THE POETRY GENERATOR

by

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Abstract

Poetry is one of the oldest forms of communication. The poet is interested in finding new ways of expressing universal truths. Science and technology also are looking for new ways to communicate universal truths.

Through the use of the computer and other technologies language can be transformed, so that it can be perceived as well as read.

Thesis Supervisor: Muriel Cooper
Title: Associate Professor of Architecture
THE POETRY GENERATOR

ACKNOWLEDGEMENTS

This system is dedicated to
  Muriel Cooper
  who helped me find a way
  I never thought possible

to Ron MacNeil
  who converted me
to the Binary system

to David Goodstein
  and the members of the
  Visible Language Workshop
  for their continued support

to Emmett Williams
  who encouraged me to
  change my rhythm

  and to my parents...
Unable to communicate
in any language
Unable to communicate
Poetry locked inside
The language of science

Words lost in the layers
of memory
machine code
Unable to communicate
Screen magic
Screen tragic
Perspective lost within
TABLE OF CONTENTS

Introduction 6.
Concrete Poetry 8.
Mathematical Poetry 13.
Text 3 22.
Some Reflections 25.

The System 30.
Some Reactions 33.
Conclusions 40.
Bibliography 43.
Footnotes 45.
INTRODUCTION

Poetry is one of the oldest communication systems known to humanity. Traditionally it has been thought of as VERBAL and written. To break this tradition, a group of poets, sometime after the Second World War, began to free themselves from the boundaries of poetic form and experiment with new ways of treating Poetic Language. These forms became Visual as well as Verbal.

The poet is inherently interested in expressing a thought or conveying information, as concisely and as clearly as possible without damaging the message frame-work. Unlike prose, it encapsulates language and transmits synthesized information into a visual form.

The Verbal/Visual poet is AMBIGUOUS, in that he/she allows for a broad interpretation of the words, and CONCRETE, in that he/she uses the base of a symbolic language or the alphabet.

The computer is a tool designed to help specialized systems to communicate information in an efficient and rapid way. It is capable of handling and storing vast amounts of unrelated data and can change this data and interchange it, instantly, with the proper software.

With the development of new
In this century, we begin to see the need for the accessibility of the artist to more varied kinds of visual and verbal information, in order to begin the transformation of the poetic message. As society becomes more complex, so does the need of the artist, who is interested in manipulation and change in the present human message system.

The Poetry Generator is a complex system, designed to combine easy access abilities of the computer and the needs of the visual poet/artist. To use the computer, the artist must begin to understand the 'internal network' of the machine, in order for it to be used as a tool in the most effective way.
"THE WORD IS DEAD . . .

THE WORD IS IMPOTENT

asthmatic and sentimental poetry

the ' me ' and ' it ' which is still in common use everywhere . . .
is influenced by an individualism fearful of space the dregs of an exhausted era . . .

psychological analysis and clumsy rhetoric have KILLED THE MEANING OF THE WORD . . .

the word must be reconstructed to follow the SOUND as well as the IDEA if old poetry by the dominance of relative and subjective feelings the intrinsic meaning of the word is destroyed we want by all possible means syntax prosody typography arithmetic orthography to give new meaning to the word and new force to expression the duality between prose and poetry can no longer be maintained the duality between form and content can no longer be maintained Thus for modern writer form will have a directly spiritual meaning it will not describe events it will not describe at all but ESCRIBE it will recreate in the word the common meaning of events a constructive unity of form and content . . ."1.

8.
The term "Concrete Poetry" is relatively new. It appeared following the Second World War, on a surprisingly global scale, covering many countries and continents.

The word "Concrete" refers to many different styles of revolutionary poetry. In 1966, an English critic named Mike Weaver, organized the First International Exhibition of Concrete and Kinetic Poetry, in Cambridge.

It is here we begin to see the major categories of the new poetry. 1. visual (perceived through sight) 2. sound 3. kinetic (moving) 4. mathematical (assigning of numerical value to letters).

One could argue that all of these categories are visual, or they have some elements of movement, and somehow interrelate with one intention. But the commonality of all these poetic forms is: ... the concentration upon the physical material from which the poem or text is made.

