

## Interactive Exploration of Corporate Logos: From Mercedes Benz to Sea Creatures

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### Abstract

Corporate logos make ideal points of departure for interactive explorations of graphical phenomena. Surprisingly simple starting points can lead quickly to the discovery of compelling graphic effects that are impossible to anticipate at the outset. I report on one exploration that follows a discipline I have experimented with recently: I start with a static logo, parameterize its geometry in obvious ways, and explore the parameterization interactively. Hybridizing ideas collected from individual explorations leads to surprising new forms.

### Introduction

As an interactive graphics software developer with a background in design, I have had a longstanding passion for exploring graphical phenomena via computer. Typically, I explore spaces of designs parameterized by both continuous and discrete values. The best explorations are those where I succeed in setting up the conditions for the unexpected to happen.

In the past year I have experimented with a discipline of exploration that has been particularly successful at producing interesting, unexpected forms. I start by parameterizing the geometry of a corporate logo, typically in obvious ways. From there I explore the resulting space of designs, and refine or elaborate the design space as interesting avenues of exploration are suggested by the graphics I encounter. Then, after gaining experience with the individual design spaces, I hybridize them, in effect swapping their genetic material to produce new spaces of designs for exploration. New combinations of parameters yield emergent properties in the forms that I cannot possibly anticipate, and thus the explorations achieve that quality of adventure and discovery that makes them worthwhile.

Corporate logos are ideal starting points for such explorations because they often distill a single idea in simplified geometric form that is straightforward to parameterize. They typically have some element of visual interest that is worth exploring. Books and online resources for logos abound; the logos in this paper are taken from [1] and [2].



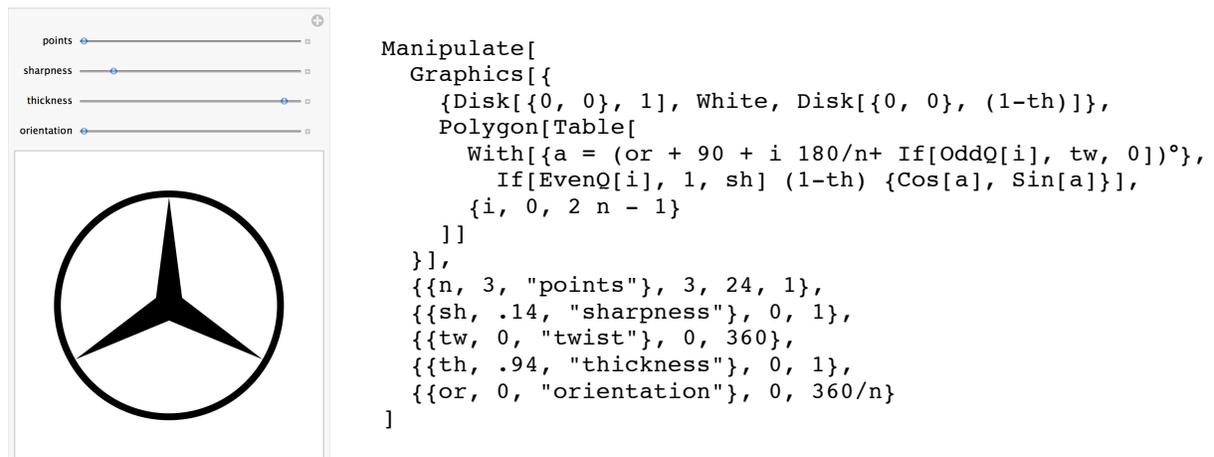
**Figure 1:** Some logos suitable for interactive exploration: Mercedes-Benz, original design by Gottlieb Daimler; magazine logo, Franco Grignani; Reyflex Textilien, Norman Gorbaty and Ken Kirkwood Agency; concert hall logo, Peter Andermatt.

A critical component for successful exploration is the software used to construct and explore the design spaces. It must be straightforward to describe the parameterization of a logo, and the description must be “malleable” enough to permit easy, spur-of-the-moment changes. It must also be trivial to construct interfaces that connect controls or direct-manipulation gestures to the parameters of the design spaces, and the interfaces must be similarly malleable. The system I use for exploring, Mathematica [3], satisfies all of these requirements, as well as providing a wealth of additional functionality that I can draw on when my explorations take unexpected turns. Its very high-level programming and interface constructs keep my explorations in pace with my brain as it flings out new ideas left and right.

