog signal. It is observed that the signals between the duration of times 1 and 2, there is the loss of signals during the digital pulses. Already at a frequency in the analog form the signals retain the captures of a real environment with its captured characteristics.

All materials have their identifications through their own frequencies and once these frequencies have been captured, their nature and characteristic are identified. In addition to its own frequencies each matter, has its energy, mass, wavelength and period of existence.

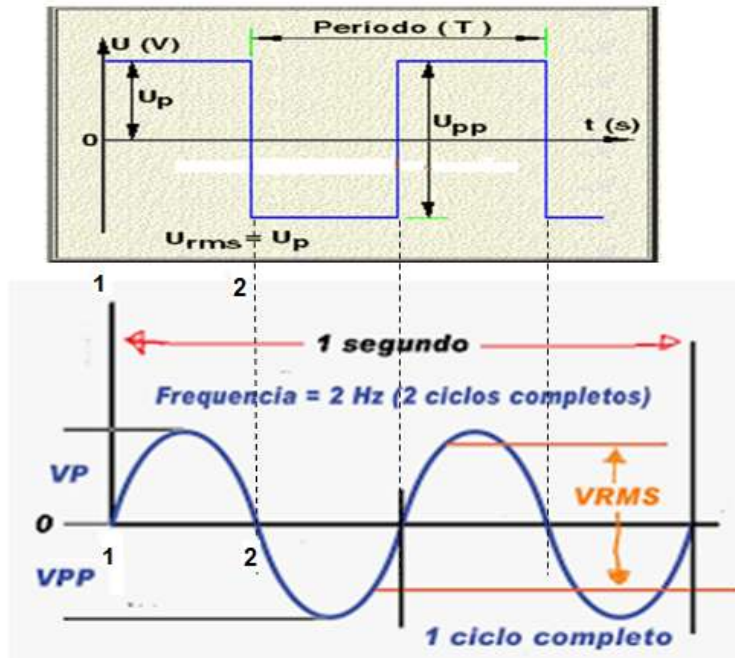


Figure-02 Analog electrical signal.

As the figures show an analog signal, it captures the signals naturally and keeps all properties recorded or transmitted. There is no loss of information and no conversion is required.

Analog Signals

An analog signal, other than a digital signal, is a continuous signal type as a function of time. It allows its values to vary by all values that are comprised between their integer values.

Analog computing

An analog computation allows you to process analog data, perform your calculations continuously, and in your runs do not use symbolic numbers in your rendering. Already in an analog computation the measurements of its results do not require conversions. In addition, an analog computation allows its executions to be simultaneous work with infinite numbers and in parallel form or multiple simultaneous tasks. Analog processing also lets you deal with continuous variables.

In an analog computer, the continuous variation of a variable is also continuous, this type of system allows to obtain solutions of the same problem and solutions of complex problems. Next we show the machine of construction of the frequencies for the musical notes and numbers.

The table below shows analog scores and musical note records using analog processing.

Freq (Hz)	T (s)	Engine (rps)	Notas Musicais
264	0,003788	15840	Dó
297	0,003367	17820	Ré
330	0,00303	19800	Mi
352	0,002841	21120	Fá
396	0,002525	23760	Sol
440	0,002273	26400	Lá
495	0,00202	29700	Sí
528	0,001894	31680	Do

Table-03 Analogical result of the frequencies of musical notes.

Table-04 shows the results obtained in the capture of musical notes through the frequencies and periods recorded in the capture of analogue and recorded signals.

Engine (rps)	Freq (Hz)	T (s)	Freq (Mhz)	Engine (rps)
15840	264	0,003787879	0,264	15840
17820	297	0,003367003	0,297	17820
19800	330	0,003030303	0,33	19800
21120	352	0,002840909	0,352	21120
23760	396	0,002525253	0,396	23760
26400	440	0,002272727	0,44	26400
29700	495	0,002020202	0,495	29700
31680	528	0,001893939	0,528	31680

Table-04 Analogous result of the capture of musical notes.

The table-05 below shows the records of the numbers by their frequencies and their captures by their meaning. The values are generated in Hz and the results of your calculations are also calculated in Hz.

