Convergence of Media in Artificial Life --- Dilemma or Human's Nature

Vedran Vucic[1] and **Henrik Hautop Lund**[2]

[1]MTS Electronics, Skadarska 40, Belgrade, Yugoslavia. e-mail: vvucic@opennet.org

[2]The Danish National Centre for IT Research -- CIT, University of Aarhus, Ny Munkegade, Bldg. 540, DK-8000 Aarhus C, Denmark. e-mail: hhl@daimi.aau.dk http://www.daimi.aau.dk/~hhl

> *Bestimmt, Erleuchtetes zu sehen nicht das Licht.*
> J.W. Goethe, Pandora

Introduction-Question

In this short essay we want to question the basic preconceptions about our perception and rigid mental maps about semantics of meaning in arts. This essay is based on our personal artistic experience in composing music and creating computer images using software packages based on ideas which are at the foundation of Artificial Life and in some way of Artificial Intelligence. Our idea is not to give final answers but, rather to provoke discussion about new ways of thinking and perception which put us in situation to rethink our approaches to the arts and ourselves.

We were always fascinated with Leonardo's curiosity about the human's anatomy more than with his anatomical findings because, it seems to us that as sometimes in arts, findings usually have much less importance than research itself. Or, findings should have energy of research built-in themselves in order to be valid. We are among those contemporary artists who feel that the artists cannot avoid their fate; to be again challenged by the invisible, or at the moment, incomprehensible unintelligible human's characteristics. After first primal fascinations with fear of the unknown we are more becoming curiously fascinated with unknown algorithms of organizing and structuring dynamics of information, perception, media of senses' activities and cognition.

We can say that the most challenging question for us is how to open the Pandora's box and to enter into dreams kept inside because they never forgive. However, surrealists were ready to be victimized by the challenges they were going through. We want to create art pieces as the algorithms which are transactions of transcontextual interactions between senses and algorithms of learning and transcending the time from within. Convergence of media is a dream in which such pictures and scenes are taking place. That means that the basic meaning is created by the transaction between the basic elements which are previously considered and understood as the part of a certain media (i.e. visual, sound, dance etc.) Since, in many cases, media lost their autonomy, their parts started to interact from within and among themselves and to create an eternity of possible relationships between senses, mind, subconscious dynamics, and senses.

User-Defined Evolutionary Algorithms - Non-Composition?

Artists were in the past fascinated with mystic, mythological, secret, forbidden; they were trying to discover the light in the darkness. From our point of view, there is no darkness, there is no light, because we could be you, you could be part of any planet or star, dust lost in the eternity of the universe, plant, bird, fish or dying humpback whale. We have in our bodies too much whirlpools of time, energy and matter to be fascinated with artifacts which are finished, completed, classified, boxed, labeled. In contemporary arts, like in surrealism, it is becoming paradoxically fascinating that so-called Artificial Life became less artificial than ever. Neural networks, fuzzy logic, evolutionary algorithms, robotics are becoming the new artist's tools instead of brushes, pens, paints...

Life as it could be, life as it is, life from within in timeless time and placeless space; life between matter and energy, between senses and transcendence, life as sound generated by images, image generated by the movement --- dynamics without explicitly saying what it is. Though many artists use a variety of tools in the sound synthesis, visual effects, all kind of distortions, we think that the genuine creativity resides where graphic or sound sources appear in a form of extracted algorithms of our basic perceptional and cognitive crossroads. Maybe one could, while attempting to categorize what we have just said, recall to the early psychoanalytical writings of C.G. Jung, Sigmund Freud or to the writings of the nuclear physicists. But, we think that regardless of numerous efforts in writing about modern arts, there is enormous power from the point of view of interactivity and potentials for trans-semantic interactions in intermedial user-guided evolutionary algorithms and neural networks applied in arts. It seems that neural networks and user-guided evolutionary algorithms are suitable to enable us to open our potentials for opened and dynamic temporal trans-semantics of artifacts which more and more look like living organisms.

We frequently forget that we cannot step in even once in the same river since its waters are flowing on continuously though the Ancient Greeks cautioned us about that indispensable conclusion. Actually, the human' s potentials are, we hope, curious with our disability to open ourselves. Unfolding the logic of change, discovering the inner evolutionary transformation algorithms is at the core of our approach to the arts, perception and cognition.

Though it can sound contradictory, we think that the advanced technology overcame the rigid induction-deduction mechanisms of our civilization. For example, it is known that so-called artificial neural networks, evolutionary algorithms, fuzzy logic have a certain flexibility in testing inputs, learning and discovering trends and predicting potential outcomes from given inputs. Including some elements from the theory of probability helps a lot in terms of putting some new dimensions to the artifacts we create. Reflection on algorithms of learning, trans-situational meaning, dynamics of perception is not so abstract and mystic. It is in front of us, on the screen, on the paper, in loudspeakers, in movement.

