Procedural Generation for Divination and Inspiration

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This paper presents a series of experiments that map the expressive space of specific procedural generation techniques with playful aleatory interventions. They are tools for inspiration based on divinatory practices. This paper connects these ancient procedural techniques to contemporary technologies like Twitter bots. We challenge the limits of these technologies in order to playfully explore the role they can play in everyday life. The first experiment, Nostrandomus, remixes ancient prophecies. The second one, Five Sparrows on a Vampire, generates proposals for dining experiences featuring recipes and accompanying eating instructions. The third tool, Haikookies, is a self-help inspired twitter bot that shares fortune cookie-style wisdom in haiku form. The final experiment, Tiphareth, is a set of partially procedurally generated tarot cards. Additionally, Ephemerald, a tool for streamlined Tracery-based [6] procedural content generation is introduced. The takeaway of this paper is that data curation is a fundamental component of working with generative systems. In other words, the human aspect needs to be present in order to create meaningful results.

CCS Concepts: • **Computing methodologies** → *Natural language generation*; **Artificial intelligence**; • **Applied computing** → *Media arts*.

Additional Key Words and Phrases: procedural content generation, text generation, design, inspiration, cooking, divination

1 INTRODUCTION

Over the last year the authors of this paper have conducted a number of experiments in procedural text and image generation that aim to create evocative and stimulating aleatory messages. The key motivation for designing these systems in the specific ways they were was to create relevance for the reader. Unlike the use of procedurally generated text in connection to game mechanics [29], the projects presented here are tools for inspiration and divination intended to become a part of the everyday life of their audience. In order to allow them to become that, avoiding the so-called 10,000 bowls of oatmeal-problem [5], the challenge that procedural content easily becomes very repetitive, was of utmost importance.

The experiments described in this paper are the following: First there is Nostrandomus, a Twitter bot [33] that creates remixes of Nostradamus' quatrains[1]. Then there is Five Sparrows on a Vampire, a recipe cooking and eating instruction bot that named itself. Haikookies is a bot that creates on-demand haiku with fortune cookie-style inspirational quotes. Tiphareth is a set of tarot cards co-created with a GPT-2 language model. Finally, we present Ephemerald, the tool used to make at least parts of all of the above projects. Ephemerald is both, a language extension to Tracery [6], as well as a convenient editor for procedural text generation. All of the presented projects are publicly available, either as Twitter bots or as downloadable files. In most cases, the source code is available too.

The projects described in this paper are more aesthetically than technically motivated. Differences to existing projects are qualitative and not quantitative. Aside from streamlining the process of creating procedural writing systems, there is no process-changing innovation. What is new in the presented projects is simply their progression towards a specific procedural aesthetics. And what this paper delivers is mostly starting points that should help others to create similarly evocative systems and help them integrate them into the lives of people. As researchers of procedural generation, we

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[1]A stanza of four lines.

should, in our opinion, be concerned with the aesthetics of the increasing integration of automated systems into our lives. And we should not only democratise the means but also the literacy of creating with those systems.

The experiments presented in this paper can be understood as the results of a research-through-design process [14] in the sense that they transform the world from its current state to a state preferred by the designer [37]. There is no formal evaluation of the results. The projects presented in this paper are stepping stones on the way to a more poetic or artistic use of new media. The need for inspiration is hard to define as a requirement though, or, to quote Veale: "When creative systems get personal, so too will their audiences, making it difficult to objectively evaluate their outputs."[32] Instead, these projects should inspire to create similar little generators for everyday use[2] and their output can inspire individual acts of creative stimulation if contextualised by the user individually. The innovation is no in the technical aspects of the software, since we were mostly building upon or directly using existing technical solutions. Instead, the innovation lies in the contextualisation and framing of said solutions and the finetuning of parameters. That puts the projects firmly in the domain of Creative Computation, a fact that is further exacerbated by the focus on *presence* in the life of the user. This notion is defined by Cook & Colton [7] as "the impact a computationally creative system has on its environment, and the impact the environment has on that system in return." While the impact on the individual systems is very limited, the environment has a continuous influence on the overall creative process. Just like ANGELINA [8] is a collection of interlocked pieces of software, the tools presented here are to be regarded as a continuum.

