Reception of literature generated by artificial neural networks

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> The miracle of electronic literature is not that computers are current; the miracle is that it is so thoroughly anticipated, suggesting that the literary perspective is a viral, feral, primordial tendency of human consciousness.
>
> David Heckman and James O'Sullivan (2018)

Literature written by neural networks can be considered a recent example of literature produced and presented by technology, which is broadly captured by the encompassing term "electronic literature". Theoretical considerations of electronic literature offer several ways of contextualizing its historical background: either it is seen as a continuation of experimental tendencies in (print) literature, or its technical and multimodal nature is emphasized and it is seen as a distinct genre with its own history. As Chris Funkhouser stated: "Digital poetry always exploits elements of mathematics, computer science and art, but many other conceptual approaches are applicable. Combining files and presenting them via computer screens multiplies possibilities for poetry and, considering the sum or sums of the artistic equation used to distinguish meaning, requires work from the author and the viewer" (2012, 227).

Some theorists have approached this issue by creating their own terminology: the Norwegian theorist Espen Aarseth coined the term "cybertext" to include digital games and various media projects in addition to computer literature, thus drawing attention to the connections between these digital projects. Aarseth stressed the complexity of decision making within the reception process compared to the traditional literary text. He coined the term "ergodic literature" for the historical background of cybertexts and used it to refer to literature whose reading emphasizes both

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the reader/user's choice to progress through the text and the increased demands it places on the reader/user (1997). Aarseth used this term to refer to an array of different texts, ranging from inscriptions spread out over multiple walls of Egyptian temples, the *I Ching* (or *Book of Changes*), calligrams, and novels without binding, e.g. Marc Saporta's *Composition no. 1* (1962; Eng. trans. 1963), B.S. Johnson's *The Unfortunates* (1969), and Raymond Queneau's *Cent mille milliards de poèmes* (1961; *A Hundred Thousand Billion Poems*, 1983), to experimental novels with various reader's instructions, such as Milorad Pavić's *Hazarski rečnik* (1984; *Dictionary of the Khazars*, 1988) and *Predeo slikan čajem* (1988; *Landscape Painted with Tea*, 1990), Vladimir Nabokov's *Pale Fire* (1962), Julio Cortázar's *Rayuela* (1963; *Hopscotch*, 1966), and Mark Z. Danielewski's *House of Leaves* (2000).

The American theorist N. Katherine Hayles (2002) describes experimental works whose content and form/medium are inherently intertwined as "technotexts", referring to medial as well as printed works. The term "protohypertext" is used for older works that were printed but still navigated the reader's attention similarly to hypertext (using various instructions to find specific, non-sequential pages instead of clicking on a link).

Fig. 1: Georg Philipp Harsdörffer: *Fünffacher Denckring der Teutschen Sprache* (1651, 517)

HISTORICAL BACKGROUND OF GENERATED LITERATURE

Due to its technical background, the use of neural networks in literature has no direct historical antecedents. However, it is possible to find works that are to some degree similar to this approach through a combinatorial poetics.[1] One such example is *Fünffacher Denckring der Teutschen Sprache* (Five-fold thinking circle of the German language), a project by the German author Georg Philipp Harsdörffer from 1636 (printed in book form from 1651), which was intended to assist authors in poetic creation and to produce new words through combinatorial word formation. This "thinking circle" consisted of five differently sized circles attached to a single center, each circle containing specific morphemes: prefixes, letters, syllables, and suffixes. Word-formation thus consisted of a mechanical rotation of the circles, with words being formed by random combinations of individual word-forming elements.[2]

The permutation scheme of the sonnet genre was used by the French poet Raymond Queneau in the creation of his experimental book *A Hundred Thousand Billion Poems*. The book consists of ten sonnets, which are to be cut up, with the individual verses mutually combined. It would take longer than a human lifetime to read all 10^{14} sonnets, and so this poem defined the approach of the OuLiPo movement, which translates as the workshop of "potential literature", a literature that fully exists only in its potential state. In the same year (1961) that Queneau published his book based on "ergodic" reading, the Italian poet Nanni Belestrini created *TAPE MARK 1*, a poem based on an algorithm that used a series of sequential processes to combine fragments from Michihiko Hachiya's *Hiroshima Diary* (1955), Paul Goldwin's possibly apocryphal *The Mystery of the Elevator*, and Lao Tse's *Tao Te Ching* from the fourth century BC, and published them on magnetic tape.

