Sensoriums for the Ephemeral – gamification of values

Jānis Garančs

Liepaja University & RIXC Liepaja & Riga, Latvia jg@rixc.lv

Abstract

This paper introduces the author's current practical investigations, during the creation of a series of audio-visual installations and VR environments, 'gamifying' time-sequenced changes of multiple values, e.g., from financial data feeds. The work series critically reflect upon gambling tendencies in the global trading of various, increasingly immaterial assets. Algorithms and emotions of greed, euphoria, and despair meet in virtual scenery, where almost everything can be offered as a fungible and non-fungible token for exchange and trade. The project proposes speculative variations of dystopian "hybrid organisms" representing macroeconomic value exchange as a symbiotic relationship that competes for humanity's attention and involvement.

Keywords

DOI

Introduction

This work series is critically motivated by the re-emergent and growing prominence of gambling factors in global economic activities—such as institutional promotion of increasingly complex investment products for masses, crypto-asset trading, online casinos, etc.

Political philosopher Michael J. Sandel describes several last decades as a "drift from 'market economy' to becoming a 'market society.'"[1] As sociologist Georg Simmel had already observed in 1900: "Reality and value as mutually independent categories through which our conceptions become images of the world."[2]

Mapping of the behaviour patterns in trader psychology has been an important aspect of the training in the trading process, besides the implementation and development of various mathematical models. It now appears that value storage and trading infrastructure increasingly merge with methods of manipulation of human attention and emotions, and are mediated by computer networks, and increasingly—Machine Learning and AI. There is a hope, that AI-assisted macroeconomic system could live in symbiosis with human society by working closely with humans to understand and respond to their needs and goals.

Gamification of investment as a phenomenon

Various schools of economic thought, which emphasize the importance of free markets and individual choice, might argue that the gamification of investment is a natural and inevitable outcome of a free market economy. In this view, the gamification of investment is simply a response to the demands and preferences of consumers and is therefore a legitimate and desirable part of the market process. The most recent examples are various cryptocurrency and crypto-infrastructure products, meme-stock trading by inexperienced "investors," peer-to-peer loan financing, allocations of state pension funds into high-risk assets, etc. (the most extreme case being introduction in Bitcoin as the legal tender in the country of El Salvador).
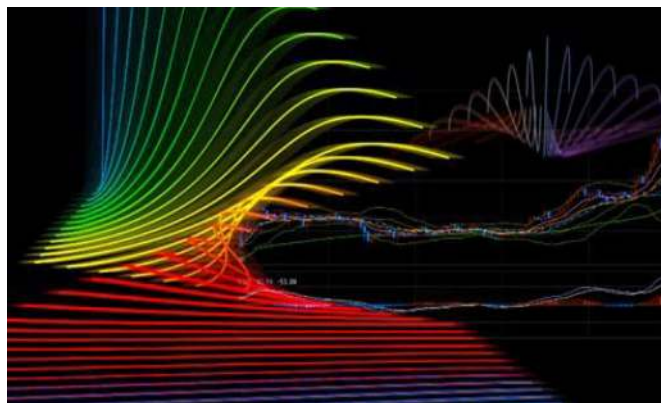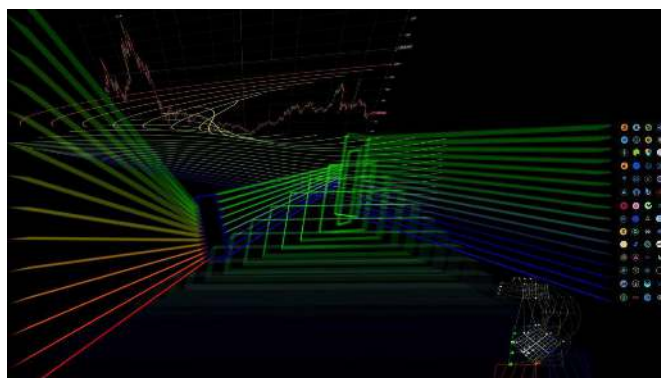

Figure 1 – Interface study screenshot

Adversary interactions between technology and legislation in economic activities, especially in finance—can be described as multilayered symbiotic relationship with society—that can manifest itself through both mutually beneficial and predatory to society by all involved actors. There have been historic precedents how rationally motivated mechanisms of value estimation, asset exchange and wealth storing has caused irrational mass behaviours, financial bubbles. That has severely impacted individual destinies, families, nations, and whole generations.