The key to Concrete Poetry is the reduction of language to its essential elements. There lies the poetic choice. The poet/artist may decide to reform letters, respond to the sound and the rhythm of the word, to fragment or reorder the linguist material and intrinsically place the information in a personal time and space.
Put another way, this means the concrete poet is concerned with making an object to be perceived rather than read.3

To the concrete poet, the old linear structures are no longer valid, and to advance the art form and establish a new way of communication, the words or poem must begin to transform to an active structure.
Example of a Vocal Concrete Poem by PETER GREENHAM
Example of Concrete Poetry from the book SWEETHEARTS
by EMMETT WILLIAMS.
Three variations on Concrete Poetry

AUGUSTO de CAMPOS

LAURENCE KUCRARZ

Map for text of the book
THE VOYAGE

EMMETT WILLIAMS
The spoken, printed and tele-dramatized word becomes a particle of thought energy.

The drawn, photographed, painted, and kinescope-picture becomes more of the same.

All of the devices of locomotion subterranean, surface and aerial equally reduced.

I am at all places in all forms, at all times.

What were books, become word sequences, screen projected then projected, then free floating vibrations which impinged upon my mind as I desired them.

I TRANSFORMED THE WORD AND IN DOING SO I TRANSFORMED MYSELF.4
Example of Mathematical Poetry by BERN PORTER

\[
\frac{\text{for}^r[M-u]}{\text{Comp}^p\text{os}^i\text{t}(\text{io}^n)}
\]
MATHEMATICAL POETRY

To see the parallels between math and poetry, it is important to understand the structure of poetic language. For the purpose of this study, we will concentrate on those components translatable to the computer.

PROSODY is a general term used to describe poetic form. It refers to the science of forms, and includes quantity, accent of syllables, versification, meter and metrical composition. It is from the Greek, meaning a song sung.

PROSODIC NUMBERS are the sum of the numbers assigned to each acoustical level of pitch, force and duration of sound. Perhaps the master on PROSODIC LANGUAGE and NUMBERS is a man named Ernest Robson. He, along with his wife Marion and several other colleagues, developed an orthographic way of writing ENGLISH prosody.

An alphabetical process for cueing readers to speak the three dimensions of sound in speech has been constructed: fundamental frequency, duration, and intensity. A scanning model based on differences in the apparent levels of three dimensions is presented.5

There are other considerations concerning the breakdown of poetic language. SOUND being one of the primary one. Another being RHYTHM, which varies from person to person. Although there are set sylla-
ble stress factors in the Eng-
lish language, such as region-
alism, emphasis, punctuation
all can change the 'beat'
of a word or line. That is
why in a computer poetry
system, there must be levels
of interaction, so each user
is able to introduce his/her
own variables.

A less translatable term is
ALLITERATION, which deals
with the repetition of ini-
tial stress sound, usually
consonants. REPETITION, the
formal re-use of words and/or
lines, REFRAIN, a phrase or
line of verse repeated at in-
tervals, and finally ONOMATO-
POEIA, which describes some-
thing by means of sonic and
rythmical devices, literally
the sound of language.

both the likeness and the con-
trast between science and
imaginative art: each communi-
cates by employing a technique
of ideas not completely describ-
able in terms of sense experi-
ence, but the one labors to make
its communications capable of
identification or correlation
by all individuals, while the
other insists that each indivi-
dual must translate the
original into something
peculiarly of his own creat-
ion.6

The mutual interests of scien-
tist and poets has been pre-
valent for centuries. Poets
have been reaching toward
science to draw their imagery,
and the scientist has looked
toward the verse to romanticize
the complexities of scientific
knowledge.
Along with this mutual interest, there has been a divergence. Plato claimed that "the aims of geometric reasoning and poetry were inherently antithetical". (The Republic)

Perhaps Plato was close to the truth, but there still remain qualities and aims in both science and poetry. LANGUAGE is a group of symbols (written) which have meaning. Mathematics uses number and symbols, which also have meaning (to someone). They both deal with concision, abstraction, symbol making or metaphor, analogical elaboration the connection from chaos to order, associations of varying types of relationships, the notation of hidden truth and messages through the use of the specific symbolic language.

The difficulty for the poet is to analyze the structure, as well as, the meaning and then find a way to express and combine in a new fashion, using the advantages of a system, such as the computer. Perhaps the most translatable component in poetry, is that of sound and stress. How the word figures vocally.
Ernest Robson and his colleagues have developed a mathematical system that assigns values to each stressed syllable according to its position and strength in the word and/or sentence. The prosody of poetry is essentially based on the sound values of the letter. The computer is capable of responding to varying syllables, if each type of function has a value, it then has a visual element.

