

Hitchhiking through a Maze of Transformations and Filters with a Bag of Data

Univ.-Prof. H. E. Dehlinger, Dipl.-Ing, M.Arch., Ph.D.
Kunsthochschule Kassel, University of Kassel, Germany
e-mail: dehling@uni-kassel.de

Abstract

The disappearance of plotters as peripheral devices makes it necessary to explore alternative output devices like printers for the generation of art work, based on lines and HPGL-code. The findings are frustrating and the conclusion drawn is somewhat devastating: abandon all hope, write new programs to fully take advantage of the printing age. Plot as long as the old hard- and software is still working.

1. Rationale for the trip

The concern of the following notes are some aspects of generative art. Their focus is on generated drawings, composed of lines. There is a program (my program), which generates such drawings. It outputs data having structural properties which are known as HPGL-code [1]. The drawings can (with some restrictions) be viewed on a screen, the goal is, however, to display them on other media like paper, glass, stone. The program as well as the code it generates have been developed for pen-plotters. Very few commands are necessary to draw on a plotter: „Move“ is the command to position the pen at a specific location, together with „pen down“, a line is drawn, with „pen up“ a move to another location is achieved, and a new line may begin there. However, the pen plotters have become extinct, they are no longer available as peripheral devices. Printers have taken over their role, but unfortunately they do not understand the old HPGL-code. If one still chooses to work with this code, one can only

- (1) use the old hard- and software as long as it is working;
- (2) convert the generated code into formats readable by the new generations of printers;
- (3) write entirely new programs, which directly take advantage of the possibilities of printing instead of plotting.

In my present work, I use all three of these alternatives. Mainly alternative (2) will be of concern here. To work along the route suggested by alternative (2) is comparable to a trip as hitch-hiker. One knows the departure location, one has a distant destination but there is no timetable, nor organized transportation means to get there. One tries to get a lift on the highways of software packages, one does not know which route one will travel or how long it will take, how comfortable the trip will be, which detours one must agree to take etc. In short: I am trying to hitch-hike with HPGL-code in my back-pack and hope to get a suitable lift from software packages.

The first step is to find such packages, then it depends which transformations and manipulations they allow. If they do not lead us to the desired destination, one has to get off and find another opportunity.

On this trip we are confronted with a number of questions and phenomena.

2. Questions

Questions arising are e.g.: Should a drawing, which was designed to be plotted, be printed at all? What significant changes do occur? What features of a plotter drawing are actually changed, when it is transferred to a printer and how does this transfer affect the image, its quality, its visual evaluation? Comparing plots and prints will reveal some of the differences of both production processes. The plotter relies on a drawing pen. It mimics, to a certain degree, the mechanical and sequential process of drawing by hand. Some of the important properties of this process are

- only lines of a limited thickness are available and they come in discrete steps;
- crossing lines generate gray-scale values and depth;
- the mechanical nature of the drawing process produces inconsistencies and slight variations in the plotted line, e.g. the starting points of a line become distinctly noticeable or the pen may temporarily fail;
- each pen can carry one colour only.

The printed line also has its own characteristic properties, some of them are:

- a homogeneous and perfect image is achievable;
- black lines (or lines of the same colour) are crossing each other „flat“, the illusion of depth is lost;
- there are no limitations to the width of lines and they may be chosen from a continuum;
- a very large spectrum of colours is available for prints.

From a historic point of view, „Art with a Plotter“ was emerging in exactly the same fashion as „Art with a Printer“ is emerging: Artists simply made use of contemporary output devices for computers. As with the plotters in the past, art using modern print technology is an emerging art. In the course of history, we will see what artists are producing with this technology. The criteria for art work relying on it, have not entirely been formulated yet. However, there is no question, such work will exist.

To change the width of lines and to colour lines is definitely an extension of the possibilities for prints as opposed to plots. How such possibilities may be exploited with benefit is an open question. The above short list of characteristics suggests: there is a large number of plots which cannot be printed, but there are also ones where it may work. We have to try it, when reasoning fails, and exactly this is the justification for travelling through the maze of software packages. One problem we encounter on this trip is the tremendous number of different data-formats in effect. Each software package is able to handle a distinct set of them (to open, display, save or export). Especially the command „save as“ is usually of interest, because it is this command which allows us to transform a set of data from one format to another. To transform the generated data for a drawing by submitting it to a program, to save the transformed data in another format, reopen it in another package, transform anew, change the platform again etc. until finally an exit-possibility to a peripheral device of our choice is found – this in short describes the nature of the trip, which pretty much resembles hitch-hiking.

3. Phenomena

Along this journey, especially the following three phenomena appear to me as irritating, the phenomenon of

- (1) „Detours“
- (2) „The big Temptation“, and
- (3) the „Lucky-Hans-Phenomenon“

3.1 Detours

Meant are the many intermediate stations one has to visit to get a result. It sometimes needs painstaking searches, dead end roads force us to return with frustration, orientation without a road map becomes difficult. Often powerful software packages with quite a spectrum of capabilities

are visited, alone, we are interested in a very marginal feature only: To convert one format into another. The detours are definitely a very painful part of the journey. We are never sure, if not to a far more elegant, comfortable and efficient route is existing. It really is like hitch-hiking, any opportunity to get ahead is welcomed.