2 HISTORY OF ALEATORY METHODS FOR DIVINATION AND INSPIRATION

Aleatory methods have been employed for stimulating creativity for at least hundreds of years. Famous historical examples are Brian Eno's and Peter Schmidt's Oblique Strategies [11] and the Musical Dice Game [21].

Procedural text generation specifically has a long history. George Philipp Harsdörffer (see [35]), a German poet known for his alias "der Spielende" ("the Player/the playing"), experimented with dice and rotary disks, so-called Volvelles [17] for creating anagrams and words. His "Fünffacher Denckring der Teutschen Sprache" ("Five-fold thought ring of the German language") features five rings with syllables and letters written on them that can be rotated to generate German words. According to Harsdörffer it not only can create the whole German language (which is not true, but an interesting design goal) but also all words it creates are to be regarded as correct German, even if they did not exist before [35].

Surrealism, with its intent on unleashing the subconscious, intensively used aleatory strategies to stimulate their writing and production of art [4]. The surrealist artists were thereby mainly influenced by Sigmund Freud's recent advances in psychoanalysis. Andre Breton, the inventor of the term "Surrealism" and author of the Surrealist Manifesto [3], had a rather complicated relationship with Freud [12]. Nevertheless, the quest for finding authenticity untarnished by conscious thought led him to embrace (and misinterpret) techniques like automatic writing. Flanagan [13] provides a great overview of the influence of games and chance on surrealist production. Among other playful works of art, while fleeing from World War II through Europe, a group of surrealists around Breton (René Char, Oscar Dominguez, Victor Brauner, Max Ernst, Jacques Hérold, Wilfredo Lam, André Masson, Benjamin Péret) designed their own Tarot deck[3]. While tarot was and is a card game popular since centuries in Italy, France, Switzerland, and Austria, it is nowadays most famous as a tool for divination.

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[2]My collaborator on some of these projects, Charlene Putney, has for example implemented a name generator for the game her company is working on using Ephemerald.

[3]It is important to note that the Marseille Tarot deck designed by the group of surrealists was an ordinary deck of playing cards for the card game tarot, as evident by the lack of Major Arcana cards that are required for the divination technique. As such it is not an occult device [1]

Divination is an ancient tradition that spans the whole globe. It has been practiced for millenia in various forms, many of which feature principles of randomisation. One of the better studied examples of such practices is the scapulimancy of the Naskapi of North America. The Naskapi Innu practiced the reading of shoulder blades and other bones. The anthropologist Omar Khayyam Moore [23] speculated in 1957, based on reports by Speck [31], that the motivation for these particular rituals was to break the pattern-seeking tendency of the human mind. Reading shoulder blades of animals was necessary since "without the aid of a … randomizing instrument, it is very unlikely that a human being or group would be able to make random choices even if an attempt were made to do so." Moore continues in his argument by stating that there is a direct line from divination to "games of strategy" as described by Neumann and Morgenstern [24]. In general, Moore regards divination practices as a way of de-biasing a process, of taking intention and personal choice out of problem solving behaviour. It is worth noting that Moore's theories have since been scrutinised and criticised to a point where it can no longer be argued that his reading of Speck's initial research has much validity [30]. At the same time, Moore's text points to an interesting conundrum; On one hand, true divination requires the universe to be deterministic (see [10] for a detailed account of the Stoic viewpoint on this aspect as well as Cicero's criticism). On the other hand, divination is supposedly useful because of its indeterministic qualities. Even if the concrete case presented in Moore's work is fabricated, this aspect of divination techniques — the fact that they challenge established thinking patterns — has been an important aspect of many of their applications.

Divination can be seen, for our purposes, as the projection of the past into the future for the purpose of reflection and stimulation, just like the surrealist games of inspiration. As Harsdörffer already put it in 1647:

"Even if the poet aims at bringing new inventions to light, he can find nothing the likes of which had not been already or still is in the world." [18]

Aleatory practices that work with existing bodies of text are ideally suited for this purpose, in that they retain their original context to a certain degree. Reflection (which is based on association) can be a source of inspiration in that it links the personal reality of the reader with the text at hand[4].