Self-evolving Music

It is quite interesting to note, that we often like live music and improvisations such as jam-sessions the most in music, even though that the unpredictability of these

performances are not represented in recorded music. We can play recorded music over and over again to get the similar experiences, but often we eventually get bored with the predictability of this music. We need change and movement, and therefore we need music that within a given framework is able to express change and movement. Self-evolving music delivers this. It has found its inspiration in nature where everything is changeable and can change both over the course of short periods and longer periods (such as during an evolutionary process). We are exploring how to use these concept in composing music and in making artistic paintings, and ultimately we want to combine the two approaches to a dynamic art that co-evolves music and images.

Though we use a variety of music software packages, we are frequently composing music with one very interesting software package called Koan Pro. Koan Pro. is produced by SSEYO Ltd. and it is a powerful and easy-to-use music software which is based on the music engine which continuously calculates parameters we define as inputs or basic changeable structures of our music piece. That's what we wanted since we were very disappointed by the very fetishist character of music. Koan Pro. enables us to compose generative music and to give up the usual artist's narcissistic enterprises of producing mirror images, literature or illustrations of his/her life. By controlling more than 200 music parameters which can be mutated, opened, and randomly played, we get closer to our ideal: listen and play echoes of algorithms of silence. With Koan Pro., the composer takes into account openness of his/her musical elements, probability of their appearances, developments of mutations over time, interactions between mutations, interactions between probabilities, generative seed-notes various beginnings of a piece when it is repeatedly played and by itself different developments.

Instead of creating a self-referent strictly defined music piece, the composer now composes a piece of inter-referent self-evolving and ever-changing music organisms. A music piece becomes a sort of living organism with all the internal dynamic changes and rules, mutations and flexibility a composer could ever dream of. Finally, the music is not any more puzzle of "just another sequence" music phrases which are like bricks in the wall. Following the cautions of the Ancient Greek philosophers, music may be continuous flow of the waters of ever-changing rivers of time and space.

Artificial Life and Life Algorithm Images

It seems to us that the humans were born with that very painful luck to be challenged by the prisms of distance. Maybe, that's the reason why we are attracted by the image generating software called Artificial Painter made by Henrik Hautop Lund, Luigi Pagliarini and Orazio Miglino. The Artificial Painter is image generating software based on neural networks and user guided evolutionary algorithms. At the beginning of each evolutionary session, it generates 16 random images which are a sort of "seed-images" for the real computer painter to start to work. One can choose four of them which the computer treats as individuals and immediately after as parents which produce 16 new individuals constituting a new generation. The painter can zoom out each of images, carefully look at them, observe tendencies, trends, changes and interactions of composition, color, texture, form, perspective and their respective interactions. The only parameter one can control is mutation percentage and of course, choice of individuals which will become parents and generate new generation of 16 individuals under mutation percentage we define for particular generation. We can assign different mutation

percentage for each generation. Each single picture is constructed by an Artificial Neural Network that, as an animat, is placed in a grid-world with two landmarks placed at different positions. In fact, the idea of The Artificial Painter emerged from Artificial Life simulations, in which we wanted to evolve animats to perform landmark navigation. In order to study the characteristics of the single Artificial Neural Network, we found inspiration from the diagnostic and neurobiological techniques for brain scanning, such as positron emission tomography (PET), computed tomography (CT), and single neuron records.

Thus, visual echoes of the human's brain silence became the source of immense of textures, color, composition, light, etc. in images generated in the Artificial Painter. In order to be creative in the process of evolutionary artistic image generating by the creation of generations and mutation control, we have to be able to perceive inner algorithms of change of texture, color, figure, composition, perspective and perceive that we are likely to experiment with various mutations of inner dynamics and algorithms of images. We think that such ability is not anything extraordinary. We strongly believe that it is inherent to the humans. We have spent a number of curious and sleepless nights in unchaining our perception from the logic of everyday life. It is needed to lay down on the bottom in the river of dynamics of whirlpools of energies that consist us.

Evolution vs. Givenness - Lost Game or Openness?
Whenever we compose a music piece or whenever we are preparing ourselves for talk or exhibition we ask ourselves: "Why would one recognize any value in anyone's artifacts?" or "What is the model of inner dynamics which attracts someone to perceive evolutionary content of the artifact?" By asking such questions, we are trying to question the phenomena of givenness of the artifact. One of the most unpleasant and painful words which can be connected to the artifact is its givenness. The givenness of the artifact is its negation which boxes it into frame, title, direction. That unbearable givenness, sense that something is completed, habit of consuming the products is what we appreciate the least in arts, though we know that a certain givenness necessarily exists. That's not aesthetic manner or approach only. Though the terms as perception, artifact, visual arts, dance, music are necessary, we think that these terms are rather preconceptions or words which are insufficient for describing what could be highly interactive, dynamic and evolutionary process of creation of generative arts. The development of technology allow us to bridge the distances easily, to participate actively in interactive sessions with people gathering from the most distant parts of our planet. Of course, there is certain interaction in various distant talks, stand-and-watch exhibitions, playing music pieces and even interactive music concerts. But, in the case of simultaneous interactive evolutionary artistic sessions there is, from our point of view, much more chance for evolutionary cross-cultural trans-semantic generative arts.

Vedran Vucic and Henrik Hautop Lund

This essay is dedicated to Luigi Pagliarini and Orazio Miglino for their inspiration, hard work and creativity.