3.2 The big Temptation

On the detours we are forced into, we also learn about all the marvelous opportunities offered by the various software packages. Usually they are of considerable magnitude. It is a sweet porridge, from which not to taste is difficult. Transformations and filters are available in abundance. The data out of our back-pack mutate miraculously, new and totally surprising images pop up. A new type of journey suggests itself, by which we are carried from one transformation to the next. The manipulations are far reaching, because they come light footed, with great speed and ease, and they have cumulative effects. Should we stop at the eighteenth layer or add another five? The image we have in our bag is blown away, it disappears entirely, other images grossly different but derived from it move into its place, suggesting „complexity“ in a vague sense. Obnoxiously they claim an existence of their own. The big Temptation suggests vast landscapes of unexhaustible and never seen richnesses of worlds of images, opening up without effort. It is raining images. It is like a spook. Is it over, all questions are open.

3.3 Lucky Hans

Among the fairy tales of the Brothers Grimm is the one called „Lucky Hans“. I cite from the beginning:

After Hans had served his master for seven years, he said to him, „Master, my time is up, and since I want to go back home to my mother now, I'd like to have my wages“.

„You have served me faithfully and honestly,“ said the master, „and I shall reward you in kind“.

So he gave Hans a gold nugget as big as his head, where upon Hans pulled a kerchief out of his pocket, wrapped it around the nugget, lifted it to his shoulder and set out for home. (citation end)

As is known, it is a series of trade ins (transformations) where, objectively speaking, Hans loses with every deal. The wonderful thing in the fairy tale is, this objective fact does not at all affect his luckiness: He exchanges the gold (the wage for seven years of service) for a horse, the horse for a cow, the cow for a pig, the pig for a goose, the goose for a grindstone, which he loses in a

well. Each of these trade-ins he considers as a personal favor. Looking at the same story from the viewpoint of the trading partners of Hans, we come to a slightly different conclusion. The Lucky-Hans-Phenomenon then describes the step-by-step loss of a valuable good. In this form, we experience it also on the hitch-hike through the software packages: We lose at every step, irreversibly, which is communicated to us by the „undo button“ staying mute.

4. „Wurf“ versus „Griff“

For the generative act, we can identify different approaches [2]. One of them could be described as: „The intentional execution of a concept“, and another: „The probing search along an unknown road, supported by the hope to find something“.

With the intentional approach, the artist tries to aim directly at the goal, it is the lucky hit which he is after. The probing search ends with a catch. Searching and finding are central concepts to this approach. „Hit“ and „Catch“ are two metaphors for two different generative scenarios. In my own work I place a high value on the „Hit“. The execution of an idea by a program is a direct means to a result [3,4,5]. To catch something requires a process, which eventually will lead to a state, which by declaration (decision) is proclaimed the result. The process of development is interrupted (ended) at an arbitrary, beforehand unknown point, and the last „state of the system“ is singled out and raised into the position of a result. The result then suddenly stands for itself, the generating process becomes entirely unimportant in the moment of the decision. It is (usually) not even traceable any more. The result is what counts, not the process which generated it. Of course, this holds also for other generative approaches.

On the route towards a result, the artist experiences states of logical as well as associative analysis and reasoning, states of reduced perception and very alert states, situations, where suddenly all constellations fall into the right positions.

The context which we accept for our work is the sum of all constraining conditions, for which we exclude the possibility of any change. We accept them as given, and by adopting such a position, we introduce elements of resignation. We prefer to arrange ourselves. It is a privilege of the artists to have complete control over their work. They can develop concepts, design their tools and within a close feedback-loop with the emerging work, they alone decide, how it converges

to a result. In contrast to many other professions, there is no accepted context for art. It is up to the artist to decide what is acceptable. When hitch-hiking on the highways of the software packages, there is a context. It is defined by the restraining conditions of the packages one chooses to ride on. The disappearance of the plotters, once a booming line of development of computer hardware, also sets constraints, which one can overcome only with great effort.

From the three alternatives, mentioned in the beginning, alone the third alternative offers the potentials searched for.

References

- [1] See for example: Interface and Programming Manual, HP7475A Graphics Plotter, Hewlett Packard Company, San Diego.CA, 1983
- [2] Soddu, C., Generative Art. Proceedings of the 1999 Milan International Conference Generative Art «99. Generative Design Lab, Milan Polytechnic, Milan 1999
- [3] Dehlinger, H.E., A Genetic Approach to the Generation of Line Drawings; Proceedings of the «AIDS99 Symposium on Creative Evolutionary Systems, Edinburgh College of Art and Division of Informatica, University of Edinburgh, 1999
- [4] Dehlinger, H.E., The Artist's Intentions and Genetic Coding in Algorithmically Generated Drawings, Generative Art , Proceedings of the 1998 Milan International Conference GA '98. Generative Design Lab, Milan Polytechnic, Milan 1998
- [5] Dehlinger, H.E., Q. Dongxu. Art Experiments and Explorations into the Universe of Machine Generated Drawings, Proceedings of ISEA 1997. Chicago