It has caught attention not only in sociology, as symptom of serious social "disease"—but also caused legal interventions of large supervisory bodies managing legislation frameworks for investments and finance.[3] Participation in online infrastructure for trading—through easily accessible interfaces, provides new tools for masses, promising control, but, at the same time, becomes part of surveillance tool for organised value brokers, setting preconditions for unfair competitiveness, "rigged game."

2 – Interface study screenshot

Simulated sensorium for immersive mappings

This artwork series—immersive installations using 3D imagery—feature variations of speculative illustration of a dystopian 'hybrid organism' and simulated macroeconomic system, whose purpose is transformation of energy and resources through a behaviour and appearance that ranges from ludic (playful) and awe inducing. One iteration uses live trading data from various sources to create a "virtual landscape" of trading activity, to observe 'passively. In another iteration, visitor can make 'virtual bets' to experience growth and diminishing of their "investment" through the cycles and complex "monetary circuits."

It is possible that McLuhan today would see immersive analytics for online trading as an example of the 'extended sensorium' in a way that media technologies are extending and enhancing human abilities in the realm of financial decision-making in "global village." The concepts of "360° gaze" (Stiegler, 2011) or more broadly *dispositif* (Foucault, 1977) are relevant how interfaces for value exchange modifies our behaviour of the mediated self under the impression of surveillance. Stiegler relates to the "data behaviourism" (Rouvroy, 2012) in the meaning of "producing knowledge about future preferences, attitudes, behaviours or events without considering the subject's psychological motivations, speeches or narratives, [instead] relying on data." There are observations, that visual representations of financial markets and sophisticated products, can be misleading by design choices or be used "as tools of manipulation" (Krawczyk, 2021).

There has been a range of historic and recent examples of 3D visualization of various data sets—as well as GUIs for various professional software products and artworks. The projects presented here, however, try to establish a gradual journey between the extremes of design strategies: intended usability/function and sublime "dysfunction" as an aesthetic experience. These audio-visual études are practical investigations into the continuum between immersive analytics and VR/AR artwork. The emerging research area of immersive analytics is considered a fusion of more recent developments in visualization, auditory displays, computing, and machine learning.[4]

Between emotional and non-emotional

How do we use technology in hybrid forms to extend our perceptual and sensual abilities? In which way do bodies merge with technological agencies? In the immersive analytics scenario, the difference between emotional and non-emotional evaluation of data refers to the use of emotional or affective factors in the analysis and interpretation of data. In a non-emotional evaluation, data is analysed and interpreted solely based on its objective characteristics, such as its numerical value or its statistical significance. This type of evaluation is based on logical and rational reasoning and does not consider the emotional or affective reactions of the user or the audience.

In contrast, an emotional evaluation of data in an immersive analytics scenario involves considering the emotional or affective reactions of the user or the audience in the analysis and interpretation of data. Also, the concept of *ideastesia,*[5] which refers to the experience of emotions in response to abstract ideas, can be applied to the above-mentioned topics in several ways—creating ephemeral audio-visual representations of "placement," "reference points"—as "spatial anchors" in VR and AR setting.

4 – Interface study screenshot

Metaphors and terms

Through algorithmic feedback, *virtual instruments* with anisotropic properties enable on-screen manipulation, switching between egocentric and exocentric navigation, and the synchronized off-screen structuring of the content. The analogy of *simulated anisotropy*—as an algorithmically simulated phenomenon of anisotropy known in physics, chemistry, microfabrication, neuroscience as direction-varying of material, tissue, and space properties.

