Armstrong Harmonics or The Code of Socio-Economic Forecasting

By Dr. rer. nat. habil. Norbert Schwarzer

Abstract

Somehow my 15-year-old son, Felix, had heard about the story of Martin Armstrong, "The Forecaster", who was imprisoned for many years, because "THEY" wanted the source code of his socio-economic computer model, "Socrates".

Consequently, so one thinks, this code must be something very special and it should be extremely difficult to guess how it works.

Nevertheless, Felix was quite keen to find out how such code might look like and so – at some point – he resorted to the simple measure of asking his father, whether a "Quantum Gravity" approach would help to give the answer. After all, so his reasoning, there is also the other name for such a theory and this is "The Theory of Everything"… and it must be there for a reason.

Abstract References

[A] theforecaster-movie.com/

The Clue

Now, according to Mr. Armstong (and the facts supporting his version of the story), he was imprisoned for 11 years because "they" wanted his source code too badly.

11 years in prison… so this must be a very powerful and – so one thinks – extremely complicated piece of software!

On the other hand, Mr. Armstong actually is not very secretive about the fact that he uses pattern recognition technologies in order to extract frequencies of harmonics in socioeconomic processes, compares them with historic data and their internal frequencies and extracts his forecasts from extrapolations of these very oscillations, respectively these oscillation patterns.

A First and Rather Timid Conclusion

Interestingly, and here is why Felix came up with the idea that a Quantum Gravity approach (see appendix of this paper) might help us to give an answer in the first place, it is waves and oscillations which in a general space or space-time of properties make out the fundamental solutions and a society – even though very complex – is nothing else but a massively dimensional, highly entangled socioeconomic space-time (with not just one time-dimension, by the way). In order to find the frequencies of the harmonics determining the fundamental solutions one must run all data of the society, one can lay one's own bony hands on, through a multidimensional Fourier analysis and feed the finding into the socio-economic sound model (the music of the society).

What sounds quite simple, still is an immense task, because the collection and ordering of data alone is anything but straight forward. So, the first and hasty drawn conclusion could be that Armstong must have an highly efficient pattern recognition code, combined with multidimensional Fourier analysis. Taking the analogy with the "music of the society" from the paragraph above, this author is quite sure that the core of the code looks very familiar to people, who are working with software used in acoustics.

The Missing Piece

Could it be that simple?

Of course not!

The one thing even the best and powerful n-dimensional Fourier analysis and pattern recognition machine does not reveal is the metric of the socio-economic space-time being considered. The metric codes the internal symmetries, their intrinsic uncertainty and their evolution potential. Without this structural knowledge all the frequencies and patterns are – almost – useless.

So, Felix Has a Point

Summing it all up, we see that Felix' idea actually is a quite good one. The measured data, society parameters and their permanent changes (evolution) are the necessary ingredients for a proper digital twin of the real socio-economic space-time (potentially in the form of one part of Martin Armstrong's Socrates), but this is not enough. We also require an underlaying theoretical framework showing us the intrinsic geometry to which all the frequencies (waves, oscillations, phononic structures and general repetitive patterns) have to be allocated in order to end up with a useful forecasting machine.

Appendix: A Hilbert-Based Quantum Gravity Theory

We start with the following scaled metric tensor and force it into the Einstein-Hilbert action [1] variational problem as follows:

$$G_{\alpha\beta} = g_{\alpha\beta} \cdot F[f] \quad \rightarrow \quad \delta W = 0 = \delta \int_V d^n x \sqrt{-G} \cdot R^* \qquad (1)$$

Here G denotes the determinant of the metric tensor from (1) and R^* gives the corresponding Ricci scalar. Performing the variation with respect to the metric $G_{\alpha\beta}$ results in:

$$0 = \left(\begin{array}{l} \boxed{\boxed{R_{\alpha\beta} - R\frac{g_{\alpha\beta}}{2}}} + \frac{1}{4F^2}\left(F_{,\alpha} \cdot F_{,\beta}(3n-6) + g_{\alpha\beta}F_{,c}F_{,d}g^{cd}(4-n)\right) \\ -\frac{1}{2F}\left(\begin{array}{c} F_{,\alpha\beta}(n-2) + F_{,ab}g_{\alpha\beta}g^{ab} + F_{,a}g^{ab}\left(g_{\beta b,\alpha} - g_{\beta\alpha,b}\right) - \\ F_{,\alpha}g^{ab}g_{\beta b,a} - F_{,\beta}g^{ab}g_{\alpha b,a} + F_{,d}g^{cd}\left(\begin{array}{c} g_{\alpha c,\beta} - \frac{1}{2}ng_{\alpha c,\beta} - \frac{1}{2}ng_{\beta c,\alpha} \\ + \frac{1}{2}ng_{\alpha\beta,c} + \frac{1}{2}g_{\alpha\beta}g_{ab,c}g^{ab} \end{array} \right) \end{array} \right) \\ +(n-1)\left(\frac{1}{2F}\left(\begin{array}{c} 2\Delta F - 2F_{,d}g^{cd}{}_{,c} \\ -\frac{n}{(n-1)}F_{,d}g^{cd}g^{ab}g_{ac,b} \end{array} \right) + \frac{g^{ab}F_{,a} \cdot F_{,b}}{4F^2}(n-6) \right) \cdot \frac{g_{\alpha\beta}}{2} \end{array} \right) \delta G^{\alpha\beta} \qquad (2)$$

and shows us that we have not only obtained the classical Einstein Theory of Relativity [2] (see boxed terms exactly giving the Einstein Field Equations in vacuum), but also a set of quantum field equations for the scaling function F, clearly playing the role of the wave-function. It was shown in our previous publications [3, 4, 5, 6, 7] that these additional terms are clearly quantum equations fully covering the main aspects of relativistic classical quantum theory and even explain/contain components of other attempts for a unified theory like the string theory (e.g. [8]). So, we conclude, that we indeed have a Quantum Gravity Theory or Theory of Everything, as one also calls it, at hand.

“Weak Gravity” and Linearity – The Transition to the Classical Quantum Theory

It was shown in [4, 5, 6, 7] that the so-called “weak gravity” condition:

$$\delta G^{\alpha\beta}=G^{\alpha\beta}\cdot\delta_0+\overbrace{G^{ab}\delta_{ab}^{\alpha\beta}}^{\text{Gravity}}\xrightarrow{\forall\,\delta_{ab}^{\alpha\beta}\ll\delta_0}=\frac{g^{\alpha\beta}}{F}\cdot\delta_0\,, \tag{3}$$

together with a setting for the scaling function F[f] as follows:

$$F[f]=\begin{cases}C_F\cdot\left(f+C_f\right)^{\frac{4}{n-2}} & n\neq 2\\ C_F\cdot e^{f\cdot C_f} & n=2\end{cases}. \tag{4}$$

leads to a significant simplification and scalarization of the quantum gravity field equations (2), namely:

$$0=R-\frac{F'}{2F}\left((n-1)\left(2g^{ab}f_{,ab}+f_{,d}g^{cd}g^{ab}g_{ab,c}\right)-nf_{,d}g^{cd}g^{ab}g_{ac,b}\right). \tag{5}$$

This equation is completely linear in f, which not only has the characteristics of a quantum function, but – for a change – gives us the opportunity to metrically see what QUANTUM actually means, namely, a volume jitter to the metric of the system in question… at least this is one quantum option, because we have already seen others, like the perturbated kernel (e.g. see [7]).

Interestingly, for metrics without shear elements:

$$g_{ij}=\begin{pmatrix}g_{00} & \cdots & 0\\ \vdots & \ddots & \vdots\\ 0 & \cdots & g_{n-1n-1}\end{pmatrix};\quad g_{ii,i}=0\,, \tag{6}$$

and applying the solution for F[f] from (4) the derivative terms in (5), which is to say:

$$(n-1)\left(2g^{ab}f_{,ab}+f_{,d}g^{cd}g^{ab}g_{ab,c}\right)-nf_{,d}g^{cd}g^{ab}g_{ac,b}\,. \tag{7}$$

converge to the ordinary Laplace operator, namely:

$$\begin{gathered}R^{*}=0\quad\rightarrow\quad 0=F\cdot R+F'\cdot(1-n)\cdot\Delta f\\ \Rightarrow\quad 0=\begin{cases}\left(f-C_f\right)^{\frac{4}{n-2}}\cdot C_F\left(R+\dfrac{4}{n-2}\cdot\dfrac{(1-n)}{\left(f-C_f\right)}\cdot\Delta f\right) & n>2\\ e^{C_f\cdot f}\cdot C_F\left(R+C_f\cdot(1-n)\cdot\Delta f\right) & n=2\end{cases}\end{gathered} \tag{8}$$

We recognize the relativistic Klein-Gordon equation.