Although my motivation for these graphical explorations is primarily recreational, they are equally well suited for studio and classroom use in teaching graphic design concepts, generating raw design material, and as a vehicle for teaching programming.

### Exploring the Mercedes Benz Logo

The Mercedes Benz star logo, the leftmost image in Figure 1, is a good example of a deceptively simple starting point that leads to a surprisingly rich space of designs. Its geometry is easily described in a few lines of Mathematica code, with some obvious parameters controlling the number of points on the star, the sharpness of the star's points, the twist of the star's points about its center, the thickness of the outer circle, and the orientation of the star. Figure 2 shows on the right the complete code necessary to yield the interface for exploration shown on the left. The exploration interface is available for download as part of the Wolfram Demonstrations Project [4].

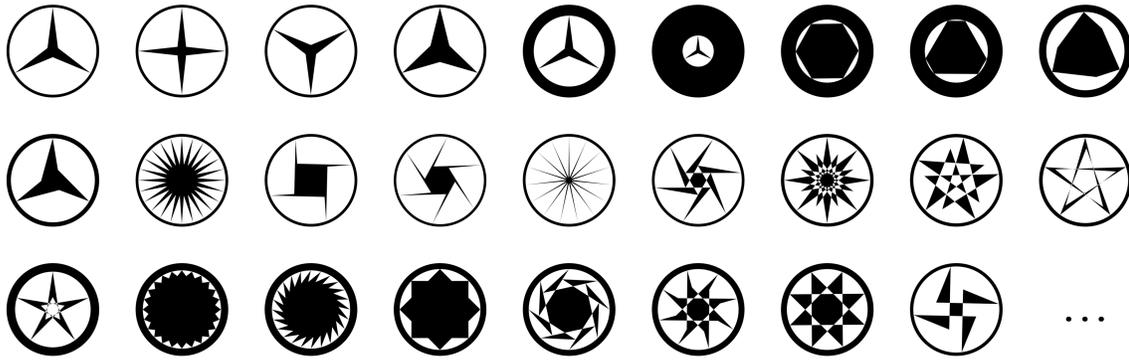


**Figure 2:** Mathematica interface and interface code for exploring the Mercedes Benz logo.

The Mathematica code consists of the exploration function `Manipulate` wrapped around a `Graphics` expression that describes the logo image. The `Manipulate` function builds an interface that connects parameters such as `n`, `sh` and `or` in the `Graphics` expression to interface controls, in this case all of which are sliders. The `Graphics` expression contains a black unit radius `Disk` overlaid by a slightly smaller white `Disk` that together form the circular rim of the logo. The `n`-pointed star is described by the `Polygon` expression, whose argument is a list of `2n` point coordinates calculated as polar values of alternating radii sweeping around the center of the logo.

With this `Manipulate` interface, you can easily explore the relative graphic weights of the star and circle, and the semantic import of the number of points on the star and its orientation. (The early Daimler-Motoren-Gesellschaft in fact registered, but never used, a 4-pointed version of the logo.) Although such

subtle variations of the logo are interesting from a graphic design standpoint, they are not the goal of my explorations. I am interested in what I can't foresee, and that is most likely to be found at the edges of the parameter space. Figure 3 shows a series of snapshots from along the path of a broad-ranging exploration. The diversity of designs that this simple parameterization of straightforward geometry yields is astounding, including images that suggest cinematography, folk art, heavy equipment, compass points, occult, and pharmacology.