Engine (rps)	Freq (Hz)	Information
1	0,016666667	One
2	0,033333333	Two
3	0,05	Three
4	0,066666667	Four
5	0,083333333	Five
6	0,1	Six
7	0,116666667	Seven
8	0,133333333	Eight
9	0,15	Nine
10	0,166666667	ten
11	0,183333333	Eleven
12	0,2	twelve
13	0,216666667	thirteen
14	0,233333333	fourteen
15	0,25	fifteen
16	0,266666667	sixteen
17	0,283333333	seventeen
18	0,3	eighteen
19	0,316666667	nineteen
20	0,333333333	twenty
21	0,35	twenty-one
22	0,366666667	twenty-two
23	0,383333333	twenty-three
24	0,4	twenty-four
25	0,416666667	twenty-five

Table-05 Result of the registration of the numbers by frequency.

Table 6 shows the results of the logarithms of 2 in base 3 and logarithm of 3 in base 10 in frequencies (Hz) and the sum of those frequencies of logarithms, with the results in Hz, with the analogous results. The computation of the calculations is performed in Hz as analogue computation and the results are checked according to the values in table-05.

Analog computing and the results are checked according to the values in table-05.

Value A	Value B	Result	Calculation	Results (Hz)	Results (Number)
1	2	0,05	Sum (1+2)	0,05	Three
2	3	0,08	Sum(2+3)	0,083333333	Five
1	2	0,05	Multiplication (1*2)	0,033333333	Two
2	3	0,10	Multiplication(2*3)	0,1	Six
2			log	0,301029996	
3			log	0,477121255	
2	3		log 2 +log 5	0,7781512504	

Table-06 Result of calculations of logarithms with the analog values recorded in Hz.

The examples in table-06, show when typing values 1 and 2, are generated the unique frequencies of this numbers and then the calculations are done by means of the quotient of their frequencies. When generating the results in frequencies, it is verified that they correspond to the frequency equivalent to number 3, then the corresponding value is presented at its output. The calculations are done through the values of their frequencies, without any conversion. This is also true for multiplication and logarithm calculations.

III. Quantum Mechanics.

Quantum mechanics is a theory, moreover, it is also a model, in which it helps in the interpretation of facts and nature, in the attempt to understand nature itself. The capture of the facts of nature through frequency has the possibility of obtaining the real form and meaning of its essence and properties. Often they are beyond the capacity of human observation and machines. One of the examples is in the relation of the gears of an automatic gearbox with respect to the movements and inclinations of the soils to the rotations necessary for the development of the motor force for the interpretation of its movements.

A photoelectric effect shows that the variation of light intensity at a certain frequency does not change the kinetic energy of each electron. The energy of the light is delivered in plots of photons and each of them according to their energy. One of the essential characteristics of quantum mechanics is based on dualism. As regards light, the main processes are: emission, transmission and absorption. The theory of photons describes the behavior of light, or wave theory, describes the process of light transmission. Light waves, however, are not observable. Regarding light, it is concluded that around the matter there is the electric field composed of several magnetic fields, known as speed of light and has a velocity of approximately 3,108 m/s.

The rotation about its axis produces a current, in which it generates its electric field and the existence of the magnetic fields in a point, besides defining for each matter its magnetic field or specific frequency of each element or lines of induction. Light does not exist, but the releases of energies from the induction lines of matter, in a certain region of space, in the direction of the north pole to the south pole, thus giving rise to the uniform magnetic field of the materials. In this way, the magnetic field generated is the currents around the materials that are responsible for the energies of these materials, since all matter has its own energy in the form of frequencies.

IV. Mechanical Engineering

It is considered that the transfer of an energy is related to the quanta (unit of energy) and that all matter has the aspect of a wave, when one considers the behavior of matter. Thus, when developing a theory for analog computation the fundamentals of frequency, period, and wavelength should be considered.

All transfer and transmission of energy must be based on the concept of light as waves or particles and the double aspect of matter. It is also known that quantum mechanics is restricted only to the possible facts to be observed. When it comes to unobservable facts the application of quantum mechanics, it does not allow to accurately predict its exact position in space, but it is possible to establish the probability of its occurrence.

