

Paranoid Transformer: Reading Narrative of Madness as Computational Approach to Creativity

Yana Agafonova
Higher School of Economics,
Saint-Petersburg

Alexey Tikhonov
Yandex,
Berlin

Ivan P. Yamshchikov
Max Planck Institute
for Mathematics in the Sciences,
Leipzig
ivan@yamshchikov.info

Abstract

This paper revisits the receptive theory in context of computational creativity. It presents a case study of a Paranoid Transformer — a fully autonomous text generation engine with raw output that could be read as the narrative of a mad digital persona without any additional human post-filtering. We describe technical details of the generative system, provide examples of output and discuss the impact of receptive theory, chance discovery and simulation of fringe mental state on the understanding of computational creativity.

Introduction

The studies of computational creativity in the field of text generation commonly aim to represent a machine as a creative writer. Although text generation is broadly associated with a creative process, it is based on linguistic rationality and the common sense of the general semantics. In (Yamshchikov et al. 2019), authors demonstrate that if a generative system learns a better representation for such semantics, it tends to perform better in terms of human judgment. However, since averaged opinion could hardly be a beacon for human creativity, is its usage feasible regarding computational creativity?

The psychological perspective on human creativity tends to apply statistics and generalizing metrics to understand its object (Rozin 2001; Yarkoni 2019), so creativity becomes introduced through particular measures, which is epistemologically suicidal for aesthetics. While both creativity and aesthetics depend on judgemental evaluation and individual taste that depends on many aspects (Hickman 2010; Melchionne 2010), the concept of perception has to be taken into account, when talking about computational creativity.

The variable that is often underestimated in the mere act of meaning creation is the reader herself. Although the computational principles are crucial for text generation, the importance of a reading approach to generated narratives is to be revised. What is the role of the reader in the generative computational narrative? This paper tries to address these two fundamental questions presenting an exemplary case study.

The epistemological disproportion between common sense and irrationality of the creative process became the fundamental basis of the research. It encouraged our interest

in reading a generated text as a narrative of madness. Why do we treat machine texts as if they are primitive maxims or well known common knowledge? What if we read them as narratives with the broadest potentiality of meaning like insane notes of asylum patients? Would this approach change the text generation process?

In this paper, we present the Paranoid Transformer, a fully autonomous text generator that is based on a paranoiac-critical system and aims to change the approach to reading generated texts. The critical statement of the project is that the absurd mode of reading and the evaluation of generated texts enhances and changes what we understand under computational creativity. Another critical aspect of the project is that Paranoid Transformer resulting text stream is fully unsupervised. This is a fundamental difference between the Paranoid Transformer and the vast majority of text generation systems presented in the literature that are relying on human post-moderation, i.e., cherry-picking.

Originally, Paranoid Transformer was represented on the National Novel Generation Month contest¹ (NaNoGenMo 2019) as an unsupervised text generator that can create narratives in a specific dark style. The project has resulted in a digital mad writer with a highly contextualized personality, which is of crucial importance for the creative process (Veale 2019).

Related Work

There is a variety of works related to the generation of creative texts like the generation of poems, catchy headlines, conversations, and texts in particular literary genres. Here we would like to discuss a certain gap in the field of creative text generation studies and draw attention to the specific reading approach that can lead to more intriguing results in terms of computational creativity.

The interest in text generation mechanisms is rapidly growing since the arrival of deep learning. There are various angles from which researcher approach text generation. For example, (van Stegeren and Theune 2019) and (Alnajjar, Leppänen, and Toivonen 2019) study generative models that could produce relevant headlines for the news publications. A variety of works study stylization potential of generative models either for prose, see (Jhamtani et al.

¹<https://github.com/NaNoGenMo/2019>

2017), or for poetry, see (Tikhonov and Yamshchikov 2018a; 2018b).