The first literary works created through computer generation are considered to be the *Love Letter Generator* by English computer scientist Christopher Strachey from 1952 and *Stochastische Texte* (*Stochastic Texts*, 2005) by German computer science student Theo Lutz from 1959 (Strachey's generator is also regarded as the first work of digital art). While Strachey's project had humorous overtones and the algorithm in the Mark 1 computer chose from overly sweet or humorous appellations and euphemistic words, always signing itself as M.U.C. (Manchester United Computer), Lutz's generated text consisted of short sentences of purely informational value (e.g., "Ein Weg ist offen.", "Nicht jedes Auge ist alt.", which can be translated as "One road is open.", "Not every eye is old."[3]). This fact fits the context of its creation: it was a student project created for a specific assignment for a university course. Theo Lutz was a member of the Stuttgart Group at the Technical University of Stuttgart, whose members included the philosopher Max Bense (Lutz's teacher) and Reinhard Döhl. Lutz's *Stochastic Texts* are based on the appropriation of 16 nouns and adjectives from Kafka's novel *Das Schloss* (1926, *The Castle*, 1930), to which articles, negative forms, or the verb "is" are added. These are then connected to the next generated sentence by the conjunctions "and", "or", "and so". Strachey's approach was more complex and can be seen as a remediation of love letters with a heavy dose of genre parody: "Duck Duck. You are my little affection:

my beautiful appetite: my eager hunger." This intertwining of emotional and computational dynamics, according to David Link ("the software is based on a reductionist position vis à vis love and its expression") results in love being "regarded as a recombinatory procedure with recurring elements" (Link 2016, 63–64).

As these very early examples show, the choice and development of a usable database is the most essential human intervention at the linguistic level. Or as the saying goes among computer scientists: "Show me your database, I'll tell you how good your project will be."

House of Dust (1967) by the US-based Alison Knowles, a performer linked to Fluxus, and the programmer James Tenney is often cited as a memorable piece of generative poetry because it was consciously created as a literary work by a computer. It was also published in several magazines, in book form, was the basis of an interactive sound installation, both as a physical sculpture and as a performance, and can thus be categorized as a transmedia work.[4] Its scheme was very simple, each of the four lines consisting of the same basic structure: the first phrase in each line ("a house of", "in a", "using", "inhabited by") was followed by a specific, randomly generated continuation. While the basic words always repeated, the other parts of the verses changed generically. These stanzas were linked in series, printed on long paper, and published in the form of a concertina book. *House of Dust* is an example of how the author's approach to the "inhuman" product and its professional contextualization sometimes plays a greater role than the artistic output itself.

EARLY CZECH AND SLOVAK GENERATIVE ATTEMPTS

In the Czech environment, three attempts at computer text generation are known from the 1960s. The authors were not primarily concerned with the creation of poetry. The generated poetry was seen rather as a by-product of their scientific intentions. In 1966–1967, the Brno-based literary theorist and versologist Jiří Levý and the linguist Karel Pala worked on a project called Generování veršů jako problém prozodický (The generation of verse as an issue of prosody), the aim of which was to more deeply explore the structural theory of text and to place it on a verifiable basis – which was to be represented by computer-generated poems, dubbed "artificial poetry".[5]

Like Theo Lutz's *Stochastic Texts*, excerpts of these poems were published as part of a scholarly article (Levý and Pala, 1968). The first poem was compiled by randomly selecting from 116 generated sentences; the second was also selected (this time from 220 sentences) but with a certain thematic intention, and thus authors admitted that this sample "has to some extent the character of a real poetic formation" (77). The most significant human intervention in the generated text is the selection itself, which in the latter case even assigns to the generated sentences the meaning of a love poem.

The second attempt to generate a poetic text is also connected to the scientific community in Brno. As suggested by its title, the article, "Některé principy strojové poetiky" (Some principles of machine poetics) by Karel Pala and the literary critic Oleg Sus consists primarily of a brief introduction outlining the possibilities of com-

puter-generated verse (in a more dense and comprehensible form than Levý and Pala's paper), followed by examples of generated poems. The fact that it was published in the literary magazine *Host do domu* in 1967 also led the writers of the article to polemically define the position of machine poetry and experimental or concrete poetry. Sus and Pala consistently insisted that computers do not produce true poetry but only parapoetic poems ("machine parapoetry"), that is to say, texts that are comparable to "natural"/non-machine poetry, but whose structure bears no trace of any authorial personality or intentionality, which they considered necessary in "real" poetry.

