THE OKSIMO PARADIGM
An Introduction (Version 2)
*

Gerd Doeben-Henisch
gerd@oksimo.org

July 30 - Aug 1, 2021

Abstract

This text introduces into the new oksimo paradigm of coding reality by groups of people. While the preparing discussions for the oksimo paradigm can be found in the texts published in this uffmm.org eJournal, the first publication of the software and applications has been transferred to the new oksimo.org site, accompanied by the oksimo.com site for the software usage.

1 A World with Actors and Expressions

The oksimo paradigm [OP] assumes that there exists an *observable world* E with *properties* P. Part of the properties are *actors* A, *expressions* EX, and *output properties* O of the actors. The actors can perceive some properties of the environment – including other actors – because these properties are mapped onto the actor.

$$OP(x)\ iff\ x = \langle E, P, A, EX, O\pi_0 \rangle \tag{1}$$
$$E := Environment \tag{2}$$
$$P := Properties \tag{3}$$
$$A := Actors \tag{4}$$
$$EX := Expressions \tag{5}$$
$$O := Output\ properties \tag{6}$$
$$P \subseteq E \tag{7}$$
$$A, O \subseteq P \tag{8}$$
$$EX \subseteq O \tag{9}$$
$$\pi_0 : P \longmapsto A \tag{10}$$

2 Actors Inside

One can look to the actors of the oksimo paradigm as *adaptive input-output systems* having some *sensoric states* S capable of registering some environmental properties $PS \subseteq P$, having *internal states* IS, and having output properties O. The sensoric states S can be mapped into parts of the inner states IS, these inner states can change to some degree, and parts of the inner states can be mapped into observable output states O. Furthermore it is assumed that actors of the oksimo paradigm have a *behavior function* ϕ which determines the occurrence of the output states O as well as possible changes inside the internal states IS depending from the actual sensoric states S and the actual inner states IS: $\phi : S \times IS \longrightarrow IS \times O$.

One basic distinction within the inner states is the partition into *cognitive states* COG and *inner expressions* EXI. A *meaning function* μ maps both sets into each other: $\mu : COG \longleftrightarrow EXI$. The inner expressions EXI can be mapped into external expressions EX and vice versa.

$$ACT(x)\ iff\ x = \langle S, IS, COG, EXI, O, EX, \pi_1, \mu, \phi, \rangle \tag{11}$$

$$S := Sensoric\ states \tag{12}$$

$$IS := Internal\ states \tag{13}$$

$$COG := Cognitive\ states \subseteq IS \tag{14}$$

$$EXI := Internal\ Expressions \subseteq IS \tag{15}$$

$$O := Output\ properties \subseteq P \tag{16}$$

$$EX := External\ expressions \subseteq O \tag{17}$$

$$\mu : COG \longleftrightarrow EXI \tag{18}$$

$$utter : IS \times EXI \longrightarrow EX \tag{19}$$

$$\phi : S \times IS \longrightarrow IS \times O \tag{20}$$

3 Language, State Descriptions, and Stories

A *language* L is understood as a set of expressions EX which are in time interval (t, t') understood as *accepted expressions* by a sufficient amount of members of a certain *population* POP using L. Thus if an actor A is uttering an expression $e \in EX$ than one has to assume that this expression e is assumed to be an accepted expression of L and therefore the *learned meaning function* μ can be applied to *decode* the expression into some internal meaning $\mu(e) \subseteq IS$. For any kind of *normal language* L one can assume, that the meaning functions of all actors are partially *synchronized* to enable some synchronized coding effects called *understanding*.

To that extend that parts of the properties P of the environment E are represented in the inner states IS of communicating actors by exchanging expressions of their language L one can assume that the actors can *describe* certain parts of their environment with the aid of their expressions. Thus if Peter sits at the table, it is morning, and Chris stands actually before the refrigerator, than Peter could state (simplified): *There is no butter on the table.* And Chris could get some butter from the fridge and put it on the table. Then one could state: *Butter is on the table.*

We can reconstruct (simplified) three *scenes*: (i) *There is no butter on the table.*, (ii) *Chris gets some butter from the fridge and puts it on the table.*, and (iii) *Butter is on the table.*

For a computer these expressions (i) - (iii) as such have no meaning. For a human actor – if he is trained with English language expressions – he maps these expressions into his learned internal meaning space and will associate these internal states with some properties of the outside world in the kitchen. Usually an actor with language L can *decide* whether an expressions *agrees* in his understood meaning with a given situation SIT of his environment E. If an actor decides that an expression E agrees with some part of the environment than he will call such an expression e *true*; otherwise not.

If the expressions are *actually not true* but are understood as *being possibly true in some future* then these are called *visions* and can be used as *goals*, which one wants to achieve.