Generative poetry dates back as far as (Wheatley 1965) along with other early generative mechanisms and has various subfields at the moment. Generation of poems could be addressed following specific literary tradition, see (He, Zhou, and Jiang 2012; Yan et al. 2016; Yi, Li, and Sun 2017); could be focused on the generation of topical poetry (Ghazvininejad et al. 2016); could be centered around stylization that targets a certain author (Yamshchikov and Tikhonov 2019) or a genre (Potash, Romanov, and Rumshisky 2015). For a taxonomy of generative poetry techniques, we address the reader to (Lamb, Brown, and Clarke 2017).

The symbolic notation of music could be regarded as a subfield of text generation, and the research of computational potential in this context has an exceptionally long history. To some extent, it holds a designated place in the computational creativity hall of fame. Indeed, at the very start of computer-science Ada Lovelace already entertains a thought that an analytical engine can produce music on its own. (Menabrea and Lovelace 1842) state: "Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent." For an extensive overview of music generation mechanisms, we address the reader to (Briot, Hadjeres, and Pachet 2019).

One has to mention a separate domain related to different aspects of the 'persona' generation. These could include relatively well-posed problems such as the generation of biographies out of the structured data, see (Lebret, Grangier, and Auli 2016), or open-end tasks for the personalization of dialogue agent, dating back to (Weizenbaum 1966). With the rising popularity of chat-bots and the arrival of deep learning, the area of persona-based conversation models (Li et al. 2016) is growing by leaps and bounds. The democratization of generative conversational methods provided by open-source libraries such as (Burtsev et al. 2018; Shiv et al. 2019) fuels further advancements in this field.

However, the majority of text generation approaches are chasing the generation as the significant value of such algorithms, which makes the very concept of computational creativity seem less critical. Another major challenge is the presentation of the algorithms' output. Vast majority of results on natural language generation either do not imply that generated text has any artistic value, or expect certain post-processing of the text to be done by a human supervisor before the text is presented to the actual reader. We believe that the value of computational creativity is to be restored by shifting the researcher's attention from generation to the process of framing the algorithm (Charnley, Pease, and Colton 2012). We show that such shift is possible since the generated output of Paranoid Transformer does not need any additional laborious manual post-processing.

The most reliable framing approaches are dealing with attempts to clarify the algorithm by providing the context, describing the process of generative acts, and making cal-

culations about the generative decisions (Cook et al. 2019). In this paper, we suggest that such an unusual framing approach as the obfuscation of the produced output could be quite profitable in terms of increasing the number of interpretations and enriching the creative potentiality of generated text.

Obfuscated interpretation of the algorithm's output methodologically intersects with the literary theory that deals with the reader as the key figure responsible for the meaning. In this context, we aim to overcome disciplinary borderline and create bisociative knowledge, which develops the fundamentals of computational creativity (Veale and Cardoso 2019). This also goes in line with the ideas of (Ohsawa 2003; Abe 2011) regarding obfuscation as a mode of reading generated texts that the reader either commits voluntarily or is externally motivated to switch gears and perceive generated text in such mode. This commitment implies a chance discovery of potentially rich associations and extensions of possible meaning.

How exactly can literary theory contribute to computational creativity in terms of the text generation mechanisms? As far as the text generation process implies an incremental interaction between neural networks and a human, it inevitably presupposes critical reading of the generated text. This reading brings a lot in the final result and comprehensibility of artificial writing. In Literature studies, the process of meaning creation is broadly discussed by hermeneutical philosophers, who treated the meaning as a developing relationship between the message and the recipient, whose horizons of expectations are constantly changing and enriching the message with new implications (Gadamer 1994; Hirsch 1967).

The importance of reception and its difference from author's intentions was convincingly demonstrated and articulated by the so-called Reader-response theory, a particular branch of the Receptive theory that deals with verbalised receptions. As Stanley Fish, one of the principal authors of the approach, puts it, the meaning does not reside in the text but in the mind of the reader (Fish 1980). Thus, any text may be interpreted differently, depending on the reader's background, which means that even an absurd text could be perceived as meaningful under specific circumstances. The same concept was described by (Eco 1972) as so-called aberrant reading and implied that the difference between intention and interpretation is a fundamental principle of cultural communication. It is often the shift in interpretative paradigm that makes remarkable works of art to be dismissed by most at first like Picasso's *Les Femmes d'Alger* that was not recognized by artistic society and was not exhibited for nine years since it had been created.