Another way of dealing with letters mathematically, is to understand the position and value of the letter in terms of the computer and how it can be displayed on the screen. This method involves a greater degree of interaction between the poet and the machine. In Robson's formula, there is a need to program into the memory a vast amount of "functions" or things the computer understands and interprets and the letters would really be responding to each other rather than buffering between poet, word, and computer.
Figure 2.
The graphic cue for reduced vowels or syllables. Although this "schwa" cue is
needed, arithmetically, to specify four stress levels and is a readable cue, speakers
rarely articulate a reduced A-o, T, P—o vowel differently from an A, T, P.
See note under Figure 5 for arithmetical operations that support a value of 1 for
reduced vowels.

Figure 3.
Qualitative associations between numbers of stress levels and numbers of prosodic
levels.

<table>
<thead>
<tr>
<th>Stress Level</th>
<th>Stress Quality</th>
<th>Amp. T P Prosodic Number</th>
<th>Prosodic Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Minimum detectability</td>
<td>0 + 1 = 1</td>
<td>Reduced</td>
</tr>
<tr>
<td>C</td>
<td>Inconspicuous</td>
<td>1 + 1 = 2</td>
<td>Weak</td>
</tr>
<tr>
<td>TEST</td>
<td>Inconspicuous</td>
<td>1 + 2 = 3</td>
<td>Weak</td>
</tr>
<tr>
<td>J</td>
<td>Inconspicuous and prominent</td>
<td>1 + 3 = 4</td>
<td>Between weak and rich</td>
</tr>
<tr>
<td>DANCE</td>
<td>Prominent</td>
<td>2 + 3 = 5</td>
<td>Rich</td>
</tr>
<tr>
<td>C</td>
<td>Prominent</td>
<td>2 + 3 = 7</td>
<td>Rich</td>
</tr>
<tr>
<td>ONE</td>
<td>Most conspicuous</td>
<td>3 + 2 = 5</td>
<td>Powerful</td>
</tr>
<tr>
<td>WLD</td>
<td>Most conspicuous</td>
<td>3 + 3 = 9</td>
<td>Powerful</td>
</tr>
<tr>
<td>B</td>
<td>Most conspicuous</td>
<td>3 + 3 + 3 = 9</td>
<td>Rich and powerful</td>
</tr>
</tbody>
</table>

The Formula for Mathematical Poetry by Ernest Robson.
Examples of Mathematical Poetry

The full of feathers in the fall
Is lulled in surface areas where
I, bears hehush of some numo nimbus layer
Filtering ils dimthistles in the rifts of thmnner
sw mmmg under, drifting by:
Of some inner hesitance among the rumbling
Weadiegsthemselves stilt once again with
the, own ai,,
They b rush the tults of earth with pale
dispersons of the s
Thus snows fresh whiteness
is -rot's airy
phase
O
f
lattice-scttreed light
among
the porticos
ofdawn
Whe dayight wit its somaor flame
And this rs so-wheter heaved mn
wit continuou sited b ssess in ,obilance
suggestmngEvidence of Heaven's hispmng
or lis aira
dimensions in its -liUnglace,
I don't know what to say. I am tired.
TIRED

of the humming of machines. Tired of the

drive

that forces me into realms that confuse the

very

structure of my brain pattern. Around

full circle

again and again. CONFUSION.

Who are these people.
Who do I confront.
I am dizzy with sound.

And fascinated.
With the possibilities
Drunk with the thoughts
of independence of the
very system that makes
me dependent.

March 1980
Joan Shafran
Like any artist trying to understand a new technique or tool, it is important to begin simplistically before approaching the more complex issues. The creation of a new poetry methodology, depends greatly on the understanding of the equipment being used and its capabilities.

To explore the computer and its design possibilities, a series of programs called TEXT, TEXT2, and TEXT3 were designed. These bits of software were put into the memory of a perkin Elmer 3220 Computer which uses a Grinnel Color Display Screen.

Computer jargon gets fairly complex, but it is important to know that the Grinnel displays graphic information in full color by using a series of small squares called PIXELS. So any image is simply many of these squares or pixels put together to form a picture.

Contained within the Grinnel is a type font called GRIN$-TEXT. It has four sizes. By writing software, using this font system, the Text programs were created. TEXT3, the most sophisticated one, allows the user to do a type of CONCRETE Poetry, letter by letter, by using the TABLET and PUCK, which allow for interaction between the artist and the machine.
The Fonts, because they live
the overlay planes, or to
three layers of memory, can
be used in any combination
of the four sizes.