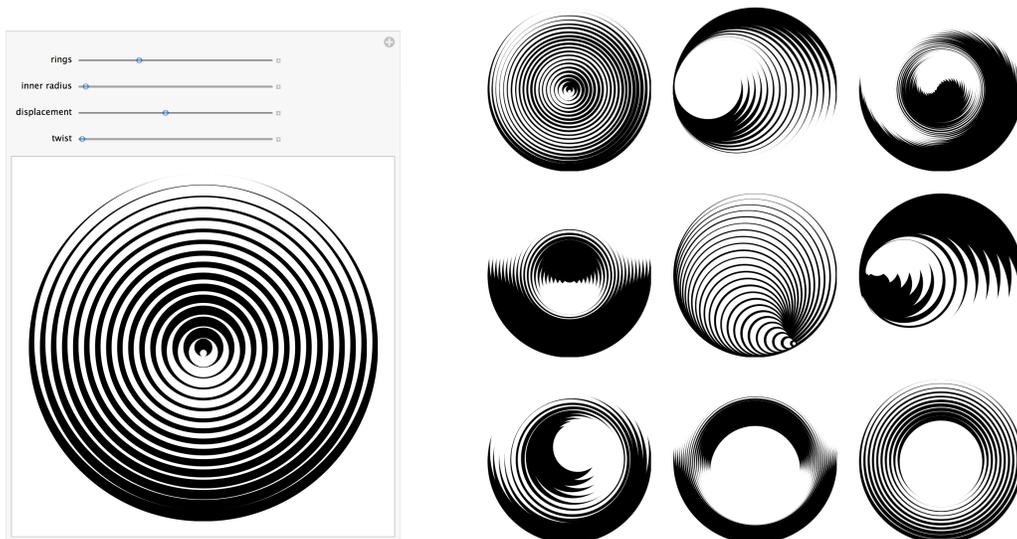


**Figure 3:** *Exploration of the Mercedes Benz Logo.*

I was initially surprised that such a variety of designs would arise from such a simple logo. But that's often the case. This tiny corner of the design universe contains an infinity within itself. It's like exploring a drop of pond water with a microscope. The universe within is dazzling.

### Exploring a Logo by Grignani

In a similar vein, I explored the second logo from the left in Figure 1, designed by Franco Grignani for a special edition of a magazine. Slight offsetting of the centers of a stack of black and white disks gives rise to an elegant 3D effect. I parameterized the amount of offset as well as the number of rings and the inner disk radius, and added some twist and a control for dragging the point to which the disks converge. The Mathematica code for the interface [5] is similarly compact to that for the Mercedes Benz logo.



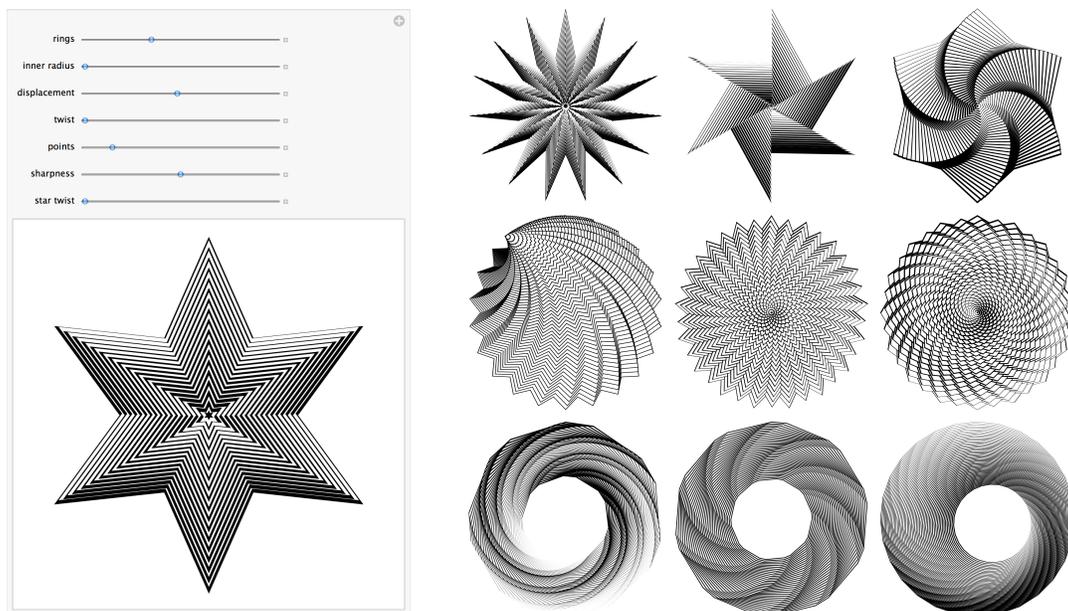
**Figure 4:** *Exploration of a logo by Grignani.*

Once again, parameterizing this simple idea leads to a wealth of interesting phenomena. The resulting designs range in character from bold woodcut to fine engraving to half-toned artwork. Several of these variations would stand well on their own as logos.