3 TOOLS FOR INSPIRATION

Breton and his post-Dadaist colleagues were mostly interested in its non-deterministic effects. In their quest for authenticity, they employed any technique they could find that would tickle their creative nerve. They invented at least a dozen games for this purpose. Brotchie and Gooding [4] give a good overview of their ludic corpus. Broadly speaking, their games were either language games, visual techniques, or experiments in the world. The most famous one is surely Exquisite Corpse, a pass-on game played by a group of players, where one player starts writing, folds the paper over what they have written, and other players continue the sentence, repeating the folding procedure. This requires a fixed sentence structure to be agreed upon beforehand, of course, in order to know what kind of word to write next. At the end of the round, the sentence is read out loud and contemplated. There is also a version of the game where one player draws something on paper and then folds it to cover most of the drawing. They then pass the folded drawing with some bits left in the open to the next player who continues the work. It is clear that the quality of writing and drawing — the input to the system — has an immense influence on the eventual output. The challenge of curating the data is as important as the algorithm the system follows.

Exquisite Corpse is only one example of the rich corpus of games. The ways surrealist games try to stimulate creativity are many, but the most common patterns of randomisation are:

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[4]Interestingly, this is more or less equivalent to Jacques Maritain's definition of poetry: "that intercommunication between the inner being of things and the inner being of the human self which is a kind of divination" [22]

- Triggered and free association (often referred to as "automatism")
- Collaborative creation and directed communication
- A random time, activity, place, or object
- Use of physical principles like gravity or fluid dynamics

Of these categories of aleatory practices, triggered association is the main application in generative tools like Twitter bots [33]. In this sense they are very similar to e.g. writing prompts. Games like AI Dungeon 2 [34] can possibly be regarded as collaborative creation as well as directed communication — in the form of a structured dialogue with a system. There are very few examples of random times, activities, places, or objects that are not used as a trigger for association in generative systems. Five Sparrows on a Vampire (see below) could be regarded as telling its audience to perform random activities with random objects. Gravity and fluid dynamics are often simulated by computers and generally physical principles can be employed to generate landscapes, architecture, and countless other forms of content for video games. One could of course also argue that dice utilise gravity to generate aleatory outcomes[5].

Most of the experiments in this paper were realised using Tracery [6], a tool for generative text creation. Tracery is lightweight and syntactically simple in order to foster adoption by novices and non-programmers. In other words, the tool was designed to democratise access to generative text. Technically, Tracery expands a grammar written in JSON to a generated text. The writer supplies expansion rules and text snippets in a very compact form. A good introduction can be found in [16] and a couple of examples will follow in this paper.

The tools presented in this paper are based on remixing or expanding upon a corpus of text, or a similar textual data collection. All of them formulate a concrete output in predefined situations with the purpose of allowing the user to relate this output to a concrete situation in their life. They achieve what Johnson-Laird attributes to programmes: "they concentrate the mind marvelously; they transform mysticism into information processing, forcing the theorist to make intuitions explicit and to translate vague terminology into concrete proposals..." [19]. The output of these experiments is meant to be a provocation of the rational mind, a stimulation of creative energy, and an inspiration to reflect on the status quo. At the same time, the incoherence found in the output can always be read as ironic lightheartedness, too.

3.1 Nostrandomus

This Twitter bot[6] implemented in Tracery [6] in June 2018 was a very simple first experiment about the arbitrariness of prophecies. To create it, we downloaded 942 poetic quatrains allegedly written by Nostradamus in 1555. Then we deleted all sentences that did not contain the word "will" and cut the remaining sentences into the part before that word and the part after it. After removing duplicates we ended up with 1,543 beginnings of sentences and 1,584 ends. The Twitter bot simply randomly picks a beginning and an end and publishes that as a new prophecy. It posts one tweet every day, and since there are 2,444,112 possible combinations that means it will start repeating itself in the year 8716.

