

Geometry in the Pocket

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Abstract

This paper describes two Android smart-phone applications, Starking and TilerKing, which create star-shaped patterns and geometric tilings via gestural interfaces.

Introduction

Increasing role of smart devices in today lives has inevitably resulted in the appearance of a huge tide of applications for different purposes. However, only a few of them concern with creativity and artistic creation, but alone with a math-art theme. Both made by the same couple of creators, Starking [1] and TilerKing [2] are two instances of these math-art applications that let one create geometric star shapes and tilings. Both of the applications have free and pro versions available for download at Google Store, with the difference that save button does not work in free versions. Download links could be found at the end of the paper in the references section.

Starking

Starking is a simple application with only a few available parameters that allow you to create a range of simple to complex star-based patterns. Everything starts from an n -pointed star, where n can change from 1 to 18 (values 1 and 2 for n will, of course, not create desirable star shape). A layering option lets the user fill the outer angles of the star with kites a couple of times and consequently shape new exterior n -pointed stars with different radiuses, allowing outward expansion. Radiuses 1 to 4 let the user change the angles of different sets of vertices from inside to outside, positive or negative, which can cause interesting intersections between inner and outer stars. Another option divides each side of the star into two new sides, the position of new sets of vertices being defined by means of two more options. These options work together to enable the user to create many complex and connected self-intersecting shapes. When the few given parameters combine together, they provide such an interesting tool that one can amuse oneself for hours creating geometric star shapes. Here you can see the result of a number of tries I gave to Starking (Figure 1).

