# The creation process of a synthetic textual medium

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**Abstract:**

*The paper presents the contemporary phenomenon of synthetic textual media that write poetry. It describes the several stages of preparation, conceptualization and building of a neural network that generates poetry. The neural network introduced in this article, called Liza Gennart, is the author of the book* Výsledky vzniku *('Outcomes of Origin', 2020) and of several other projects, among them an interactive multimedia installation. The author of this article uses a practice-led research method to write about her own collaborative project that was conducted in collaboration with the programmer Ľubomír Panák.*

### *Introductory gin: This is how it could really start[i]*

> *"From the seventeenth century till now, machines could be animated—given ghostly souls to make them speak or move or to account for their orderly development and mental capacities. Or organisms could be mechanized—reduced to body understood as resource of mind. These machine/organism relationships are obsolete, unnecessary. For us, in imagination and in other practice, machines can be prosthetic devices, intimate components, friendly selves."*

> (Harraway, 1990, p.220)

Donna Harraway's cult paper *A Cyborg Manifesto* or *A Manifesto for Cyborgs* (both titles appeared in the publications) discusses cyborgs from a feminist and socialist point of view rather than from a technological stance, creating a milestone for posthuman feminist theories (see e. g. publications by Rosi Braidotti). Her understanding of a cyborg as a complex blending human, machinic and animal features, provided the potential for moving away from sci-fi clichés into a fluid identity politics of postmodern epistemology that opposes the antagonistic dualisms of Western discourse (like culture/nature, male/female, self/other, civilized/primitive, right/wrong, total/partial etc.). Her article has influenced numerous scholars since its appearance and made a relevant contribution also in literary research. Brian McHale (2000, p. 24) states that "machine composition is always a cyborg, in something like Haraway's (1985) sense: part human, part machine, a human coupled to a machine or incorporating a machine—or vice versa, a machine incorporating a human (Aarseth 1997: 134)". Harraway's proclamation that machines can be prosthetic devices resonates also with Marshall McLuhan's famous statement that media are extensions of man because they each increase the reach of some part of the human: "All media are extensions of some human faculty – psychic or physical" (McLuhan, 1967, p. 26). Harraway's proposition of a prosthetic relationship between human and machine correlates also with contemporary tendencies that postpone the term "assisted creativity" when discussing the works resulting from the neural network generation but still stress the human creative forces in the whole process. This human involvement includes the choice of data for training, their acquisition and preparation in the right format, choosing the right material from the generated outcomes, and the choice of a suitable presentation scheme or medium.

In my paper, I will describe the various stages of preparation, conceptualization and building of a neural network that generates poetry. Here we cannot talk about machines in the physical sense, since neural networks are programmes executed on computers. I will reflect on a collaborative artistic practice between a programmer Ľubomír Panák and myself by incorporating a method of so-called practice-led research. This method, developed by Hazel Smith and Roger T. Dean in their book *Practice-led Research, Research-led Practice in the Creative Arts*, leans on the basic proposition that "creative practice – the training and specialised knowledge that creative practitioners have and the processes they engage in when they are making art – can lead to specialised research insights which can then be generalised and written up as research" (Smith & Dean, 2009, p. 5).

The abovementioned neural network could metaphorically embrace cyberfeminism, generated a book of contemporary Slovak poetry published as *Výsledky vzniku* ('*Outcomes of Origin'*, 2020), created generated poetry for various projects, among them a multimedia projection presented at several festivals and galleries, and we named her Liza Gennart.

***Poetry as language and language as a word,***
***as if one were attributed to a completely different language***

Discussions about creating poetry generated by neural networks between myself and my husband, the programmer and musician Ľubomír Panák, started in 2016, after the Recursive Neural Network model based on generating character by character (char-RNN) was used by Andrej Karpathy for generating poetry in the style of Shakespeare. Karpathy's article *The Unreasonable Effectiveness of Recurrent Neural Networks* from 2015, in which he described this process, served as an introduction to many artists trying text generation, including those in Slovakia.