Oleg Sus published a generated text in the same journal, *Host do domu*, in the politically heated atmosphere of 1968. The text was generated using words taken from a speech by Jiří Hendrych, a member of the Communist Party of Czechoslovakia's Central Committee and an opponent of the ongoing reform efforts in society and culture. Sus did not hide his intention to mock the Communist leader's phrases in a neo-Dadaistic way, but at the same time he presented the parodic character of the generated text as the ideologically unbiased and objective result of computer algorithms, which merely created new combinations out of the provided linguistic material.

The first generated poems in Slovak started to appear in the 1980s. The series called *Obrazobásne* (Imagepoems) by the visual artist Daniel Fischer was created by means of generation on a CDC3000 computer and subsequent plotting, through which the written quotation gradually "disintegrates" into a cubist visual form. This was not an authorial text; Fischer used an appropriation reminiscent of conceptual work with text. Poems that can without hesitation be considered as generative poems were published by Rudolf Legel in 1982 in the article "Experiment s interakciou človek–počítač pri vytváraní básnického textu" (Experiment with human–computer interaction in the creation of a poetic text). For the first poem, "Analyticka geometria v priestore mojej hlavy" (Analytic geometry in the space of my head), he selected keywords from the terminological field of analytic geometry; the words of the second poem "Laska" (Love, both titles intentionally without diacritics in Slovak), come from Dante's "Horská kanzóna" (originally "Canzone Montanina") in Viliam Turčány's translation. The poetic construction of both poems is based on sentences; the language of the first poem is enriched with mathematical signs and the language of the second poem brings a romantic expressivity. Legel edited the computer-generated text to make the declension work properly in the poem, arguing that "the advantage of using a machine in text construction is that the machine can select quickly from large data sets, and the distribution of selection is programmable" (1982, 39).[6]

All of the aforementioned projects were based on the combinatorial principle of computational access to data: a human created a database of words that were syntactically ordered and inserted a number of words into the category of the chosen syntactic member. Thus, the computer always just chose from the set of words, but did not change the default syntactic structure. The notion of randomness was thus relative because the author of the project had to create the database in such a way that the outputs were grammatical in different combinations and could thus be considered poetry.

DESCRIPTION OF TEXT-GENERATING NEURAL NETWORKS

Neural networks do not work on the same principle as the previous examples of generated literature. The author of the project does not supply the program with words that are subsequently rearranged by the machine into the final text, nor does he provide it with the rules of morphology and syntax. The machine learns the language structures itself.[7] The basis of neural networks is that the program learns to recognize certain patterns on a large database and then tries to replicate or approximate them, thus generating its own data. However, neural networks do not understand the level of language, they function only on the level of numbers. First, all text is converted by the algorithm into strings of numbers in which the network then looks for sequences. Once the network has produced its own sequences, the algorithm converts them back into alphabetic characters. Therefore, a neural network does not know that it is forming text; for this program, text is still just a sequence of numbers. Neural networks generate by predicting the next sign to complete the sequence of numbers, so converted to characters this means that they complete the next characters in the sequence.

A neural network learns by gradually and repeatedly going through the entire volume of data, and its resulting outputs improve with respect to the number of cycles it has gone through. The first outputs are just clusters of letters, later they take the formal resemblance of words without any meaning, then it starts to produce words, and finally the combinations of words constitute verse. However, it is necessary to stop this learning at the right moment, otherwise overtraining occurs and the outputs start strikingly resembling the primary data.

In the use of neural networks for text generation, two types of language models have been used in the Czech and Slovak Republics: Recurrent Neural Networks (RNN) and Open AI's Generative Pre-trained Transformer 2 or 3 (GPT-2 or GPT-3). RNNs started to be more widely used for text generation when the Slovak-born American researcher Andrej Karpathy published his 2015 paper "The Unreasonable Effectiveness of Recurrent Neural Networks", in which he described how he trained his neural network on the works of Shakespeare. He used a character-by-character (rather than word-by-word) generation method to do this, and found that the network gradually began to learn to form words and even copy Shakespeare's style. When working with RNNs, programmers create their own database on which the networks learn, and so many such projects have worked with old texts that are no longer subject to copyright.

GPT-2 is a language model already pre-trained on a huge text database (8 million texts from Wikipedia and Reddit, amounting to about 40 GB), whose library consists of so-called tokens, which are numerical representations of subwords. GPT-2 tokenizes via the BPE algorithm, which means that it takes all the unique words present in the database and breaks them into smaller parts. In this way, the algorithm breaks the words to get tokens, in which it then looks for a sequence. By that sequence, it learns how a particular language works, what the sentence structure looks like, and so on. GPT was trained on English, but it can be fine-tuned to another language, that is, it can be trained to follow the linguistic rules of another language as a superstructure over English syntax.