Thus, in the case of n>2 we always also have the option for a constant (broken symmetry) solution of the kind:

$$0=f-C_{f0}\quad\Rightarrow\quad f=C_{f0}\,. \tag{9}$$

In all other cases, meaning where $f\neq C_{f0}$, we have the simple equations:

$$0=\begin{cases}\left(f-C_{f0}\right)\cdot R+(1-n)\cdot\dfrac{4}{n-2}\cdot\Delta f & n>2\\ R+C_{f0}\cdot(1-n)\cdot\Delta f & n=2\end{cases}. \tag{10}$$

A critical argument should now be that this equation is not truly of Klein-Gordon character as it does contain neither potential nor mass, but this author has already shown that this problem is easily solved by adding additional dimensions carrying the right properties to produce masses and potentials due to entanglement, being provided by the right scaling function F[f] (e.g. [3 – 7]).

Using these results we were able to develop quantum gravity statistics [9, 10], formulate a Heisenberg uncertainty principle containing gravity [12] and even suggesting a path for answering the riddle of the 3 generations of elementary particles [13].

Do we Need a "Trans-Planckian Physics"?

Observing our variational result (2) and comparing with the classical equations from [3]:

$$R_{\alpha\beta}-\frac{1}{2}R\cdot g_{\alpha\beta}+\Lambda\cdot g_{\alpha\beta}=-\kappa\cdot T_{\alpha\beta}, \tag{11}$$

where we have: $R_{\alpha\beta}$, $T_{\alpha\beta}$ the Ricci- and the energy momentum tensor, respectively, while the parameters Λ and κ are constants (usually called cosmological and coupling constant, respectively), we realize that the following terms of (2) are just the most natural energy momentum tensor elements and read:

$$\kappa\cdot T_{\alpha\beta}=\left(\begin{array}{c}-\frac{1}{2F}\left(\begin{array}{c}F_{,\alpha\beta}(n-2)+F_{,ab}g_{\alpha\beta}g^{ab}+F_{,a}g^{ab}\left(g_{\beta b,\alpha}-g_{\beta\alpha,b}\right)-\\ F_{,\alpha}g^{ab}g_{\beta b,a}-F_{,\beta}g^{ab}g_{\alpha b,a}+F_{,d}g^{cd}\left(\begin{array}{c}g_{\alpha c,\beta}-\frac{1}{2}ng_{\alpha c,\beta}-\frac{1}{2}ng_{\beta c,\alpha}\\+\frac{1}{2}ng_{\alpha\beta,c}+\frac{1}{2}g_{\alpha\beta}g_{ab,c}g^{ab}\end{array}\right)\end{array}\right)\\ \frac{1}{4F^{2}}\left(F_{,\alpha}\cdot F_{,\beta}(3n-6)+g_{\alpha\beta}F_{,c}F_{,d}g^{cd}(4-n)\right)\\ (n-1)\left(\frac{1}{2F}\left(\begin{array}{c}2\Delta F-2F_{,d}{g^{cd}}_{,c}\\-\frac{n}{(n-1)}F_{,d}g^{cd}g^{ab}g_{ac,b}\end{array}\right)+\frac{g^{ab}F_{,a}\cdot F_{,b}}{4F^{2}}(n-6)\right)\cdot\frac{g_{\alpha\beta}}{2}\end{array}\right). \tag{12}$$

Now we see that all matter is described by wave-like field equations and that therefore our experience of the Planckian limit is completely natural, because in a universe, where matter is governed by wave equations, nothing can be smaller or finer resolved than the smallest possible wave lengths. Obviously these limits are determined by the Planck units together with the equation (12). Consequently, as these limits are properties inside the quantum gravity field equations, there is no need for any Trans-Planckian physics (e.g. [14]), especially as the scaling-recipe used in (1) and (2) is only the simplest form of a whole set of options as it was already demonstrated in a variety of previous publications (e.g. [7, 9 - 24]). The physics is intrinsically consistent through the field equations (2) and its corresponding generalizations, which include the Planckian limits simply as smallest wavelength and frequencies, based on and determined by the usual well-known natural fundamental constants like speed of light in vacuum, Planck constant and the Newton constant.

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