Ľubomír Panák had already used char-RNN in 2015, in the project *Klingon Poetry Generator*. He trained a neural network on the works of so-called Klingon poetry, which is a visual poetry composed of ASCII characters, similar to ASCII art, and presented it on the proto-social network kyberia.sk. He published the generated Klingon outputs on dedicated profiles on Facebook and Twitter. Some of these RNN-produced examples of Klingon poetry were publicly displayed as a part of the multimedia performance *Borg adaptation of Klingon poetry* (https://vimeo.com/141889531) at the Ha!wangarda festival in Krakow. In this audio-visual performance, the generated poems were visually manipulated by a programme that connected them with music software, so that their typographic form reacted to the live-produced music and basically became their visual companion, in the style of VJing.

However, for our joint project we decided to engage in a game of mimicry, to create a mysterious neural network persona that would have the generated poems attributed to them, and we named her Liza Gennart. Liza being a "diginym" (Gavura, 2021, p. 16) consisting of the consonant initials of our first names, and Gennart, a portmanteau of the abbreviated terms "generative" and "art" (with an additional letter "n" to be a bit less obvious). For a representation of her personality, we decided on a young intellectual woman in her 20s, who is a feminist, perhaps even a cyberfeminist, living in Vienna, of Slovak heritage. To connect the feminist perspective and literature, we presented Liza in her bio as a student of data science and its application in

literature, who is interested in poetic experimentation and feminism. In order to present this project as an identity game, we changed our parental roles: Ľubomír is portrayed as her mother and Zuzana as her father.

In the first wave of learning, we trained her on all the issues of a Slovak gender journal *Glosolália*, using the char-RNN algorithm. This generated results that were far from everyday language use and needed thorough editing (especially since Slovak is a fusional language), even when we wanted to maintain the traces of artificiality. In order to mask the initial often stylistically strange language outcomes, newspeak, and grammatically incorrect structures, we wrote that her writing in the style of écriture feminine disturbs the common androcentric language with various degrees of radicality. The results were first presented in the form of a chatbot at the Novotvar festival in Bratislava in 2016, where the users could chat with Liza through a dedicated Facebook page and she responded to them in poetic verse. Her poems were published in the journal *Glosolália* under the title *Sedem básní z Glosolálie* ('*Seven poems from Glosolália'*, 2018) and in the international artistic digital journal *sync2 no. 19* (2018).

### *The preparation of a relationship that*
### *we can end as something available*

The company Open AI released the Generated Pre-Trained Transformer 2 (GPT-2) language model in 2019. It is a language model trained on around 8 million English webpages of Wikipedia and Reddit, whose learning results looked highly promising. This model is freely available and due to its relatively easy implementation became quite wide-spread for text generating. Another important feature is that it can be fine-tuned. This means that this language model can perform a specific task and it is not bound to English exclusively. Thus, authors can train it on a language different from English. The neural network, trained on English texts, and therefore on English grammatical and syntactic rules, can be additionally fine-tuned to approximate other language structures. Having seen some examples of texts generated by GPT-2, we decided to approach Liza with this language model and fine-tune it on a database of Slovak texts.

Generation using neural networks is not based on a combinatory principle – they do not randomly pick words from a given dictionary, as was the case with early examples of generated literature. In other words, the words from the database are not just randomly transposed into new sentences or verses of another text. Neural networks repeatedly go through the database and try to

learn the language structures of the given text and subsequently approximate it. The network tries to follow the prompted word, phrase or sentence based on the statistics of the probable results, or it can operate also without the prompt. However, they do not know that they work with language, for them the words are just sequences of numbers. Neural network models consist of algorithms that first convert the letters to numbers. This process is called tokenization, which means that text is converted into tokens. There are several approaches as to how to tokenize the text, which differ mostly due to the length of the text unit that is converted into a number (token). These units can be unique words, characters (as in char-RNN case) or so-called subwords. Tokens as subwords are not syllables per se, but parts of words without any morphological coherence. This subword tokenization is used in the GPT text generation pipeline and in other natural language processing and generation models, because it has proved to be the most efficient way of storing the dictionary (providing a relatively small dictionary over a relatively large text). The neural network goes through sequences of these tokens and thus tries to learn the logic of the language.

The first generating results resemble a sentence form, but without any plausible meaning. Gradually they improve the sentence structure and the meaningful context. The authors have to be aware not to overtrain a network, because when one lets it train for too long, it starts to copy the style of the database texts. Therefore, in order to gain original results, the right assessment when the training should end is crucial.