Of course this brute force remix of the original text is often semantically meaningless or syntactically wrong. Also, it ties predictions of the future directly to existing facts. Interestingly, Nostradamus himself intensively used the past to predict the future. 653 of his 942 prophecies contain references to past events. This also means that today they sound extremely old-fashioned. The context has gone missing over time and our frame of reference has changed.

Examples of historically influenced new prophecies that Nostrandomus concocted are:

Through the South and Aquilon they will have greater struggle.

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[5]'alea' is Latin for 'dice'.
[6]Found here: https://twitter.com/nostrandomus

Of the two duels one will cause Bellerophon to die through Proteus;

Far from his land a King will be frustrated.

Of these only the last one still makes sense in the world of today, as there surely is an exiled, frustrated king somewhere. Other examples reference objects that are not in everyday use anymore today:

Three foists will put it to fire and sword, effusion of blood.

He will occupy the Chalice.

Finally, a lot of the created prophecies are purely absurd but maybe have a certain entertainment value:

And the two great ones will have a near bastard.

By night the Rainbow will pass by the sea in infinite numbers.

But his extortions will travel safely through the sky (over) land and seas.

3.1.1 Takeaways. The main takeaways of this first project were firstly the need to create a more complex grammar in order to increase the expressive range of a text generation system. Secondly, the source material used made nearly every generated sentence sound antiquated. While the fact that the context of the historical sources was maintained in the output is interesting, it also reduces the relevance of the output. In other words already the first experiment demonstrated the importance of curation of input.

3.2 Five Sparrows on a Vampire

The second ongoing experiment is another Twitter bot[7] made in Tracery, this time for creating cooking instructions. This bot was created in in January 2019. It creates challenging recipes accompanied by recommendations for how to cook and how to eat the resulting dish. It tweets once a day. Five Sparrows on a Vampire — referred to as "Five Sparrows" from here, for brevity — was created with Charlene Putney, who is a professional writer of video games. Since it also creates titles for the recipes, we gave it the freedom to name itself.

The starting point for the Tracery script is a selection of 16 different skeletons for structures of cooking instructions. The bot picks a random one and combines 36 spices, 28 types of carbs[8], 30 kinds of vegetables, 20 different meat products, 16 distinct dairy products, 16 kinds of fruit and 28 other ingredients in order to arrive at 860,732,928 different recipes. Combined with the auxiliary instructions on how to cook, the recommendations on how to eat, and the titles, this results in a pool of 1.9 x 10^24 possible cooking instructions[9]. We used repetition in order to increase the probability of expansion for specific ingredients and sentence parts.

The main goal for this bot was to combine inspiring instructions with evocative titles in order to push the reader to try something new. We, the authors of this paper, have successfully cooked a number of dishes based on its suggestions, but the quality of the resulting dish (and the dining experience) has very little to do with the concrete source tweets. The heavy lifting necessarily has to be done by the cook.

A surprising amount of research has been done in recipe generation and algorithmic recipe generation. Shidochi et al. [28], Yokoi et al. [36] as well as Nozawa et al. [25] developed different systems for replacing ingredients in recipes. Kazama et al. [20] took a step further and created a system for transforming a recipe from one regional cuisine to

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[7]twitter.com/OnAVampire
[8]Oatmeal is one of the carbs included.
[9]We are aware that this is a very superficial analysis of expressive range but given the focus on provocation of a response in the reader, the actual number of recipes is mostly illustrative.

another. [27] create recipes — or at least ingredient lists — from photos of food. Yet all of these papers concern technical innovations more than aesthetic interventions. Five Sparrows is an attempt at designing a system that integrates procedural generation into everyday life.

The following recipe, that the bot created on 2nd of January 2020, is a good example of a typical tweet by Five Sparrows. It inspired the authors of this paper to cook Mao's Favourite Dish, a classic Chinese recipe, in the version with pork cheeks on that day. We did not eat in the dark, though, and we substituted the peppers with chillies.