After training the network, programmers can work with specifying parameters that determine such characteristics as the length of the output text (the number of tokens), how non-conventional it should be (referred to as the *temperature*), how many outputs to create per password, etc. Often the neural network is given an initialization text – a seed phrase it is trying to follow (a word, a paragraph, a chunk of text) – in order to correctly navigate to the desired output. However, the network can also generate without an initial text.

The GPT-3 model architecture works in the same way as GPT-2, but it is trained on a much larger dataset (it consists of five different Internet corpora), requires a much larger amount of RAM (reportedly around 11 home computers), and is therefore difficult to fine-tune on a different dataset. The first transformer in this series, GPT-1, on the other hand, was trained on the smallest database, called BooksCorpus, consisting of 7,000 unpublished books to the sum of 117 million parameters. In contrast, 1.5 billion parameters were entered into the training of GPT-2 and about 100 times more were entered into GPT-3.

TYPES OF TEXT GENERATION IN NEURAL NETWORKS

Considering the specifics of programming interventions in training neural networks, machine learning can be categorized as supervised, unsupervised, and semi-supervised learning. Most text generators use unsupervised learning. In the context of text corpus construction, we can divide authoring approaches into those that use task-specific models and those with generic models. With respect to task-specific models, we can talk about a learned model or a generic model that is later fine-tuned by the authors for their own specific needs. With a generic model, we talk about a direct use of, for example, the GPT model in the English language without any modification or fine-tuning of the model. The advantage of fine-tuning is that a language other than English can be used, and thus the model can learn to write in another language due to its corpus. When it comes to small languages, many authors usually only translate texts that have been generated by the English generic model and abstain from the time-consuming fine-tuning.

Even though the Czech and Slovak literary scene has not produced a large number of literary projects with the GPT model,[8] we can say that with regard to the reception of digital literature, these have been the most media-reflected examples. Three contemporary projects have been implemented by the prominent duo of the new media theorist and philosopher Dita Malečková and the programmer Jan Tyl. Their collaboration initially resulted in the project *Digitální filosof* (Digital philosopher, 2019) in collaboration with students of new media studies at the Faculty of Arts, who built training corpora from the works of philosophers. The project enables the users to conduct a fictional interview with one of the following philosophers: Hannah Arendt, Michel Foucault, Gilles Deleuze, Félix Guattari, Peter Singer, Václav Havel, or Tomáš Sedláček. A follow-up project, where one can listen to the results of the generated genre works translated from English and voiced by actors, is available on Czech Radio in a series of podcasts called *Digitální spisovatel* (Digital writer, 2020). In the sequel series, *Digitální spisovatel 2* (2021), Malečková and Tyl applied

a different strategy: it is a project based on the principle of so-called assisted creativity – selected literary authors were asked to write a short story with the assistance of a neural network.

The TheAItre theatre-programming project resulted in the writing and production of a theater play called *AI: Když robot píše hru* (AI: When a robot writes a play), which premiered on 26 February 2021 (as a tribute to the centenary of Karel Čapek's *R.U.R.*). Since the text of the play was created using the GPT-2 model in English and its final Czech form was based on machine translation (researchers from the Faculty of Mathematics and Physics at Charles University who co-authored the project and generated the text have been developing their own machine translation model[9]), they used a generic model.

In the year 2020, the author duo consisting of the programmer Ľubomír Panák and the poet Zuzana Husárová collaborated on a GPT-2 project named Liza Gennart, whose Slovak poems were published in book format in 2020 as *Výsledky vzniku* (Outcomes of origin). Contrary to the previous examples, Liza Gennart was a task-specific model, as the original GPT-2 model was fine-tuned using a Slovak literary corpus (more than 2,000 works consisting of contemporary poetic books, feminist books, issues of contemporary journals, older poetry books available from online archives).

The Slovak artist Samuel Szabó's project Umelá neinteligencia (Artificial non-intelligence) was published in 2020 as a book called *Svet sa nám nestal* (The world has not happened to us). These texts also formed the basis of musical compositions published on a website. Szabó worked with the RNN model, which he subversively trained on folk texts, Facebook posts, geographical names, etc. to parody ideology and nationalism. This was, like Liza Gennart, also a case of a task-specific model.