*In the timelessness she realizes the greatest love of silence*
*so that people might imagine, what they might know*

In order to train Liza to write poetry, we needed a sufficiently large database of texts. Programmers often trained neural networks on old publicly available texts that do not fall under copyright. Andrej Karpathy trained a network on Shakespeare; Kane Hsieh trained it on 42 classical English and American poets and produced a poem in the style of each of them in the book *Transformer Poetry* (2019); Afshin Khashe used medieval Persian poetry as a training material; Eddy Wang trained a neural network on Joyce's *Finnigans Wake* in his project *Rendition of Finnegans Wake* (2020). Other programmers' approach was to train a neural network on a variety of sources published on the Internet. This strategy used by Jiří Materna in the generation of poems for his book project *Poezie umělého světa* (2016): he trained a neural network on the poems available on the amateur writing server *Písmák.cz*. The Slovak artist Samuel Szabó trained his neural network

on various sources for different outcomes. He used Facebook comments, Slovak nationalist poetry, the Bible, Christian songs, geographical names, erotic prose, etc. He published the results under the name Umelá neinteligencia, at first online in the form of articles, and later a selection of them in the book *Svet sa nám nestal* (2020). A successful example of using neural network generation is David Jhave Johnston's project *ReRites*, in which he used a poetry corpus consisting of a combination of poetry websites, a repository of pop lyrics, research articles, tech blogs, quotations from science and pop culture as well as previously generated *ReRites* poems. *ReRites* has a dedicated website and the generated poems were released monthly in the form of a book for a period of one year from May 2017 to May 2018; furthermore, a condensed version with the best poems and theoretical essays was published separately as a book. The project was also presented at festivals and in galleries.

Since we had already created the persona of Liza, we wanted her to write in congruence with that persona, therefore her poetry had to be contemporary. I asked the publishers of the most prominent Slovak poetry publishing houses if they would provide us with their texts and explained that the neural network would not appropriate those texts, but would just learn the language based on them – essentially that we needed to create something akin to a digital library that Liza could read. I received positive replies from these poetry publishing houses: Drewo a srd, FACE, Skalná ruža, Dive Buki, Európsky dom poézie, and Ars Poetica. We were also happy to receive a positive answer from the publishing house ASPEKT, which specializes in gender texts in various genres. The chief editors of the Slovak artistic and literary journals *VLNA*, *Glosolália*, and *Vertigo* provided us with digital formats of all their previous issues. To obtain more sources for better training, we topped up the database with freely available books of women poets and of the most important Slovak Romantic poets from the digitized collection Zlatý fond denníka SME. The database consists of 45 GB of data and the training lasted for about 48 hours. During this time, Liza read the whole database 60,000 times. For that we used a free cloud-based computer service that assigns a computer that was not being used by anyone at that time and would otherwise consume energy doing nothing.

*Surprisingly passionate is just her,*
*her understanding in building herself up,*
*an introspective relationship that allows us to use*

*our own boundaries*

We wanted to structure the book conceptually as a poetic representation of another being's acquaintance with our world. Therefore, at first, we decided on dividing the book into four parts: human, epistemological, natural and technological. Each part contains 10 poems that were generated based on an initializing keyword (or a keyphrase in the case of the natural poems). These keywords and keyphrases always form the title. In the human poems, these are titles like Human, Being, Mother, Father, Childhood, Death, and basic human emotions. In the epistemological section, we wanted to address the basic narratological formats that humankind has used to make sense of the world: Myths, Gods, Truth, Holocen, Utopia, as well as employ posthuman terminology: Human Ends, Exodus, Exploration, Expansion, and a basic theoretical framing in the title Paradigms. The keyphrases in the natural section (e.g. Fire and King Choose their own Tools or Ocean as a Lust for Time) were taken from the already generated poems based on simple keywords representing geographical names. The technological titles stand for basic terms connected with neural training, such as, Neural Network, Database, Programme, Server, or I am not a Robot and Technological Slovakia. The last two sections are named miscelánea, consisting of 20 numbered poems that were generated without any keyword, and Metaliza's appendix, non-poetic texts that show that besides poetry Liza also generates some quasi-informative, quasi-curatorial miniatures about literary and artistic fields. In the paratext, I shortly wrote about the generating and editorial processes and mentioned other Slovak examples of electronic poetry.