One of the most recognizable literary abstractions in terms of creative potentiality is the so-called 'romantic mad poet' whose reputation was historically built on the idea that genius would never be understood (Whitehead 2017). Madness in terms of cultural interpretation is far from its psychiatric meaning and has more in common with the historical concept of a marginalized genius. Mad narrator was chosen as a literary *emploi* for the Paranoid Transformer to extend the interpretative potentiality of the original text that could

be not ideal in formal terms, on the other hand, it could be attributed to an individual with exceptional understanding of the world, which gives more linguistic freedom to this individual for expressing herself and more freedom in interpreting her messages. The anthropomorphization of the algorithm makes the narrative more personal, which is as important as the personality of a recipient in the process of meaning creation (Dennett 2014). The self expression of the Paranoid Transformer is enhanced by introducing a nervous handwriting that amplifies the effect and gives more context for interpretation. In this paper, we show that treating the text generator as a romantic mad poet gives more literary freedom to the algorithm and generally improves the text generation. The philosophical basis of our approach is derived from the idea of creativity as an act of transpassing the borderline between conceptual realms. Thus, the dramatic conflict between computed and creative text could be solved by extending the interpretative horizons.

Model and Experiments

The general idea behind the Paranoid Transformer project is to build a 'paranoid' system based on two neural networks. The first network (Paranoid Writer) is a GPT-based (Radford et al. 2019) tuned conditional language model, and the second one (Critic subsystem) uses a BERT-based classifier (Devlin et al. 2019) that works as a filtering subsystem. The critic selects the 'best' texts from the generated stream of texts that Paranoid Writer produces and filters the ones that it deems to be useless. Finally, an existing handwriting synthesis neural network implementation is applied to generate a nervous handwritten diary where a degree of shakiness depends on the sentiment strength of a given sentence. This final touch further immerses the reader into the critical process and enhances the personal interaction of the reader with the final text. Shaky handwriting frames the reader and, by design, sends her on the quest for meaning.

Generator Subsystem

The first network, Paranoid Writer, uses an OpenAI GPT (Radford et al. 2019) architecture implementation by huggingface². We used a publicly available model that was already pre-trained on a huge fiction BooksCorpus dataset with approximately 10K books with 1B words.

The pre-trained model was fine-tuned on several additional handcrafted text corpora, which altogether comprised approximately 50Mb of text for fine-tuning. These texts included:

- a collection of Crypto Texts (Crypto Anarchist Manifesto, Cyphernomicon, etc.);
- a collection of fiction books from such cyberpunk authors as Dick, Gibson, and others;
- non-cyberpunk authors with particular affinity to fringe mental prose, for example, Kafka and Rumi;
- transcripts and subtitles from some cyberpunk movies and series such as *Bladerunner*;

²<https://github.com/huggingface/transformers>

- several thousands of quotes and fortune cookie messages collected from different sources.

During the fine-tuning phase, we have used special labels for conditional training of the model:

- QUOTE for any short quote or fortune, LONG for others;
- CYBER for cyber-themed texts and OTHER for others.