It is also known that the transmission of an electron obeys the laws of wave motion, this description allows to calculate the probability of its position in space. What defines light as particle and wave is the magnetic field induced by the current or energy around the matter by the induction lines of all the lines oriented by its senses. In this way it produces the magnetic spectra of the frequencies, the physical phenomena of the quantum aspects of nature by the difference of phases, amplitude, wave length of the magnetic field or light.

V. Harmonic Motion and Wave Phenomenon

One of the simplest waveforms is simple harmonic motion, its force has the intensity proportional to its opposite direction distance from its equilibrium axis.

Sound is one of the wave phenomena that propagate in the air, liquids and solids. Sound is considered as a mechanical wave and needs a material medium for its propagation. A wave can be observed. A wavelength may be the distance between two consecutive points where diffraction and interference occur.

A refraction of sound occurs when this wave passes to another medium with different velocities, however its frequency does not change, it remains constant and modifies only the length of its wave. It is also known that the occurrence of a diffraction of the sound allows circumventing obstacles whose dimension does not exceed 20 meters of distance. Already interference occurs when the waves overlap.

An undulatory movement allows the transport of energy and momentum to another space, without the transport of matter and can be called a transverse wave.

VI. Electromagnetic Waves

A light is also an electromagnetic phenomenon and they have refraction and interference, however they do not need a material medium in their propagation, they can propagate in the vacuum. Electromagnetic waves are classified according to their wavelength and their frequency. For Plank, electromagnetic radiation is not continuous but rather quantized or individual packets in multiples of integers of $h\nu$ value (Plank constant), called quantum.

Therefore, light has the properties of wave and particle. A photon represents a quantum of light. Table 7 below shows a frequency application for values using scientific notations for the energy calculation of a photon whose frequency is 2×10^{-24} Hz and Plank constant of 6.626×10^{-34} J.s.

E=hv	h=Plank Constant	v=fóton frequency	E'=hv
1,3252000000E-09	6,626*10^-34	2*10^24 Hz	1,3252000000E-09

Table-07 Result of calculations Energy of a photon.

The table-07 shows the results of a frequency calculation for the energy (E) of a photon, already (E'), shows the duality of quantum mechanics and simultaneity of relativity theory in an analog frequency processing.

Wave Frequency

A wave frequency is related to the number of complete wavelengths of a given point in space for each second and defined by $c = \lambda f$, where (c) represents the velocity of light (3×10^8 m / s), (λ), wavelength in meters and (f) frequency in Hz. All matter has energy, frequency, mass and wavelength.

Table-08 shows the result of an application for calculating the wavelength of light of a given electromagnetic radiation with a certain frequency in Hz.

Table-08 Result of calculations of a length of an electromagnetic radiation.

c=light velocity (m/s)	λ= wave length (m)	v=electromagnetic radiatio of frequency (Hz)	c=λf
300000000	2,000000E-08	1,5E+16	m.Hz

Table-09 shows a simplified table of the values of the magnetic spectrum of the lights. The result is in analog processing where you can get the original properties of the actual colors during an analog computation.

Electromagnetic Spectrum	
	Hz
Ray (γ)	1,00E+24
	1,00E+22
	1,00E+20
Ray (X)	1,00E+18
UV	1,00E+16
Color	Meters (m)
Blue	0,0000004
Green	0,0000005
Red	0,0000007

Table-09 Electromagnetic Spectrum

Table 10 shows the results of an application for the capture, storage and transmission of electromagnetic waves in analog processing. The presented results describe the ability to obtain the real characteristics of the images without data conversion and allow the capture or transmission of natural behaviors, which can aid in analysis in several areas of application of science and studies of several levels, as shown in the figure -01.