RECEPTION OF TEXTS GENERATED BY NEURAL NETWORKS

The fundamental difference between the reception of generative and non-generative literature was formulated by Jean-Pierre Balpe in 2005, in his article "Principles and Processes of Generative Literature. Questions to Literature". At the time he understandably perceived the notion of generative literature differently, lacking any experience with sophisticated and successful technologies such as GPT-2 or GPT-3. He was unable to confront his theoretical assumptions with concrete receptive metatexts, since computer-generated texts were still in an experimental phase at the time, not reflected by the wider literary community. Today, we have this opportunity, and so our considerations of the specific mode of reading of this kind of literature can start with an analysis of the metatexts.

In the receptive metatexts thematizing and evaluating the aforementioned Czech and Slovak generative projects, two basic strategies can be identified: 1. a description of the generation process and a generalizing reflection on the fate of literature in the era of artificial intelligence; 2. a reflection on the process of reading the generated text and an attempt to take an evaluative stance on its literary quality.

The first of these strategies clearly dominates quantitatively; often the whole text of the review is built on this principle, in fewer cases both strategies are combined on the surface of one metatext. A prominent rhetorical figure within this strategy is

the expression of concern that writers will be replaced by artificial intelligence. This creates a spectacular emotional arc, as it is regularly followed by reassurance – often backed up by statements from the writers themselves – that an artificial neural network is likely to be a tool to help writers rather than compete with them.[10] This apocalyptic mode of reception is well evident, for example, in the title of a review describing the *Digitální spisovatel* project: "Konec spisovatelů v Čechách. Povídky už umí psát i umělá inteligence" (The end of writers in the Czech Republic. Even artificial intelligence can write short stories). The reviewer makes do with the mere fact that the originator of the texts in question is supposedly a machine, and makes no mention of the linguistic or literary quality of the stories (cf. ajez 2020). However, this emphasis on aspects of technology and values is not relegated solely to the domain of ordinary and relatively ill-informed journalism, but can also dominate theoretical texts. In these types of literary metatexts, poetry is not presented as an aesthetic object, but rather as a stimulus for extra-literary reflection. And in some cases, it is even fiercely critical, such as in an article published on the website of the journal *Science*, reporting on the play *AI: Když robot píše hru*, which questions the very notion of "artificial intelligence", or rather its use in connection with the writing of the play. According to the quoted expert, contemporary text generation technology is not nearly good enough yet to receive such attribution: "Because the computer didn't come up with the whole script itself, DeChant says he wouldn't call the play 'AI created'" (Moutinho 2021).

The latter strategy, based on a reflection of the reading process itself, is much more sensitive to the literariness of the texts under consideration, although it also acknowledges the technological context of their production. In the case of *AI: Když robot píše hru*, or rather its production, several of the published responses (especially in the foreign press) had the character of a classic theater review, and the only technological question that their authors asked was the basic one: whether a robot can write a play. The answers were negative. Jana Machalická's theater review in *Lidové noviny* (2021) is also based on this reception strategy, focused primarily on the artistic, not technological, aspect of the generative work. The reviewer finds an "existential urgency" in the play and takes it as a stimulus for metatheatrical reflection on the development of "postdramatic theatre". Thus, here too the reception tends to a more general reflection, but does not escape from the world of art. The reviewer clearly approaches the communication set-up and perceives the technical imperfections of the generated text as manifestations of the Theatre of the Absurd or as a specific form of humor.

This literary and artistically sensitive reception strategy is, however, mainly connected to the principle of the aforementioned communication game. Some reviewers even explicitly mention the notion of a game in their texts. For example, as Jan Škrob states in his review of *Výsledky vzniku*: "Where the robotic poet Liza Gennart, for example, encounters certain limits – in the occasional repetition or cycling of words and phrases, or perhaps in the alternation of first-person grammatical gender even within a single poem – this could be read as authorial intent and a distinctive authorial style. Personally, I am in favor of this interpretation in Liza Gennart's work as well,

though of course somewhat within the framework of a game. [...] When reading, one misses to some extent the feeling that usually strikes one when reading good poetry – that one is somehow encountering the inner world of another person, even if distant in space and time. Personally, I believe that this is what gives poetry a significant part of its power, apart from the quality and themes of the texts themselves. In Liza Gennart's poetry, this is inherently lacking, unless one accepts her game. The whole project is necessarily a game" (2020).