*My dear, could you find your interests?*

*I am happy they came back*

After finalizing the book, we started thinking about presentational approaches. We wanted to surpass the traditional reading format, especially since Liza produces texts and not sounds. We did not want to employ the over-used text-to-speech synthesizers, since they would just underline the already obvious artificiality without creating any extra estrangement effect. Reader-response criticism stresses the role of the reader and their experience of the text in the construction of textual meaning. We felt that in the texts that were constructed without any intention whatsoever, it seems even more valid to place the meaning in the hands of the readers. This led us to structure presentations of Liza's poems as a platform, where the reading was a collective task assigned to various people who organized or attended that specific event. Thus, the author's voice, which

cannot be pronounced by sounds, was articulated by a collective reader's voice that assigns some hints of meaning just by the articulation itself.

Another approach we undertook was a multimedia installation consisting of generated visual poems accompanied by my reading of them with Autotune effect. These kinetic poems, often parsed into verses, float in a virtual black-and-white 3D space. This performance was presented at several festivals. For an interactive experience, one can visit the website www.lizagennart.me, where the user can click on one of the titles from a circulating oracle and a poem is uncovered, forming a moving 3D environment.

*My little fire was not so free*

*Look at me, look at me*

Liza was invited to textually contribute to several projects, among them an exhibition devoted to the Slovak experimental artist Robert Cyprich, called *Experiment*, conducted at the Tranzit gallery in Bratislava in 2020. The art journal *Fotograf* (No. 38), which contextualizes contemporary art and is published in Czech and English, named its issue according to the title of Liza's poem that was generated for this journal: *Death, when you think about it.* The Slovak civil association of authors LITA chose Liza as an author to create a representative pour féliciter card for this association in 2021. Her poem appeared on the cover of the Czech version of the magazine *Vogue* (No.32), in an issue devoted to new beginnings. Liza became a laureate of the Slovak national poetry prize Zlatá vlna in 2021. Her texts and interactive multimedia format were displayed in an individual gallery exhibition, at the Ernest Zmeták art gallery in Nové Zámky, from November 2022 until January 2023.

*Although in this case, I have become my last probability.*

*This is my personal space.*

*I am in motion, in being, in this world,*

*when the body covers our world*

We did not create Liza Gennart to oppose the human poet or undermine their position. We created her to bring attention to the whole compendium of Slovak poetry and honour it, while at the same time focusing on the reader's reception. This project was interesting for us as a poetic and technological experiment and we did it as a tribute to Slovak poetry, also trying to formally

contribute to the notion of the author. Liza is the author of the text and myself and Ľubomír are authors of Liza, so our authorship can be considered a frame authorship. With an existential poetics that oscillates between metamodernism and naïve documentation of obviousness on one hand and surprising and provocative metaphors, similes, pleonasms and poetic images in general and self-referential metafiction on the other hand, we can consider her style to be something iconoclastic. From the receptive point of view, Liza brought something unfamiliar, a certain "uncanny" feeling, into the Slovak poetic context, which made readers and critics think not only about the position of poetry, but also about the stage of technological progress, the interconnections between readers and a poetic self that is bodyless and self-less but still a prosthetic device of human creativity. Liza does not want anything, does not need anything, her whole existence is based upon our decisions – the choice of data content, the choice of poems, the choice of media and platforms for presentation, and the choice of environment where the poems are situated.

Liza, with her literary and digital or synthetic background, is a materialization of a combination of humanistic and technological fields, and her outputs concretize the contemporary development of "machine learning" in the form of "assisted creativity." However, we must keep in mind that the program is only concerned with finding the probability of the continuation of a numerical sequence, which is then transposed back into language. It is not even aware that it is writing words. Therefore, we definitely do not question the position of the literary author. Liza is a closed system, she does not know about the world and does not know anything that is happening right now. Her only connection with our world is the texts she has read. Thus, any interpretations of the poems that might relate to the current zeitgeist result from the fact that I have chosen those specific poems from a river of other generated texts.

*A space for my imagery,*
*for my imagery related to the state of this world.*
*Space for my voice,*
*for my touch,*
*for my extinction.*
*That is nothing for you*

[i] All the titles are generated by the neural network Liza Gennart in Slovak and translated into English.


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