Also because of this they
block out any color that is
underneath them, such as
placing the word over a pic-
ture. Any picture that is in
memory is available to the
user, as well as, a picture
that might be put in by the
artist. (What will become
of the copyright laws?)

After 'bringing up a pic-
ture ' and writing poetry
over it, the color of the
words may be changed by
assigning numerical value to
the color.
Example of Computer Generated Poetry and Imagery
by Joan Shafran
SOME REFLECTIONS
Poetry by Joan Shafran
To Nasa Inventions Waiting for Licensing

The point perspective
of an age Gone by
you would be FATHER
farther into black
of unknown sky

Before the piece be welded
Before the system converts
transparent
cell power

becomes
the phantom beasts
of science fiction

Before

leave the land to us
who inhabits beauties dream
leave the memories
optical

Before

The war is waged
between
beyond the cloud
now covering the sun

Beyond

Beware

When micro monster turns
on you searching
for its own
freedom

26.
Imperfections in Scenario #1

Impressions on a Saturday night
IMpressions

What was I to you
When we last tried to PROVE our point

To one another
Soft light guise
We dance our separate dance
checking out the rhythm

IMPRESSIONS
IMpressions
Top wave analog
elegant only in separate Frames Carefully chosen for Effect

27.
Hung around your space too long
Sat immobile too much time
OUT
a member of a team
no rules
to relate to
no spot
COMFORTABLE

This
is
what I am
in outline Form

With each flicker
of each light
passing 30 times
a second
SCREEN MAGIC
SCREEN TRAGIC
Perspective lost
within the screen

Alternate signals
bit by bit
with each flicker
with each flash

28.
PERSPECTive lost
within the screen
GAME
    on personal film
Same Images
like yesterday
    Stories different
TIME
    you
    play
    it
    back to me
    fill
    I
    in We entertain each other
    the space

29.
the artist being sensitive to impressions from nature and human nature, only acquires his significance for society by communicating his vision through a Pattern of formal structure which his technique can impose upon some selected medium. Whether musical sound, material shape, manipulated colour, or verbal imagery, the character of the medium itself matters little and the resemblance of his art to any scene or sound or object matters little, compared with this essential function of becoming a channel of communication.
THE PROPOSED SYSTEM

As we have seen through Ernest Robsons' work, words can have a life of their own. The poet conceives the message intent and the word then responds to itself by reacting to sound, stress, and prosodic value. After carefully studying the computer and its natural capabilities, it became apparent that SOUND was the key to connecting poetry to the computer system.

In order to have an interactive system using the computer with human sound, an interface must be built. This box-like hardware connects a small microphone, which carries the voice tone and level, from the mic through the interface box and converts the sound to digital signals. This is done, because the computer can only understand this type of signal. The translated sound then reads into the computer.

COMPUTER
A 100 functions
sound
stress
amplitude
Z

INTERFACE
MIC

GRINNEL
OH
before transformation

GRINNEL
OH
after

31.
Inside the computer memory certain pieces of software have been written, so as soon as the sound reaches the memory, it will translate the word into numerical value. On the screen of the Grinnel, the word or words being spoken have been placed there by the poet, by using a TEXT program or something similar. By placing the cursor on the portion of the word or the whole word, the poetry will be transformed, as the sound transmits through the microphone. The computer and the poet are now working together to create a new form of interactive poetry.

The software necessary for this process is fairly complex. It is necessary that the computer understands certain functions, so it can respond to the input of the sound. These functions are the STRESS level of the voice, the change in volume or pitch, and the pitch, and the LENGTH of the sound. As these qualities are heard, the computer can respond in several ways. 1. Increase in height. 2. Decrease in height. 3. Thicken the letter or letter or letters. 4. Make them thinner. 5. Change the color matrix.

Because of the nature of the entire system, this poetry can overlay on to any picture stored in the picture directory. It will also be possible to connect the picture to the word functions and as the letters transform so would the pictures.

32.
SOME REACTIONS
Poetry by Joan Shafran
Programming does not lovers make

Wrote a story once
Before the world opened
into space modules
of you go to loop
before it happened

About a you and I
Before the transformation
Before I dcl
what it meant
In numerical
Configuration
and lost
sight, onto

Form
Characters
that Sym
Bolize the
Relationship

Far more
clearly than
it really is
Should be simpler
Now

than before the
happen
stance
of figurative speech

Our Numerical value
should be
the same
But different

Variables/fix/does
Not compute
a fault in the
system
Not Ours
The root of the matter lies deep within the heart. Systems analyzed.