Ivana Hostová, in her review of the same book, speaks of a "paranoid game": "To read Liza Gennart's speech is to appear in a paranoid game in which we ask ourselves to what extent reading any text is merely a projection of our own expectations of a sensory constant, and to what extent the text really is, operates, has contours, and inserts into us contents that were unknown, unknowable to us before we came into contact with it" (2021). This playful aspect of the reading (although the author does not explicitly mention it) is also evident in Daniel Hevier's review of the same collection, expressing his thought that this type of poetry cannot be read "neutrally": "And even if we consciously try to do so, in the background of what we (re)read, there will always be a noise of suspicion or knowledge that something is not right" (2020). Attesting to the fact that, as a reader, he had to somehow direct or model his reading, Hevier believes that this is due to the otherness of the generated texts, which are inherently subversive insofar as they disrupt "order", that is, our conventional idea of what lyric poetry should look like. In her article "Niekoľko poznámok k recepcii poézie umelých neurónových sietí" (Some remarks on the reception of poetry by artificial neural networks), Ľubica Schmarcová writes about the placebo effect, which is actually a metaphorical expression of the aforementioned principle of playfulness: "we hold a poetry book in our hands, we assume that it is poetry, and the imagination interprets the meaning from what we read, constructs a poem. This can be seen as a metaphor for the homeopathic principle – the active substance we think of, which we believe to be the instrument of cure, is not found in the remedy given, yet it works – as contemporary neuroscience clearly confirms" (2020, 654). The principle of this reception strategy accepts insufficiency or imperfection of the generated text. In such a situation, the reader tends to make sense of this deficiency as an intentional aspect of the work or as a specific quality.

In many receptive metatexts of neural network literature, the two reading strategies mentioned are combined. These are, however, rarely found in a balanced state. One such example is Martin Makar's review of *Výsledky vzniku* (2021). Here the reviewer struggles with the in-between state of attempting to read Liza's verse as ordinary, existentially based poetry, and the tendency to measure her statements against the reality of machine origin – as if he were in a polemic with his own reading. He reflects on his reading with amazement at the machine's skill, and tries to suppress the knowledge of these metatextually based layers. Part of this reading strategy, then, involves a certain awareness of the stratified nature of reading, that is, the fact that reading has different layers, none of which can be completely suppressed or eliminated, although the dominance of attention can be shifted to give priority to a selected layer while not losing sight of the others. Reading thus appears here as a stratification process.

TYPOLOGY OF READINGS OF NEURAL NETWORK LITERATURE

This finding moves us towards a certain schematization or typologization of reading associated with the reception of literature generated by artificial neural networks. From the above analytical probes, we can abstract two general types of reading applied to this kind of generative literature: reading of artificiality and literary metareading.

1. Reading of artificiality

The reader focuses only on the technical aspect of the generative process, she does not perceive the generated texts as literary texts, she only judges the success or failure of the deployed technology. She does not engage in the game of intra-textual subjects, but on the contrary perceives the texts in a desubjectivized way as mere technical products that can testify to man and human culture at most as a specific form of statistics.

2. Literary metareading

This type of reading represents a much more complex and intricate receptive activity (which is why there are disproportionately fewer reports on it than on the reading of artificiality). Its definition will thus be structured into several points that describe different aspects of the literary metareading of generative texts: stratification, intentionality, mimicry, metahability.

Stratification. We have already mentioned the tendency towards a stratified reading of generated texts. Basically, the idea is that the reading of a computer-generated text cannot simply be one-layered because its qualities are close to those of humanly produced texts (owing to the advanced state of artificial neural networks). Thus it is comparable to a normal human literary utterance. Seeing that the reception of a text is intrinsically and non-eliminably tied to an understanding of how it was produced, this reception also encompasses an oscillation of the reader's consciousness and concentration between several levels of the text. Specifically, these levels are: technological (which includes the acts leading to the creation of the text) and literary (which includes the poetic qualities of the text and its semantics).

Intentionality. More than elsewhere, generative texts depend on the reader's intentionality, which moves in the stratified space of the multilayered text (or textual formation, taking into account the influence of paratexts) and sometimes accentuates the sphere of genesis (technology), other times the literary sphere (poetics, semantics).