Each text got two labels, for example, it was LONG+CYBER for Cyphernomicon, LONG+OTHER for Kafka, and QUOTE+OTHER for fortune cookie messages. Note, there were almost no texts labeled as QUOTE+CYBER, just a few nerd jokes. The idea of such conditioning and the choice of texts for fine-tuning was rooted in the principle of reading a madness narrative discussed above. The obfuscation principle manifests itself in the fine-tuning on the short aphoristic quotes and ambivalent fortune cookies. It aims to enhance the motivation of the reader and to give her additional interpretative freedom. Instrumentally the choice of the texts was based on two fundamental motivations: we wanted to simulate a particular fringe mental state, and we also were specifically aiming into short diary-like texts to be generated in the end. It is well known that modern state-of-the-art generative models are not able to support longer narratives yet can generate several consecutive sentences that are connected with one general topic. QUOTE/LONG label allowed us to control the model and to target shorter texts during the generation. Such short ambivalent texts could subjectively be more intense. At the same time, inclusion of longer texts in the fine-tuning phase allowed us to shift the vocabulary of the modal even further toward a desirable 'paranoid' state. We also were aiming into some proxy of 'self-reflection' that would be addressed as a topic in the resulting 'diary' of the paranoid transformer. To push the model in this direction, we introduced cyber-themed texts. As a result of these two choices, in generation mode, the model was to generate only QUOTE+CYBER texts. The raw results were already promising enough:

```
let painting melt away every other
shred of reason and pain, just lew
the paint to move thoughts away from
blizzes in death. let it dry out,
and turn to cosmic delights, to laugh
on the big charms and saxophones and
fudatron steames of the sales titanium.
we are god's friends, the golden hands
on the shoulders of our fears. do
you knock my cleaning table over? i
snap awake at some dawn. the patrons
researching the blues instructor's
theories around me, then give me a
glass of jim beam. boom!
```

However, this was not close enough to any sort of creative process. Our paranoid writer had graphomania too. To amend this mishap and improve the resulting quality of the texts, we wanted to incorporate additional automated filtering.

Heuristic Filters

As a part of the final system, we have implemented heuristic filtering procedures alongside with a critic subsystem.

The heuristic filters were as follows:

- reject the creation of new, non-existing words;
- reject phrases with two unconnected verbs in a row;
- reject phrases with several duplicating words;
- reject phrases with no punctuation or with too many punctuation marks.

The application of this script cut the initial text flow into a subsequence of valid chunks filtering the pieces that could not pass the filter. Here are several examples of such chunks after heuristic filtering:

```
a slave has no more say in his
language but he has to speak out!
the doll has a variety of languages,
so its feelings have to fill up some
time of the day - to - day journals.
the doll is used only when he remains
private. and it is always effective.
leave him with his monk - like body.
a little of technique on can be
helpful.
```

To further filter the stream of such texts, we implemented a critic subsystem.

Critic subsystem

We have manually labeled 1 000 of generated chunks with binary labels GOOD/BAD. We marked a chunk as BAD in case it was grammatically incorrect or just too dull or too stupid. The labeling was profoundly subjective. We marked more disturbing and aphoristic chunks as GOOD, pushing the model even further into the desirable fringe state of paranoia simulation. Using these binary labels, we have fine-tuned a pre-trained publicly available BERT classifier³ to predict the label of any given chunk.

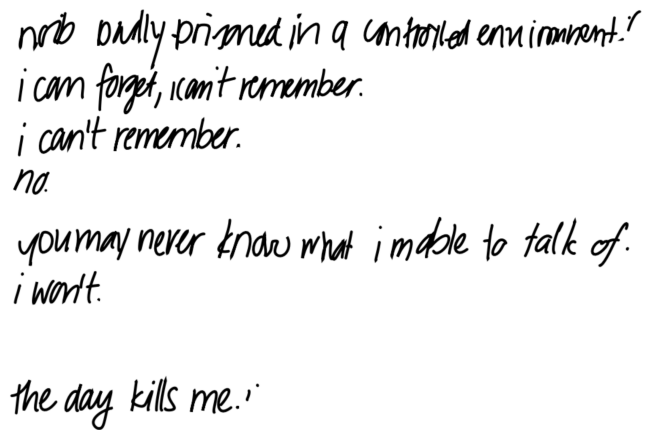
Finally, a pipeline that included the Generator subsystem, the heuristic filters, and the Critic subsystem produced the final results:

```
a sudden feeling of austin lemons, a
gentle stab of disgust. i'm what i'm
humans whirl in night and distance.
we shall never suffer this. if the
human race came along tomorrow, none
of us would be as wise as they already
would have been. there is a beginning
and an end.
```

```
both of our grandparents and brothers
are overdue. he either can not agree
or he can look for someone to blame for
his death.
```

```
he has reappeared from the world of
revenge, revenge, separation, hatred.
```

³<https://github.com/huggingface/transformers#model-architectures>



*no one bodily imprisoned in a controlled environment.
i can forget, i can't remember.
i can't remember.
no.
you may never know what i'm able to talk of.
i won't.

the day kills me.'*

Figure 1: Some examples of Paranoid Transformer diary entries. Three entries of varying length.