To a point of intensive analysis.
I found myself competing in an environment so alien it made me numb with fear. It seemed impossible to fight technology. The scientist how could I begin to translate my feelings into data that seemed relevant and why

It is not a poet's job to judge good or bad it is merely to comment
Polarized Once Again
love song
for computer and human voice

In software night
SOUND
humming
Light emitting diodes
Dark night
Software night
Alone silent flicker
   With the memory of you

In software night
t h r e e dementions
Space transmitting
through micro levels
of memory

Gone are the finite bonds
a friendship true
mapped between the levels
with the memory of you

All the tri-level intervals
All that is cosmic space
all that IS cannot erase
The color matrix
We held as true
Ah, the memory of you

37.
'those Media Technology Blues
for computer aided guitar and human hackers voice

alienation
across the station
Oh those Media technology blues
Think in 'tran
When I can
Oh those technology blues
the only verbal
in a terminal
can't stop those media
maddening blues

I long for your voice
not left with a choice
I put you on my private disk
and play you back without a risk
To stop those Media technology blues

RAM$PASS
Oh up your ass
with those crazy
lazy blues

There is no time
for everyday rhyme
HELP my mag taping blues
I've interfaced
my entire space
God what next
to stop my blues
Poetic reactions to an age

Approaching
Or how I rationalized my existence for the coming Decade
But floated still
In an unseen rhythm
By my scientific neighbor

Or better still
Confessions of 276-46-3037
Hidden under an electric blanket Set at 9

Reading Gothic romances and Scientific American Simultaneously to the rhythm of my personal Molecular battle

39.
CONCLUSIONS

Even contained within the confines of a technological environment, the poet/artist continues to search for a TRUTH that can express and explain understanding of the universe. Mirroring the technologist, who explains through numbers and symbols, the poet responds with words and images, but neither message system evokes understanding.

Communication through the use of technology offers the poet a new way to explore words and their meaning. In order to do this, certain unspoken boundaries must be confronted and transcended.

The nature of the computer, defies the freedom and ambiguity present in most poetic structure. As a poet to assign numerical value to something of weighted meaning is an almost impossible task.

The first problem was to establish a verbal communication between myself and the programmers. To try and tell them what must happen, what must be said, in order for the transformation from the language of the soul, to the language of the machines was a difficult one...PATIENCE is a virtue that both the artist and technologist must learn.

Upon establishing a way of communication with the systems analyst a rapport between poet and machine was the next step. There are several ways to learn about the computer.
For my purposes UNDERSTANDING was the essential component. It became apparent that I could not devote the amount of time necessary to learning everything there is to know about computers and programming, and continue in my original pursuit. The object was poetry, and machine code was not the answer.

I also became aware of the importance of the PERSON, for without the personal input, interactive poetry does not exist. The initial fear being, that the machine would become the artist, and the artist a mere button pusher. Just by realizing that, it became more comfortable for me to know what the computer was all about.

It is a laboring task, to analyze information and then retranslate it, so that the machine can compute. A task painful and frustrating. Throughout the experience, the question WHY kept repeating itself. Why should an artist care to involve personal, emotional work, with a cold, calculating machine.

The computer is unlike any other artist's tool, in that it stores vast amounts of information, and can feed them back to you, as does the brain, and can also find links.

The 'hands on' control is suddenly eliminated, and an abstract or intangible control takes over. The artist now works in soft design, with nothing to touch: the image, gone in seconds, transformed.

41.
The alienation of the artist to machine is an obvious yet intense reality. They are difficult to operate, to understand.

Today most of the world experiences the same estrangement. The old forms of communication are becoming less valid, and media through technological advances grows in importance as the major way to convey information both private and public. The problem arises in that fewer understand the operational processes of these new tools. That is why the artist must CONFRONT and resolve. For left in hands of systems analysts the obscure will become more unintelligible. It is the job of the poet whose interest is communication, not new machines to find a new way.

It is a long road. But this is the POETRY GENERATOR, the beginning of the redefinition of language, a retranslation. It has been yet another step from the CONCRETE poets of the forties who aptly stated that the Word is Dead and it should truly be perceived rather than read.
BIBLIOGRAPHY


FOOTNOTES


2. IBID. p. 1

3. IBID. p.7.


The type and graphic layout of this work was machine conceived and executed on the CPT 8000 at the School of Engineering Word Processing Center and The Visible Language Workshop, Massachusetts Institute of Technology, Cambridge, Ma.