### Hybridizing the Benz and Grignani Logos

After exploring the Mercedes Benz and Grignani logos separately, I combined ideas from both into a single exploration. If the separate design spaces contained interesting designs, combining aspects of both might be expected to yield unexpected forms that result from the emergent properties of interacting parameters. I was not disappointed.

I extracted the star-drawing code from the Mercedes Benz code and packaged it as a near drop-in replacement function for the `Disk` expressions in the Grignani code. Some extra arguments were required to control the number of points, sharpness, and twist of the stars. With the resulting `StarPolygon` function, hybridizing the exploration interfaces was a no-brainer: replace `Disk` with `StarPolygon` in the Grignani code, add the extra arguments, and copy the controls for the extra arguments from the Benz `Manipulate` expression to the Grignani `Manipulate` expression. Here is the resulting interface [6], with some initial explorations shown to the right.



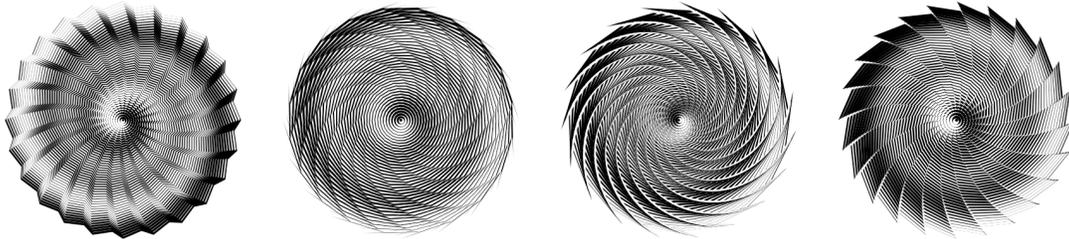
**Figure 5:** Exploration of hybrid Mercedes Benz and Grignani logos.

The snapshot of the interface on the left of Figure 5 shows what you'd probably expect of this hybrid: a star-shaped form with a three-dimensional effect due to the stacking. The space of forms traversed by this `Manipulate` contains stars, shell-like forms, whorls, and spirals, as well as some more unusual ropy forms and finely-textured abstract *objets d'art*.

But these forms don't hint at the real treasure hidden within this design space. The emergent properties that result from the interactions of the angular stars with the displacements in the stack give rise to entirely new effects not shown by either of the parents, effects that are hardly humanly possible to predict. There is no substitute for actually exploring the space and seeing the forms it contains to discover

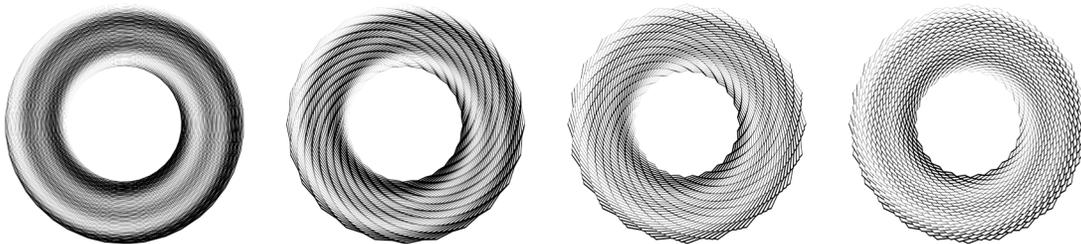
the possibilities. Within certain narrow bands of parameters, the interactions between the numbers of points on the stars, their sharpness, the displacements of the stacked forms, and specific fineness of the stacking conspire to yield lustrous, luminous, metallic and glass-like forms; implausible forms given the humble materials—stacked black and white stars—from which they are formed.

The first to catch my eye were these medallions with a metallic sheen.