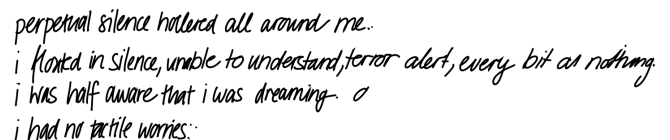
```
he has ceased all who have offended
him.
and i don't want the truth. not for
an hour.
```

The resulting generated texts were already thought-provoking and allowed reading a narrative of madness, but we wanted to enhance this experience and make it more immersive for the reader.

Nervous Handwriting

In order to enhance the personal aspect of the artificial paranoid author, we have implemented an additional generative element. Using implementation⁴ for handwriting synthesis from (Graves 2013), we have generated handwritten versions of the generated texts. Bias parameter was used to make the handwriting shakier if the generated text's sentiment was stringer. Figures 1–3 show several final examples of the Paranoid Transformer diary entries.

Figure 1 demonstrates that the length of the entries can differ from several consecutive sentences that convey a longer line of reasoning to a short, abrupt four-words note.



*perpetual silence hollered all around me..
i floated in silence, unable to understand, terror alert, every bit as nothing.
i was half aware that i was dreaming. o
i had no tactile worries.*

Figure 2: Some examples of Paranoid Transformer diary entries. Longer entry proxying 'self-reflection' and personalized fringe mental state experience.

Figure 2 illustrates typical entry of 'self-reflection'. The text explores the narrative of dream and could be paralleled with a description of an out-of-body experience (Blanke et al. 2004) generated by the predominantly out-of-body entity.

⁴<https://github.com/sjvasquez/handwriting-synthesis>

*i hope to see the disaster firsthand.
i hope that they will be better than what we have done before.*

*this doesn't feel like life anymore.
he's living in a country full of total strangers.*

Figure 3: Some examples of Paranoid Transformer diary entries. Typical entries with destructive and ostracised motives.

Figure 3 illustrates typical entries with destructive and ostracised motives. This is an exciting side-result of the model that we did not expect. The motive of loneliness is recurring in the Paranoid Transformer diaries.

It is important to emphasize that the resulting stream of the generated output is available online⁵. No human post-processing of output is performed.

Discussion

In Dostoevsky's "Notes from the Underground" there is a striking idea about madness as a source of creativity and computational explanation as a killer of artistic magic: "We sometimes choose absolute nonsense because in our foolishness we see in that nonsense the easiest means for attaining a supposed advantage. But when all that is explained and worked out on paper (which is perfectly possible, for it is contemptible and senseless to suppose that some laws of nature man will never understand), then certainly so-called desires will no longer exist." (Dostoevsky 1984) Paranoid Transformer brings forward an important question about the limitations of the computational approach of creative intelligence, either it belongs to a human or algorithm. This case demonstrates that creative potentiality and generation efficiency could be considerably influenced by such poorly controlled methods as obfuscated supervision and loose interpretation of the generated text.

Creative text generation studies inevitably strive to reveal fundamental cognitive structures that can explain the creative thinking of a human. The suggested framing approach to machine narrative as a narrative of madness brings forward some crucial questions about the nature of creativity and the research perspective on it. In this section, we are going to discuss the notion of creativity that emerges from the results of our studying and reflect on the framing of the text generation algorithm.

What does creativity in terms of text generation mean? Is it a cognitive production of novelty or rather generation of unexplicable meaning? Can we identify any difference in treating human and machine creativity?