Various levels of tonalities, sensitivities and colors that can represent the true situations of the behavior of a light, present the results according to the needs of use in a computerized application. It is known that the wave length for the green light may vary between 520 to 560 nm and the orange color between 590 to 635 nm. It is also known that there are several levels of colors as shown in Table 10 results, such as blue and green color variations, according to variations in wavelengths and frequencies in Hz. The Light is only a subset of the frequencies of the electromagnetic wave

f(Hz)	Results	λ (meter)	Results Colors
9,9000E+23	Ray (Y)	4,1E-07	Blue
1,00E+24	Ray (Y)	4,2E-07	Blue
9,90E+21	Ray (Y)	4,3E-07	Blue
9,90E+19	Ray (X)	4,4E-07	Blue
9,90E+17	UV	4,5E-07	Blue
		5E-07	Green
		5,1E-07	Green
		5,3E-07	Green

Table-10 Results presented in the application of an analogue processing of a magnetic spectrum

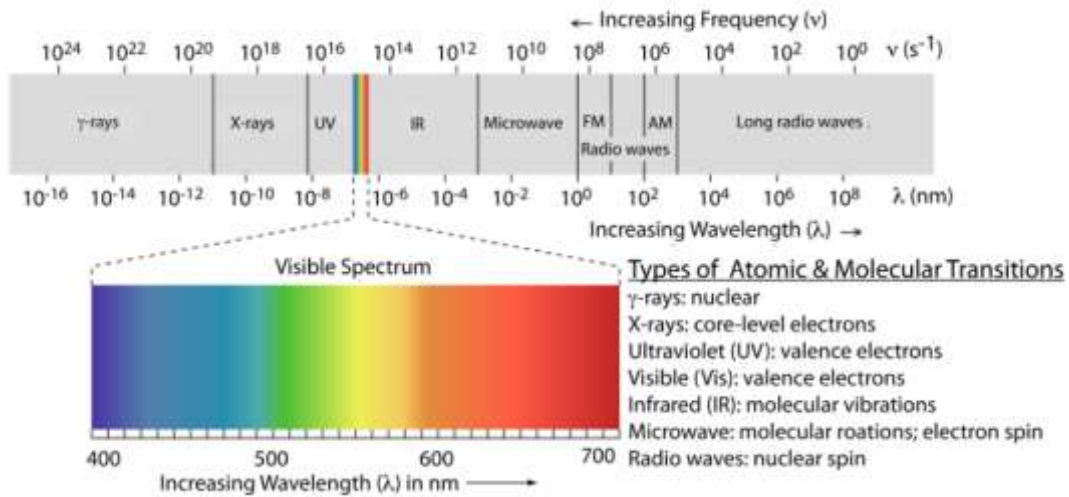


Figure-03 Electromagnetic Spectrum

Figure-03 shows the capacity of representation and application for an analog computation, in which several levels of colors and shades can be represented by calculations of frequencies in the representation of magnetic spectra.

The essence of matter lies in the definition of its energy, frequency, mass and speed of light. Analogical computing by frequency also allows the study and analysis of its atomic structure and behavior of its matter. Table 11 shows the results of applying energy and frequency calculations at the atomic structure level to define the matter and behavior of particles and electromagnetic waves of light.

Frequency calculation at atomic level

electron mass (Kg)	speed of light (c) ²	Energy (J)	h (J.s)	f=E/h (Hz)
9,1E-31	9E+16	8,19E-14	6,626E-34	1,23604E+20

mass of hydrogen (kg)	speed of light (c) ²	Energy (J)	h (J.s)	f=E/h (Hz)
0,001	9E+16	9E+13	6,626E-34	1,35829E+47

Table-11 Frequency calculation for atomic-level structure.

VII. Conclusion

Analog processing, through frequencies and wavelengths, allows simplifying computational computations in the analog form, as well as reducing memory utilization, also allows the capture and transmission of information with its real and natural properties. An analog computational machine through its frequencies can deliver analog results more accurately without converting its information and capturing its true essence. Calculations can be performed through their frequencies during the capture and execution of their results directly.

The results presented in this work, as shown in the tables, describe the possibilities of application and development of an analog computer by frequencies. The real and natural reproduction capacity of the material in its results justifies the implementation of an analogue frequency processor.

In spite of the results obtained, another point that could be considered for future work is the realization and demonstration of a structure and architecture for the construction of an analog processor by computer frequency. In this paper, an application for classification of medical analysis using a neuro-biostatistical network will also be presented.

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