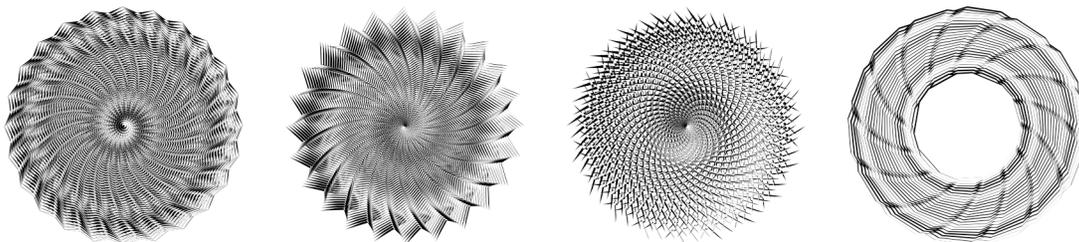
**Figure 6:** *Benz-Grignani medallions.*

Exploring and refining those led to metallic rings with beautiful, brushed-surface textures. At coarser settings, the brushed effect gave way to textures that cried out to be touched. Maddeningly, they were locked behind my smooth screen in the course of my explorations.



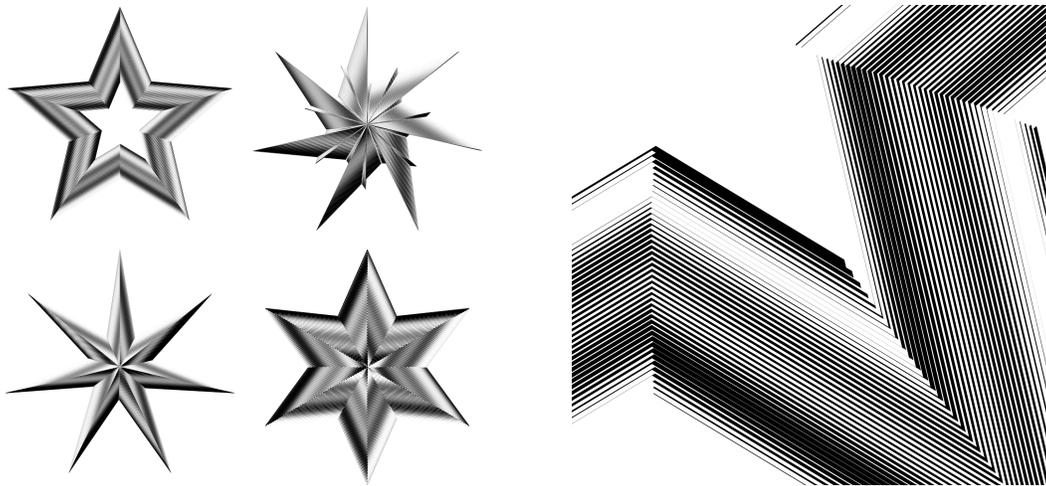
**Figure 7:** *Brushed metallic and textured rings.*

When the stacked stars are complex and spiky, the resulting graphic "noise" looks like the internal reflections in glass and the forms take on the appearance of molded glass and cut crystal.



**Figure 8:** *Glass-like forms.*

A simple change I made to how the “twist” parameter is applied to the stack gave rise to forms with an entirely different character. I modified the use of the twist value so that it was applied only to the displacement of the white forms in the stack against the black rather than to each white and black pair as a whole. That meant that the black forms in the stack stayed put while the white forms gyrated slightly about the center. That change yielded these shiny 3D pewter ornaments.



**Figure 9:** “Pewter” Benz-Grignani stars.

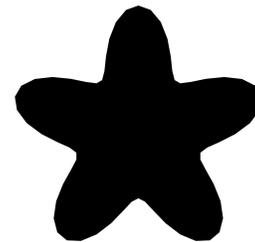
Remember, there is no 3D- or materials-modeling going on here. The apparent metallic and 3D effects are due purely to the shading that results from the slight displacements of the black and white forms in the stack. Engravers, of course, have been taking advantage of these effects for centuries. On the right in Figure 9 is a magnified view of the first star on the left. Step back a few paces from the image, and you'll see the fine lines dissolve into the smooth gray shading of the unmagnified figure.