Anisotropic properties refer to the ability of an interface to have different properties or behaviours in different spatial directions or contexts.

The notion of the *instrument* is used both as a generic definition of a task-specific tool (or toolset, involving appearance and action parameters, that be used to e.g., detect, measure, modify a specific situation or manipulate a specific object)—and in analogy to the musical, medical, or industrial instrument. Other terms "ensemble visualization" or "ensemble data" are used in the context of data visualization as "concrete distributions of data, in which each outcome can be uniquely associated with a specific run or set of simulation parameters."[6]

5 – Interface study screenshot

Data staging

For the installation, the data acquisition modules feed from several sources of financial data (stock- and cryptocurrency exchanges, aggregators, etc.) over their public Internet APIs. Installation accumulates historic and realtime trading data in the local data cache and uses provided calculations of trading trends and indexes—further calculations on the time-series data. Various time zoom scales reveal the phases of past, historic trends, that emphasize the position current trade execution as a spatially expressive metaphor. Visualisation and sonification modules utilise several specialised financial TA (Technical Analysis) programming libraries to dynamically calculate sections in the audio-visual score for the real-time 3D graphics and sonification engine. The use of consistent spatial arrangements helps to create a sense of order and coherence in the visualization, revealing flows of market movements, and identify relationships and patterns within the data.

Audio-visual staging

In the scenes, the progressing complexity or visitor-triggered mode shifts induce a challenge to the audio-visual sensorium: the experience of the conflation within multiple reference systems and plays with the visitor's perception effort of "sense-making."

Various sound properties, such as pitch, timbre, rhythmic elements are juxtaposed in linear-and non-linear grids and ephemeral relationships are revealed and emphasized by spatially organized audio-visual cues (perspective, sharpness/blur manipulation), audio-panning, and timbral modulation, allowing the viewer to easily distinguish between changing context without having to rely on visually "scanning" the chart. This can be particularly important in complex or dense scenery, where a well-organized spatial arrangement can help to reduce cognitive overload.

Data representation axis and colours

Axes, colours, and timeline of time series data such as stock or currency trading are typically represented in a consistent manner across cultures and regions. However, asset value increase usually mean economic gains, however, in specific trading mode—"shorting," that is a bet on asset value loss and the gain is "reversed." Else, there are some differences that can be attributed to a combination.

Conclusion

Algorithmically manipulated financial trading is an arena where algorithms merge with human emotions and drives like greed, FOMO ("fear-of-missing out"), euphoria, confusion, and despair into a global hybrid sensorium. As a phenomenological effort, this work proposes a set of parameters for simulated anisotropy, useful for designing the structure, notation, and physical, mathematical dimensions in the VR interface and environment. The framework for simulated anisotropy instruments is envisioned as a contribution to the emergent fields of immersive analytics and neuroaesthetics, developing guidelines for a hybrid interaction system, consisting of networked hardware specifications and custom-developed software modules. This project will implicate experimental strategies with uncertain capacities in the effectiveness of interaction, and impact of integrated audio-visual language, expanding the vocabulary of spectromorphology.[7] Future intentions for this project, using techniques such as

sentiment analysis to assess the emotional tone of user feedback or comments, or using physiological measures, such as heart rate or galvanic skin response, to assess the user's emotional response to the data.

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7 Manuella Blackburn, *The visual sound-shapes of spectromorphology: An illustrative guide to composition,* Organised Sound Volume 16 Issue 1 April 2011 of cultural and historical factors, as well as the specific requirements and conventions of each culture – in few Asian cultures, axis, and colours for positive/negative chart values (up/down or green/red) are swapped. The discussed experimental artworks implement perceived relativity of orientation axes and colour schemes to establish ephemeral cognitive associations, that are enhanced by artificially synaesthetic bindings.

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