The Cheek Cometh

Fry a good, groundbreaking meal with peppers and pork cheeks. Eat in the dark.

Here is an example of a very different recipe format that could lead to an interesting eating experience. The cook has to decide for themselves whether they intentionally burn the dish in order to be able to complete step 4.

Killing Three Crows With A Magpie

1. Dice tomatoes and cabbage.
2. Season with nutmeg and white wine.
3. Throw together a newfangled dish.
4. Ignore the slightly burnt taste.

Here are two variations of the same basic text skeleton that exemplify the variation that is possible even when working with the same sentence structure:

Like Six Hungers And A Tome

First, find chopsticks. Then fry a modest dish with white mushrooms and walnuts, defined by the interplay between the hottest chilies you can find and basil. Get organic ingredients.

Five Tempting Nuns

First, find the oldest knives you have. Then fix a simple, wild meal with slow cooked sausages and white wine. Smell each bite before putting it into your mouth.

3.2.1 Takeaways. The main takeaways from experimenting with the output of Five Sparrows are that the rich body of ingredients that forms the database allows for challenges in real-world replication of the output, but also for delicious and inventive food. While the instructions for how to eat are sometimes more evocative than the cooking recipes, the bot can still provide stimulating input for making decisions on what to cook on most days. At the same time this Twitter bot turns cooking into a puzzle game about how to concoct something delicious out of impossible or very incomplete recipes. Maybe the most important thing we learned is that what is left out – the negative space – also forms a part of the expressive range of this bot.

3.3 Haikookies

In January 2019, the authors of this paper released another Twitter bot[10] with the intention of providing a little bit of self-help and guidance. We started from the observation that some fortune cookies feature life advice that is borderline illegible and, reflecting on what a Tracery grammar is best suited for, we realised that it would be trivial to create a tiny bot that would give barely semantically meaningful but still worthwhile guidance in haiku form.

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[10]https://twitter.com/haikookies

For decades, researchers and artists have created procedural poetry, often with vastly superior systems. The art work that comes closest to this project is Zach Gage's #fortune [15], an iOS app that prints a virtual fortune cookie every day based on modified public tweets.

Other than the bots described previously, Haikookies only replies to inquiries instead of sending scheduled tweets. We created a grammar that combines words into sentences based on their syllable count. The results is a tweet of three lines with 5,7, and 5 syllables respectively. Here is a sample of the grammar in Tracery format that describes actions with three syllables:

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[actions-three]
do much good
shine brightly
never #verb-one#
never #verb-one#
#verb-one# with grace
impress them
falter not
#verb-one# the #noun-one.s#
heed the #noun-one.s#
#verb-one# #noun-two-plur#
#verb-one# #noun-two-plur#
```

The output of this grammar can by definition only be tacky, and is intentionally not easy to parse for the reader. This should stimulate filling the gaps in its meaning with the reader's own thoughts. We also made sure that a lot of the words we use are borderline preposterous in order to simulate the aura of fake millennia old wisdom.

Here are four examples of the output:

Features impress them / The early curse gets the time / Believe in children

Rainbows come and go / He who eats mud loses hope / Remember, dreams fall

Wandering bedsheets / Trial is your ally now / Motherly today

It will draw sparrows / Create with a single rain / Remember, wealths go

3.3.1 Takeaways. What we have learned from making Haikookies is that there is a fine line between being ominous and making no sense. While the juxtapositions that are part of the style of haiku are a perfect feature for procedural generation, a lot of the created poems require a lot of concessions to inspire. Curating the "right" words, ideally those with multiple definitions, creates ambiguity and space for projecting meaning. Making the system only send answers to requests — basically you have to tweet at it to trigger it — means that we can make sure that there is always the intention of the reader to actively frame the answer. On a technical level, this bot required us to write a grammar that is much closer to a description of the English language, due to the syllable counting, than previous bots were.

What can also be seen in this experiment is that the effect of firm structural constraints holds even when poetry is generated. Negative space, created by juxtaposition, is a defining feature of haiku and – similar to the recipes in Five Sparrows (see above) – the arbitrariness of rule expansion in aleatory systems inevitably leads to surprising word sequences.

3.4 Tiphareth

For ProcJam 2019[11], my collaborator Charlene Putney and I created a set of tarot cards[12] using the GPT-2 language model [26] and Tracery. We fine-tuned the 355 million parameter model with Aleister Crowley's Book of Thoth [9] on Google Collaboratory. The workbook was based on Max Woolfe's GPT-2-simple scripts[13]. The Book of Thoth describes how to use Crowley's and Marguerite Frieda Harris' Tarot Deck. The deck deviates from the standard tarot deck in that Crowley renamed some of the cards. The World, for example, became The Universe.
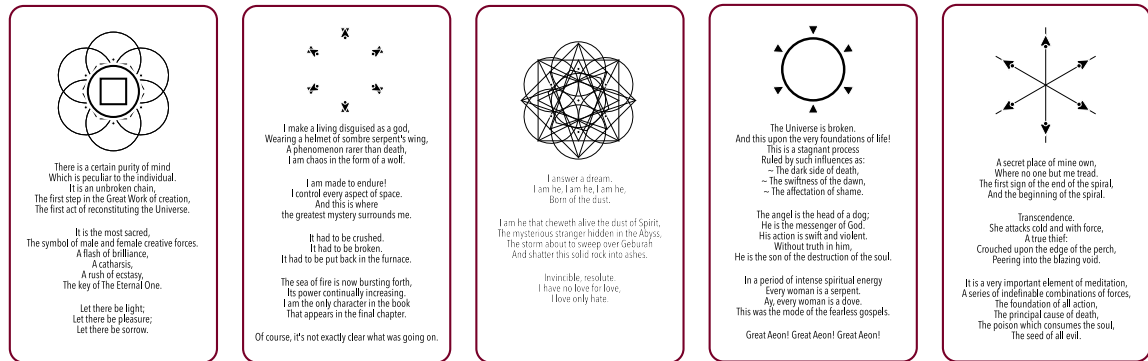

Fig. 1. Five example cards from Tiphareth: The Chariot, The Hanged Man, Death, The Aeon, and Lust

The first step was to clean the page numbers and headings from the book, and remove other distractions, to reduce it to content alone. Then the names of the cards of the Major Arcana — according to the Thoth Tarot deck — were used as preamble and text was created with the following parameters: length 23 and temperature 0.666, length 34 and temperature 0.777, and length 42 and temperature 0.93. Afterwards, using the human pattern recognition machine to craft a small intuitive fragment out of the results, we created the writing on our own cards. As embellishments, we added pseudo-sacred geometry images procedurally generated using Tracery. The fact that SVG is a text format and that Ephemerald can display SVG images makes the combination a perfect fit for procedural generation. Sacred geometry is, due to its highly regular structure, easy to automate too, especially if it's only about creating decoration inspired by it. The cards intentionally do not feature their names in order to force the reader to read and interpret the writing. Figure 1 shows five examples of the resulting tarot cards.

3.4.1 Takeaways. The takeaways of this experiment are that the preparation of the texts before fine-tuning is as important as picking the right parameters, maybe even more so. This is also evident in the many scripts that are run to transform and clean up the data that is used to fine-tune the model behind AI Dungeon 2 [34] or the manual labour described in Boog's article about GPT-2 as a writing partner [2]. We did not have the time during the jam and never revisited the project, but if we ever do so, we will add rules about how to play with the cards. Maybe we should procedurally generate those rules too. Currently the only way we imagined using the cards is to guess which card of the collection corresponds to which card of the Major Arcana.

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[11] http://www.procjam.com
[12] https://alphachar.itch.io/tiphareth
[13] https://github.com/minimaxir/gpt-2-simple

Since this is the only experiment in this series that is not running unsupervised, we could curate the output and pick the best sequences of sentences. Given the limited amount of control that GPT-2 offers, that was a necessity and is a usual way of working with such systems.

3.5 Ephemerald