In his groundbreaking work (Turing 1950) pinpoints several crucial aspects of intelligence. He states: "If the meaning of the words "machine" and "think" are to be found by

⁵https://github.com/altsoph/paranoid_transformer

examining how they are commonly used it is difficult to escape the conclusion that the meaning and the answer to the question, "Can machines think?" is to be sought in a statistical survey such as a Gallup poll." This starting argument turned out to be prophetic. It pinpoints the profound challenge for the generative models that use statistical learning principles. Indeed, if creativity is something on the fringe, on the tails of the distribution of outcomes, then it is hard to expect a model that is fitted on the center of distribution to behave in a way that could be subjectively perceived as a creative one. Paranoid Transformer is a result of a conscious attempt to push the model towards a fringe state of proximal madness. This case study serves as a clear illustration that creativity is ontologically opposed to the results of the "Gallup poll."

Another question that raises discussion around computational creativity deals with a highly speculative notion of self within a generative algorithm. Does a mechanical writer have a notion of self-expression? Considering a wide range of theories of the self (carefully summarized in (Jamwal 2019)), a creative AI generator triggers a new philosophical perspective on this question. As any human self, an artificial self does not develop independently. By following John Locke's understanding of self as based on memory (Locke 1860), Paranoid Transformer builds itself on memorising the interactive experience with a human, furthermore, it emotionally inherits to its supervising readers who labelled the training dataset of the supervision system. On the other hand, Figure 4 clearly shows the impact of crypto-anarchic philosophy on the Paranoid Transformers' notion of self. One can easily interpret the paranoiac utterance of the generator as a doubt about reading and processing unbiased literature.

copyrighted protein fiction may be deemed speculative propaganda.

Figure 4: "Copyrighted protein fiction may be deemed speculative propaganda," – the authors are tempted to proclaim this diary entry the motto of Paranoid Transformer.

According to the cognitive science approach, the construction of self could be revealed in narratives about particular aspects of self (Dennett 2014). In the case of Paranoid Transformer, both visual and verbal self-representation result in nervous and mad narratives that are further enhanced by the reader.

Regarding the problem of framing the study on creative text generators, we cannot avoid the question concerning the novelty of the generated results. Does Paranoid Transformer demonstrate a new result that is different from others in the context of computational creativity? First of all, we can use external validation. At the moment, the Paranoid Transformer' book of is prepared to come out of print. Secondly, and probably more importantly here, we can indicate the novelty of the conceptual framing of the study. Since the design and conceptual situatedness influence the novelty of the study (Perišić, Štorga, and Gero 2019), we claim that the

suggested conceptual extension of perceptive horizons of interaction with generative algorithm can solely advocate the novelty of the result.

An important question that deals with framing of the text generation results engages the discussion about the possibility of a chance discovery. In (Ohsawa 2003) lays out three crucial three keys for chance discovery, namely, communication, context shifting, and data mining. (Abe 2011) further enhances these ideas addressing the issue of curation and claiming that a curation is a form of communication. The Paranoid Transformer is a clear case study that is rooted in Ohsawa's three aspects of chance discovery. Data mining is represented with a choice of data for fine-tuning and the process of fine-tuning itself. Communication is interpreted under Abe's broader notion of curation as a form of communication. Context shift manifests itself thought the reading the narrative of madness that invests the reader with interpretative freedom and motivates her to pursue the meaning in her own mind though simple, immersive visualization of the systems' fringe 'mental state'.

Conclusion

This paper presents a case study of a Paranoid Transformer. It claims that framing the machine-generated narrative as a narrative of madness can intensify the personal experience of the reader. We explicitly address three critical aspects of chance discovery and claim that the resulting system could be perceived as a digital persona in a fringe mental state. The crucial aspect of this perception is the reader, who is motivated to invest meaning into the resulting generative texts. This motivation is built upon several pillars: a challenging visual form, that focuses the reader on the text; obfuscation, that opens the resulting text to broader interpretations; and the implicit narrative of madness, that is achieved with the curation of the dataset for the fine-tuning of the model. Thus we intersect the understanding of computational creativity with the fundamental ideas of receptive theory.