### A Fortunate Mistake

About the time I thought I had exhausted the possibilities that the Benz-Grignani exploration offered, I made a programming mistake that opened up an entirely new and compelling world of “engraved” forms with a wonderful organic character.

I was thinking about generalizations of the star, and in particular, stars with rounded points. I wrote this replacement for my `StarPolygon` function that uses a sinusoid to produce a gently undulating, rounded star with  $n$  points:

```
RoundStarPolygon[c_, r_, sh_, n_] :=
  Polygon[Table[
    (c+r(1-sh(1-Sin[n a])/2))
    {Cos[a], Sin[a]}, {a, 0, 2π, 2π/64}
  ]]
Graphics[RoundStarPolygon[{0,0}, 1, .5, 5]]
```



**Figure 10:** *The RoundStarPolygon function and its output.*

The number of polygonal steps I chose initially was a little large, resulting in a less than smooth outline, so I added an explicit resolution parameter to give myself control over how finely the star was rendered. I cranked the resolution up to 100 in an example to test my new function. And I got the ink splat on the left of Figure 11 instead of the smoothly rounded star I had expected.

When I examined my code, I realized that in my test example I had changed the  $n$  parameter for the number of points on the star to 100 instead of inserting the *additional* resolution parameter of 100.

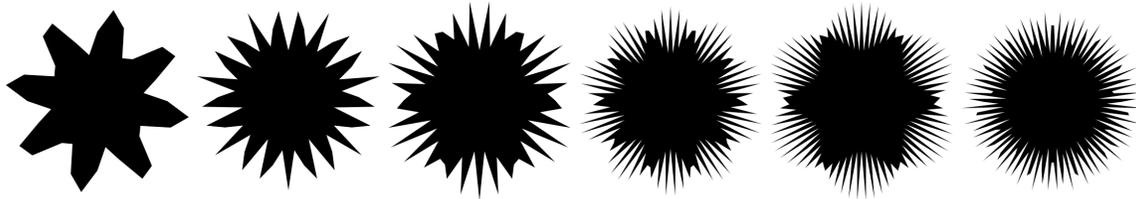


**Figure 11:** An “ink splat” and how it is generated.

Mathematica used the original, 4-argument version of my function to render a star with 100 points at a sampling resolution of 64.

The illustration on the right of Figure 11 illustrates what was happening. A full-resolution, 100-point star is shown in gray. When that star is rendered at the low sampling resolution of 64, the step size as the radial in the RoundStarPolygon function sweeps around the star is large compared to the spacing of the star points. An irregular figure results from the infrequent sampling.

I realized that my mistake was an opportunity. Rendering stars at low resolution was an interesting phenomenon in its own right, which I immediately explored by dropping the new RoundStarPolygon function into a Manipulate interface:



**Figure 12:** Stars drawn with low sampling resolution.

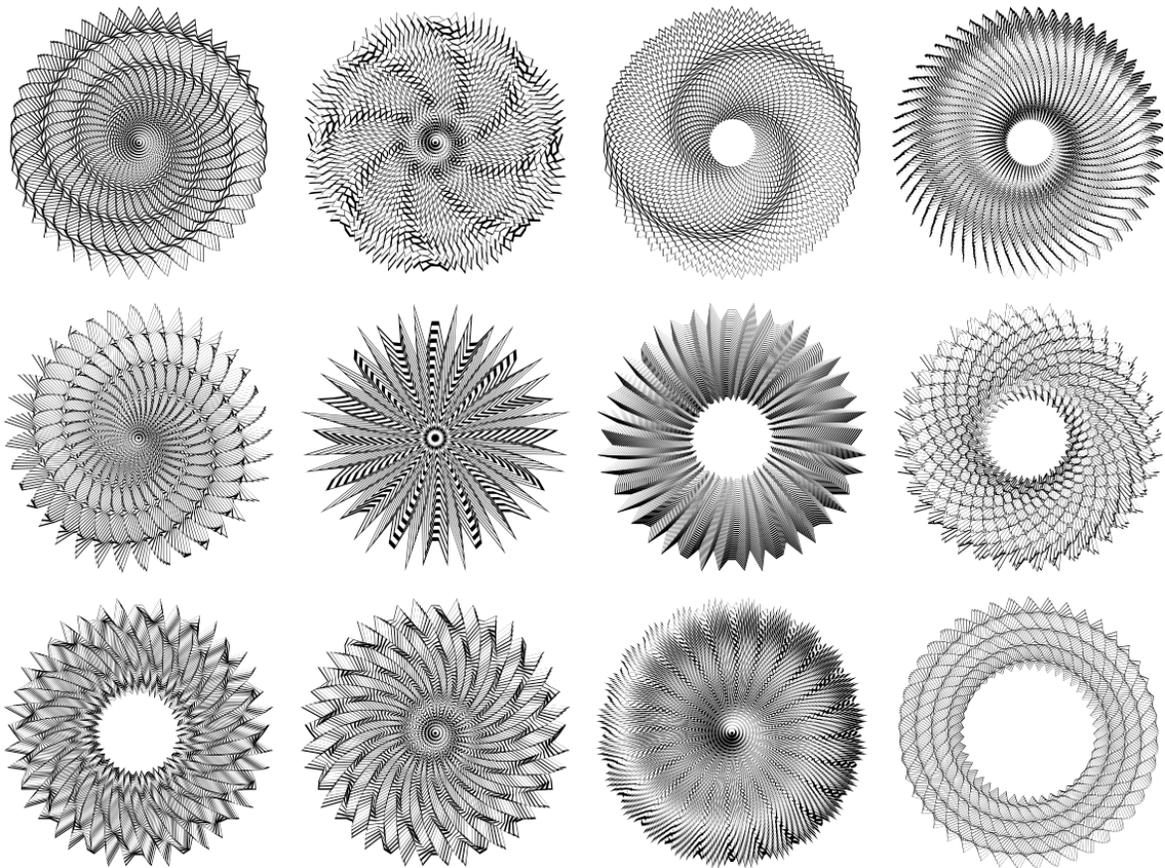
But what would happen if the interaction between the number of star points and the resolution was combined with the interactions that gave rise to the beautiful “engravings” in the Benz-Grignani hybrid? It had the potential to yield fantastic forms—or a fantastic mess.

I dropped the modified RoundStarPolygon function into my hybrid exploration interface, added a control for the resolution and started exploring. The result was *not* a fantastic mess, but a world inhabited by sea creatures and whorled growths, forms with a pleasing balance of rigid symmetry and organic irregularity (Figure 13).

I could not have anticipated these forms, nor could I have intentionally created them from scratch. The visual effect of the fine shadings and spiral geometries is not something that can be easily reasoned about; you have to actually see the forms to grasp their impact. There is no substitute for creating the design space and exploring its contents.

## Conclusion

There is of course much, much more out there to be discovered. Anyone who explores such parameterizations, is alert to new possibilities, combines ideas, and seizes on mistakes is likely to encounter compelling forms that no one has yet experienced. Logos provide a practically unlimited source



**Figure 13:** *Sea creatures and whorled growths.*

of starting points for exploration, and hybridizing design spaces is likely to set up the conditions for the generation of exciting and unexpected forms. There may be no substitute for actually doing the exploration, but the journey itself is as exciting as the results.

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## References

- [1] Michael Evamy, *Logo*, Laurence King Publishing, 2007
- [2] Yasaburo Kuwayama, *Trademarks & Symbols Volume 2*, Van Nostrand Reinhold Company, 1973
- [3] Mathematica, <http://www.wolfram.com>
- [4] Christopher Carlson, "Exploring the Mercedes-Benz Logo" from The Wolfram Demonstrations Project, <http://demonstrations.wolfram.com/ExploringTheMercedesBenzLogo/>
- [5] Christopher Carlson, "Exploring a Logo by Grignani" from The Wolfram Demonstrations Project, <http://demonstrations.wolfram.com/ExploringALogoByGrignani/>
- [6] Christopher Carlson, "A Hybrid Benz-Grignani Logo" from The Wolfram Demonstrations Project, <http://demonstrations.wolfram.com/AHybridBenzGrignaniLogo/>