Mimicry. We use the term mimicry, in the meaning of simulation, pretense, or the feigning of another personality, as was proposed by the game theorist Roger Caillois in his book *Man, Play and Games*: "The spectator must lend himself to the illusion without first challenging the décor, mask, or artifice which for a given time he is asked to believe in as more real than reality itself" (1961, 23).[11] The reader chooses between the layers of the text based on her intention, but this does not mean that she completely suppresses the unchosen alternatives. On the contrary, she is aware of them and their technological context, she knows about the inanimate and non-empirical background of the generated text, yet (thanks to the linguistic and stylistic qualities of the text) can agree to play along with the mimicry. This allows her to perceive the generated text in the same mode as a text created by a living author. However, the awareness of the playful nature of such a reception never disappears. The accepta-

tion of mimicry within the reception of generated texts is clearly visible when seen through the lens of intratextual subjects. In this respect, the generated texts (primarily lyric poetry) do not differ fundamentally from ordinary texts: we can identify the lyrical subject (the speaker of the poem) and reconstruct the subject of the work (the image of the fictional originator of the text).[12] This is where information about the real origin of the generated work comes into play. The reader finds herself at a crossroads: she can accept the mimicry and pretend that the fictional identity of the program (e.g. Liza Gennart) is the actual originator of the texts, while still knowing that the real originator has a completely different character. She can therefore agree to the offered mode of reading, which, however, cannot ignore its play-like nature. In an ordinary work, quite naturally, there is a confusion between the subject of the work and the psychophysical authorial subject; the play becomes indistinct, or recedes from the reader's consideration. In the case of a generated work, the playful nature of the reading does not recede from view; it is always present and participates in the creation of meaning. That is why we speak here of metareading. A generated statement cannot be seen as a human statement, but can be read as a full-fledged mimicry. The dimension of real authenticity is absent here, but the dimension of a play on authenticity is not necessarily absent – which is, after all, the modus operandi of many non-generated texts (for which we usually cannot verify the fidelity of authenticity, but only assume it).

Metahability. Within the framework of play-based reception, it is possible to perceive the shortcomings and imperfections resulting from the automatic generation of the text as manifestations of artistic intentionality, even as manifestations (in Zdeněk Mathauser's words) of the highest level of artistic skill, or metahability. Metahability can be seen as the art of inability, that is, when the creative subject no longer strives for absolute virtuosity but abandons the quest for perfection in the interest of authentic expression, letting the work speak through its cracks and imperfections. Mathauser writes: "Metahability is a condition that transforms virtuosity from a state of finished, closed perfection into perfection in statu nascendi: the world now emerges in a state of birth!" (1994, 21) And this is exactly true for generated texts and their literary metareading. There are a number of mistakes in these texts that point to the process of birth/generation. In literary metareading, these imperfections can be made to carry an aesthetic function; in technical reading, on the contrary, such faults can completely annihilate the text in terms of meaning and literary quality. Thus, even a machine error can have a human dimension, even a humanizing one, if it is read as such – within the playful situation of literary metareading. If the generated texts of the future are indeed technically and linguistically perfect, they will be at risk of artistic failure, as the reception game will lack opportunities for identifying elements of metahability.

Mathauser's notion of metahability, or rather his whole triad of notions affecting levels and forms of artistic skill, that is, hability – superhability – metahability, brings us to another level of the reception of neural network literature, namely the reception aimed at their functioning within the system of contemporary literature. Regardless of whether these generative projects are associated with the pursuit of a perfect imi-

tation of human literary expression, or whether they deliberately work with the imperfections generated by the generative process, the result always acts as a subversive agent within the literary system.

This subversive strategy uses appropriative techniques to connect neural network texts with various literary texts. Intentionality, mimicry and metahability could also be applied to a certain degree to some literary works that use appropriative techniques. However, owing to the variety of approaches used by the authors of appropriative techniques, these reading strategies cannot be as uniformly applied as in the process of reading neural network literature.

Projects that strive to achieve a linguistic and stylistic quality comparable to human literary results (hability), or even pursue a vision of future outcomes that surpass the normal level of such results (superhability) – as exemplified by *Digitální spisovatel* – act as a challenge to contemporary literature as a whole. If a machine-produced text easily achieves the average literary quality of commonly published texts, or even aspires to master challenging genre forms at a virtuoso level, its presence undermines these spheres of mediocrity or formal perfectionism and at the same time acts as an appeal to the otherness of human literary production that authors should achieve in the context of machine-produced texts.