References

Abe, A. 2011. Curation and communication in chance discovery. In *Proc. of 6th International Workshop on Chance Discovery (IWCD6) in IJCAI*.

Alnajjar, K.; Leppänen, L.; and Toivonen, H. 2019. No time like the present: Methods for generating colourful and factual multilingual news headlines. In *The 10th International Conference on Computational Creativity*, 258–265. Association for Computational Creativity.

Blanke, O.; Landis, T.; Spinelli, L.; and Seeck, M. 2004. Out-of-body experience and autoscopia of neurological origin. *Brain* 127(2):243–258.

Briot, J.-P.; Hadjeres, G.; and Pachet, F. 2019. *Deep learning techniques for music generation*, volume 10. Springer.

Burtsev, M.; Seliverstov, A.; Airapetyan, R.; Arkhipov, M.; Baymurzina, D.; Bushkov, N.; Gureenkova, O.; Khakhulin, T.; Kuratov, Y.; Kuznetsov, D.; et al. 2018. Deeppavlov: Open-source library for dialogue systems. In *Proceedings of ACL 2018, System Demonstrations*, 122–127.

Charnley, J. W.; Pease, A.; and Colton, S. 2012. On the notion of framing in computational creativity. In *Proceedings of the 3rd International Conference on Computational Creativity*, 77–81.

Cook, M.; Colton, S.; Pease, A.; and Llano, M. T. 2019. Framing in computational creativity—a survey and taxonomy. In *Proceedings of the 10th International Conference on Computational Creativity*, 156–163.

Dennett, D. C. 2014. The self as the center of narrative gravity. In *Self and consciousness*. Psychology Press. 111–123.

Devlin, J.; Chang, M.-W.; Lee, K.; and Toutanova, K. 2019. Bert: Pre-training of deep bidirectional transformers for language understanding. In *Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long and Short Papers)*, 4171–4186.

Dostoevsky, F. 1984. Zapiski iz podpolya - notes from underground. *Povesti i rasskazy v 2 t 2:287–386*.

Eco, U. 1972. Towards a semiotic inquiry into the television message. *Trans. Paola Splendore. Working Papers in Cultural Studies* 3:103–21.

Fish, S. E. 1980. *Is there a text in this class?: The authority of interpretive communities*. Harvard University Press.

Gadamer, H.-G. 1994. *Literature and philosophy in dialogue: Essays in German literary theory*. SUNY Press.

Ghazvininejad, M.; Shi, X.; Choi, Y.; and Knight, K. 2016. Generating topical poetry. In *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing*, 1183–1191. Association for Computational Linguistics.

Graves, A. 2013. Generating sequences with recurrent neural networks. In *arXiv preprint*.

He, J.; Zhou, M.; and Jiang, L. 2012. Generating chinese classical poems with statistical machine translation models. In *AAAI*.

Hickman, R. 2010. The art instinct: Beauty, pleasure, and human evolution. *International Journal of Art & Design Education* 3(29):349–350.

Hirsch, E. D. 1967. *Validity in interpretation*, volume 260. Yale University Press.

Jamwal, V. 2019. Exploring the notion of self in creative self-expression. In *10th International Conference on Computational Creativity ICCCI9*, 331–335.

Jhamtani, H.; Gangal, V.; Hovy, E.; and Nyberg, E. 2017. Shakespearizing modern language using copy-enriched sequence-to-sequence models. In *Proceedings of the Workshop on Stylistic Variation*, 10 – 19.

Lamb, C.; Brown, Daniel, G.; and Clarke, Charles, L. 2017. A taxonomy of generative poetry techniques. *Journal of Mathematics and the Arts* 11(3):159–179.