Actually true expressions as well as possibly true expressions are understood as *symbolic representations* of a *state*. *Sequences* of such symbolic representations are understood as a *story* describing a *process*. In the real world a sequence of states has only *one path*, the course of events which has *really occurred*. A story in the *written format* can describe many different courses/ tracks *in parallel* thereby showing *different kinds of options*. Nevertheless in the real world only one of possibly many paths can happen.

If people want to prepare themselves for the intended *best options* of their own possible future then they can use the instrument of story-telling to try to make some possible options visible. But the *quality* of such a *future picking* depends from the available knowledge as well of the estimates about the many non-linear causes of possible effects.

An important aspect of such a future-minded story telling is the inherent complexity of processes and the limited capability of human brains to imagine such complexities. Thus the analytic capacity of story telling can only be enhanced if one enlarges the possible complexity of such stories. This can be done by transferring a story into a *simulator* which can generate on demand all wanted and interesting options.

4 Simulated Stories and their Evaluation

While the idea of *simulation* is quite old the *oksimo paradigm* offers some *new option*: basically, write your story in (every!) *normal language* and the oksimo simulator takes this normal language story *as input for a simulation*. This allows everybody – and even every group of people – to tell their stories in normal language (every normal language!) and then look what happens with the different options. How is this possible?

In the simple case the expressions representing two different states can be *equal* or *different*. If different, then the *difference of the expressions indicate a difference in the meaning*, which points to the intended part of the environment. Such a *difference* can either point to *something new* or to some *properties having been deleted*. Therefore one can describe a new state description by two formal operations *Eplus* and *Eminus*: a new state S is then the result of adding Eplus and removing Eminus from the preceding state: $S_{new} = S_{old} - Eminus + Eplus$.

Such an operation is in the oksimo paradigm called a *change operation*. Such a change operation is *embedded* in a structure called *change rule* with the format: <COND, Prob, Eminus, Eplus>. This reads as follows: If the old state description S_{old} contains the expressions of the condition part *COND* as a subset, then the rule is allowed to be applied. The probability of realization is given with a number *Prob* [0,1], and the new elements and the to be deleted elements are given with *Eminus* and *Eplus*.

Thus, if one has one state given as a *start state* S and a set of *change rules* R then one can see the *simulator* Σ as an *inference machine* $\models$ in the format $S \models_{\Sigma,R} S'$ with S' as the new follow up state.

If one adds to the start state S a *vision* V as an intended *goal*, then one can use such a goal as an *evaluation criterion* in a way like $S \models_{\Sigma,V} \%Goal$. Thus during the whole simulation one gets continuously a *comment* about the degree of agreement between the actual computed state S and the intended goal V.

5 Playing Stories

As everybody knows to read a text or to hear a story is one thing; to play a story together with others as a real process is something different: while playing you are involved with your whole existence including not only cognition and experience but also different kinds of feelings and emotions. Besides this you probably will decide in cases of options differently, more conscious, than when you only hear or read the story in more 'distance'. Especially, if you are not playing 'alone' but being 'part of a team'.

Such a *playing mode* is a standard mode of the oksimo paradigm besides the simulation mode, which is always active. There exist even two playing modes: (i) in the *passive* mode you are playing but you can only behave within the existing rules (the change rules). (ii) In the *active* mode you can define new rules while you are playing. This is a *co-creation* mode, a kind of *programming on the fly*.

6 Artificial Actors

For the *oksimo simulator* Σ it makes not a great difference whether a *player* is a *human* actor or an *artificial* one. Thus the oksimo paradigm allows the usage of any kind of artificial actor either alone or in parallel to human actors.

7 AI: Optimizing or Creative

Every oksimo story represents – together with the simulator – a *problem space* ($\mathcal{P}$) which is the genuine environment for all kinds of ai algorithms. Indeed one will need *only one* ai algorithm for *all kinds* of oksimo stories. While a simulation can check *only one path* at the same time an optimizing ai algorithm can check potentially *all paths* in the light of the vision evaluation. Therefore if one is not interested in playing, training, learning as such one can use the oksimo paradigm as professional tool for most kinds of search tasks in finding the best solution in a given problem space.

The today often thematized problem of the *credibility* of ai algorithms vanishes within the oksimo paradigm completely. It becomes a 'pseudo problem'.

While the optimizing ai algorithms are bound to a given problem space there is the interesting question, how one can help human actors to improve their problem space as such. In general this *problem-space variation* problem is completely unsolvable, but nevertheless it can be of help to support human actors to overcome their *opinion bias* by *playing around* with the framework of the problem space as such. Because a *framework for a framework* is in the general case radically *open* the different possible solutions can only be of heuristically nature. Nevertheless, perhaps there exist situations where it can be of some help. At least this kind of task could eventually train human actors in questioning their own biases.