Ephemerald[14] is an editor for Tracery grammars that expands on the original language and offers a streamlined workflow. It was written in Swift and runs on macOS. Ephemerald's backend[15] is based on Benzi Ahamed's port of Tracery[16] to the Swift programming language. The frontend is a dedicated GUI for editing Tracery grammars. The project was realised in autumn 2018 and launched in January 2019.

The following features set it apart from the original Tracery implementation:

- Custom content selectors and hierarchical tag storage for more sophisticated expansion
- Deterministic execution to create reproducible results
- Addition of a simple language for simpler evaluation of mathematical formulas
- Support for regular expressions that modify the output
- Additional modifiers

The first of these features was already present in the original Swift port of Tracery. The other features were added by the author of this paper. Deterministic evaluation allows the content creator to step back to a previous solution, eliminating the problem where output during the process is lost due to the volatile nature of aleatory systems. The calculation modifier supports basic arithmetic operations sorted by parentheses and a handful of more complex functions like sine, cosine, square root, and random number generation. It is primarily meant for the creation of SVG files, where coordinates often have to be transformed.

Ephemerald introduces a number of new modifiers — Tracery commands that modify the output of the expansion of the rule they are attached to. These are:

- `'.?'`: Probabilistic evaluation — in 50% of the cases the rule gets expanded, otherwise it gets ignored
- `'.t'`: Indenting which makes it possible to procedurally generate Python code or VGDL files
- `'.title'`: Title case conversion

The editor exposes the above functionality and crucially also supports visualising SVG and GraphML. It offers convenience functions like syntax highlighting, autocompletion and a snippet library to speed up development. Deterministic execution means that grammar expansions can be replicated. It offers shortcuts for converting between a compact text format and JSON. The JSON file can be readily used on Cheap Bots Done Quick[17], the most popular platform for Twitter bots.

4 REFLECTION

What we have learned in these projects is a collection of strategies against the problem that procedural generation easily produces irrelevant output [5]. A procedural system has to be carefully designed with that in mind, and — as Emily Short puts it — procedural generation "isn't a substitute for designing content. It's a way of designing content" [29]. With procedural generation, and especially unsupervised Transformer language models, becoming accessible to

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[14]https://martinpi.itch.io/Ephemerald
[15]https://github.com/martinpi/ephemeral
[16]https://github.com/BenziAhamed/Tracery
[17]https://cheapbotsdonequick.com

end users and content creators, we need to think about how to harness their abilities and what role human creators play in creative processes that use such technologies. This paper argues that the human, the designer or artist, should have great influence on the output of the overall system via curation, filtering, and repetition.

For text-based generation, we have learned that curation of the corpus is a major factor in regards to the quality of the output. For GPT-2, the text has to be refined so it is free of irrelevant formatting that often comes with the source material. AI Dungeon 2 [34] demonstrates that a dedicated web crawler that collects text snippets featuring a challenge-response format similar to the expected user input is very helpful.

Additionally, for grammar-based approaches, stochastic aspects like the probability of expansion of a specific sub-tree in a grammar have to be carefully tuned to find the appropriate balance between randomisation and control. Since we are working with texts that have real-world context, e.g. separating ingredients into different types that get added to a meal at specific stages of cooking, the groupings of variations can mimic real-world categories.

In order to inspire the reader to interpret and frame the output, the system has to encourage them to contextualise it in their respective everyday life. A concrete purpose — from cooking to self-help — furthers this aspect. Ambiguity is key in luring the reader to fill the gaps of meaning with their own thoughts.

Evocative writing, accomplished directly by us in the bots we wrote ourselves and indirectly by curating the right source material, is well suited for probabilistic systems. Still, manual curation of output is often necessary to raise the overall output quality. Overall, the way of working with these generative systems requires human aspects in the form of taste and aesthetics to be an integral part of the design process.

5 INDIVIDUAL CONTRIBUTIONS

I have been the sole author of this paper and the sole creator of Ephemerald and Nostrandomus. Charlene Putney has contributed to Five Sparrows. Haikookies and Tiphareth were developed together and both creators contributed about the same amount of work.

6 THANKS

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