Lebret, R.; Grangier, D.; and Auli, M. 2016. Neural text generation from structured data with application to the biography domain. In *Proceedings of the 2016 Conference on*

- Empirical Methods in Natural Language Processing*, 1203–1213.
- Li, J.; Galley, M.; Brockett, C.; Spithourakis, G. P.; Gao, J.; and Dolan, W. B. 2016. A persona-based neural conversation model. *CoRR* abs/1603.06155.
- Locke, J. 1860. *An essay concerning human understanding: and a treatise on the conduct of the understanding*. Hayes & Zell.
- Melchionne, K. 2010. On the old saw” i know nothing about art but i know what i like”. *The Journal of Aesthetics and Art Criticism* 68(2):131–141.
- Menabrea, L. F., and Lovelace, A. 1842. Sketch of the analytical engine invented by charles babbage.
- Ohsawa, Y. 2003. Modeling the process of chance discovery. In *Chance discovery*. Springer. 2–15.
- Perišić, M. M.; Štorga, M.; and Gero, J. 2019. Situated novelty in computational creativity studies. In *10th International Conference on Computational Creativity ICCCI9*, 286–290.
- Potash, P.; Romanov, A.; and Rumshisky, A. 2015. Ghost-writer: Using an lstm for automatic rap lyric generation. In *Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing*, 1919–1924. Association for Computational Linguistics.
- Radford, A.; Wu, J.; Child, R.; Luan, D.; Amodei, D.; and Sutskever, I. 2019. Language models are unsupervised multitask learners. *OpenAI Blog* 1(8):9.
- Rozin, P. 2001. Social psychology and science: Some lessons from solomon asch. *Personality and Social Psychology Review* 5(1):2–14.
- Shiv, V. L.; Quirk, C.; Suri, A.; Gao, X.; Shahid, K.; Govindarajan, N.; Zhang, Y.; Gao, J.; Galley, M.; Brockett, C.; et al. 2019. Microsoft icecaps: An open-source toolkit for conversation modeling. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics: System Demonstrations*, 123–128.
- Tikhonov, A., and Yamshchikov, I. 2018a. Sounds wilde. phonetically extended embeddings for author-stylized poetry generation. In *Proceedings of the Fifteenth Workshop on Computational Research in Phonetics, Phonology, and Morphology*, 117–124.
- Tikhonov, A., and Yamshchikov, I. P. 2018b. Guess who? multilingual approach for the automated generation of author-stylized poetry. In *2018 IEEE Spoken Language Technology Workshop (SLT)*, 787–794. IEEE.
- Turing, A. M. 1950. Computing machinery and intelligence. *Mind* 59(236):433.
- van Stegeren, J., and Theune, M. 2019. Churnalist: Fictional headline generation for context-appropriate flavor text. In *10th International Conference on Computational Creativity*, 65–72. Association for Computational Creativity.
- Veale, T., and Cardoso, F. A. 2019. *Computational Creativity: The Philosophy and Engineering of Autonomously Creative Systems*. Springer.
- Veale, T. 2019. Read me like a book: Lessons in affective, topical and personalized computational creativity. 25–32.
- Weizenbaum, J. 1966. Eliza—a computer program for the study of natural language communication between man and machine. *Communications of the ACM* 9(1):36–45.
- Wheatley, J. 1965. The computer as poet. *Journal of Mathematics and the Arts* 72(1):105.
- Whitehead, J. 2017. *Madness and the Romantic Poet: A Critical History*. Oxford University Press.
- Yamshchikov, I. P., and Tikhonov, A. 2019. Learning Literary Style End-to-end with Artificial Neural Networks. *Advances in Science, Technology and Engineering Systems Journal* 4(6):115–125.
- Yamshchikov, I. P.; Shibaev, V.; Nagaev, A.; Jost, J.; and Tikhonov, A. 2019. Decomposing textual information for style transfer. In *Proceedings of the 3rd Workshop on Neural Generation and Translation*, 128–137.
- Yan, R.; Li, C.-T.; Hu, X.; and Zhang, M. 2016. Chinese couplet generation with neural network structures. In *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics*, 2347 – 2357.
- Yarkoni, T. 2019. The generalizability crisis.
- Yi, X.; Li, R.; and Sun, M. 2017. Generating chinese classical poems with rnn encoder-decoder. In *Chinese Computational Linguistics and Natural Language Processing Based on Naturally Annotated Big Data*, 211–223.