No less subversive is the effect of the results of projects that, on the contrary, deliberately and systematically work with the imperfections created during the generation of the text (here, in particular, *Umelá neinteligencia* and *Výsledky vzniku*). Samuel Szabó exploited this subversive potential to the maximum in his project, showing how the infiltration of imperfectly generated text into ordinary literary and non-literary textual practice can be artistically effective. This form of subversion is essentially parodic in nature and subverts established notions of literary norms in a neo-Dadaist manner. The fluctuation of gender in Liza Gennart's texts has a similar effect, with its gender-subversive significance further reinforced by its human authors, who label Liza as a feminist in the blurb of the book.

CONCLUSION

> The presence of machine poems turns the attention anew to other issues of art, in particular to the ability to understand.
> Ján Gavura (2021, 17)

When David (Jhave) Johnston finished his one-year project of generating RNN poems every day and publishing them monthly as books, from May 2017 to May 2018, or, as he called it the "human + A.I. creative symbiosis" named *ReRites*, he asked his eight fellow artists/researchers in the field of digital literature to write short responses to the project. This process of "symbolic agriculture" (Booten 2019, 107), "carving, cooking, massaging, arranging outputs" (Strickland 2019, 99), "tending that which grows from a pseudorandom seed on a rigid trellis" (Montfort 2019, 139), "combing through, growing the form" (Byrne 2019, 126), a project that "magisterially co-cultivates processed poems" (Funkhouser 2019, 131), using a computer that "digests patterns in language" (Johnston 2019, 173) seemed to have provoked a fruitful mixture of contextualizations that reached beyond and above

the "soil" of the presented piece of work: they cultivated it. As with every literary work, the communicative situation resonates in the readers and their ability to grasp and understand the text.

Regarding our aforementioned typology of "reading of artificiality" and "literary metareading", we would like to conclude by proposing the combined term of "literary metareading of artificiality" to describe a situation in which the reader heeds the artificial nature of the text and its contexts (both historical and theoretical) but is still able to understand and appreciate multiple textual layers, authorial intentionality, mimicry, and metahability. Jhave writes that the combination of human creativity and neural networks "empowers and nourishes" (2019, 171). We believe that this can "grow" beyond the creational aspect to also encompass the level of reception.

NOTES

[1] For more on the concepts and examples of poetry as machines (in a metaphorical as well as in a formal sense) in Modernism and Postmodernism, see McHale 2000.

[2] The medieval Catalan author Ramon Llull also used combinatorial circles with words (e.g., *Ars Brevis, Ars compendiosa inveniendi veritatem*), but these fall into the scope of oracles, philosophy or numerology rather than literature.

[3] Unless stated otherwise, all translations from German, Slovak and Czech are by Zuzana Husárová.

[4] For more on the philosophical conceptualization of transmediality, see Tomašovičová 2016, 29–39.

[5] For more on Czech generated poetry, see Piorecký 2017, 66–78.

[6] For more on Slovak generated poetry, see Husárová 2016, 57–77.

[7] We use anthropomorphising expressions (e.g., learning) since they are widely established terms in the contemporary technological discourse. For example, machine learning is a term in the technological discourse of machine learning and natural language processing.

[8] Regarding the examples of RNN-based literary production on the Czech and Slovak cultural scene, see Piorecký and Husárová 2019.

[9] Regarding the concept of translation as "an opportunity to explore the inherent and adherent homeorhetic character of texts", see Hostová 2016; for the object-oriented translation of historical digital literature, see Pisarski 2020.

[10] For example, see the answer to this question posed to the dramaturg of *AI: When a Robot Writes a Play*, David Košťák: "It doesn't look like it yet, but in the future maybe it could work as one of the tools at the author's disposal" (Anonymous 2021).

[11] Caillois uses the term mimicry also in reference to the reader's identification with a novel character (1961, 22).

[12] The terms "lyrical subject" and "subject of the work" are used here in the way proposed by Miroslav Červenka (2003).

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Reception of literature generated by artificial neural networks

Literature by neural networks. Neural networks. GPT-2 model. Generative literature. Artificial poetry. Literary metareading of artificiality.

This article introduces the phenomenon of literature generated by artificial neural networks, with specific examples of texts created in the Czech and Slovak cultural environment. It follows the historical background connected with generative and combinatory poetics and later describes the principles of data processing used by neural networks work; it also presents the parameters of their machine learning. The focus lies on the reception of these artificial texts in the media and in literary studies, leading to the proposition of two reading types specialized for these works: "reading of artificiality" and "literary metareading", while rehabilitating Mathauser's term of "metahability". The study concludes by suggesting "literary metareading of artificiality" as a term that would combine the aforementioned approaches into a new reception of neural network literature.

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