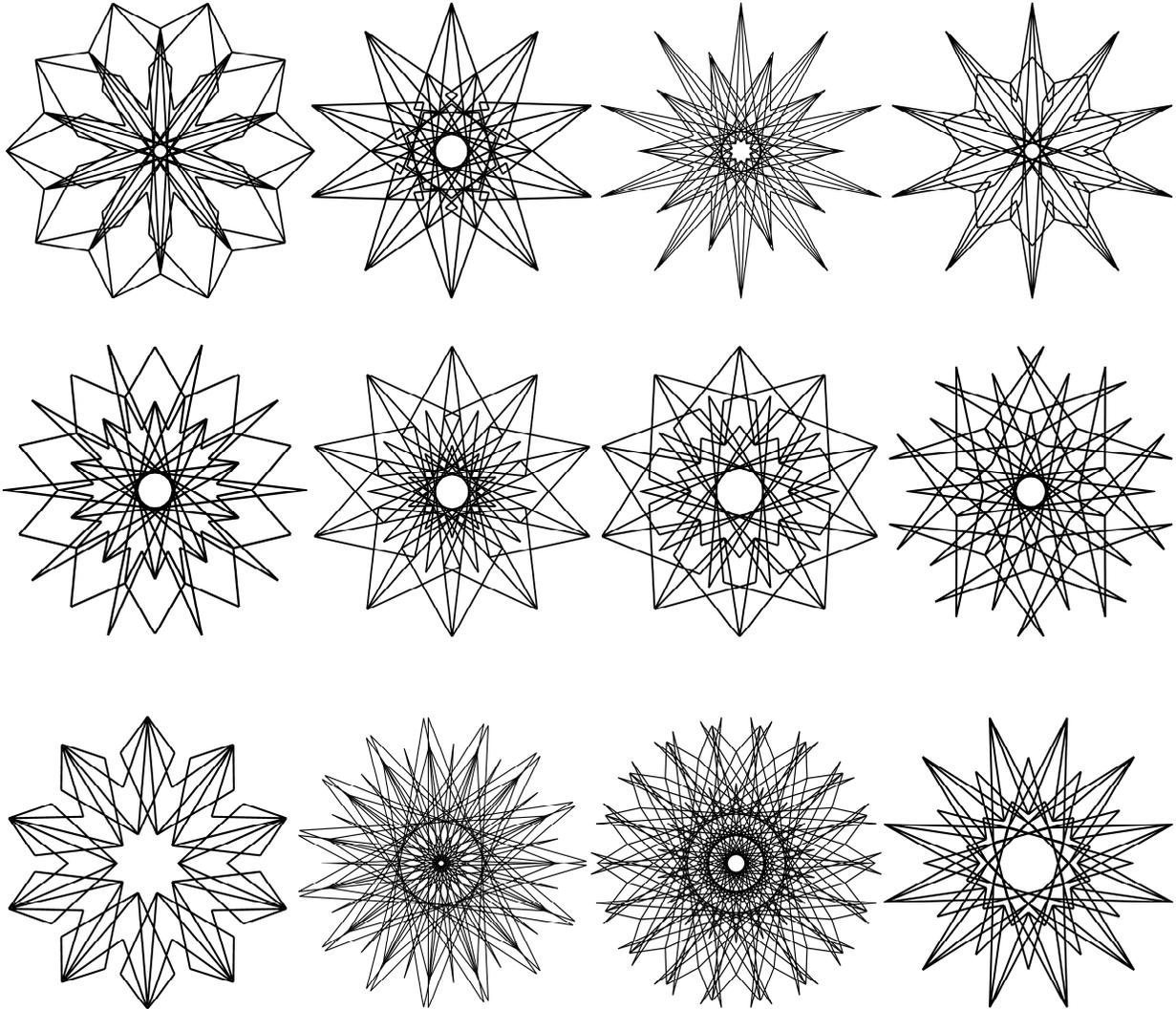


Figure 1: *Star shapes created in Starking.*

TilerKing

The TilerKing application works similarly to Starking. But instead of representing single star shapes, TilerKing arranges them in a uniform tetragonal or hexagonal manner. Additional options change the radius and distance of the vertices of gaps between main tiles. Like Starking, everything works in real-time. Figures 2 and 3 show some examples.

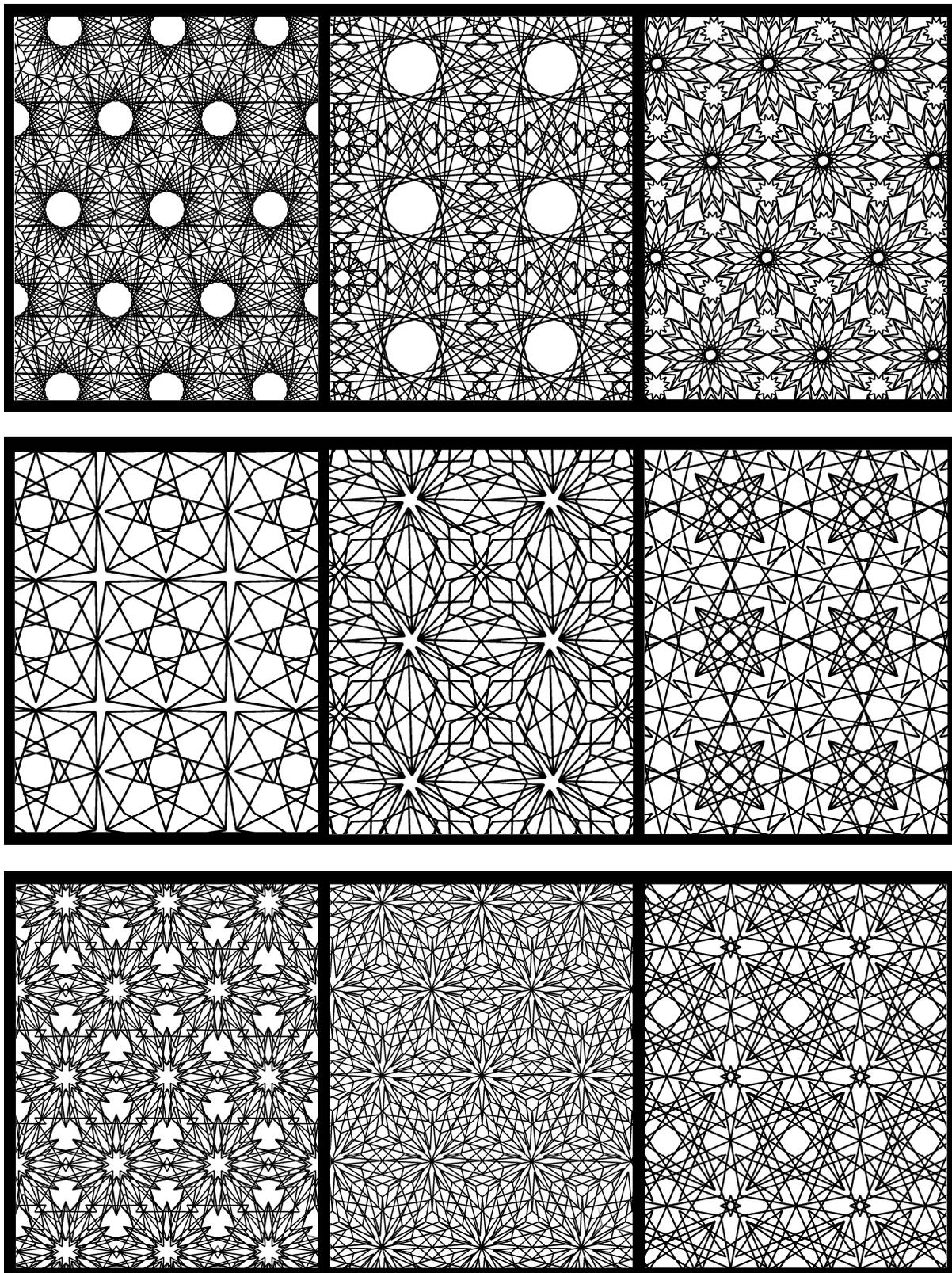


Figure 2: *Tilings created in TilerKing.*

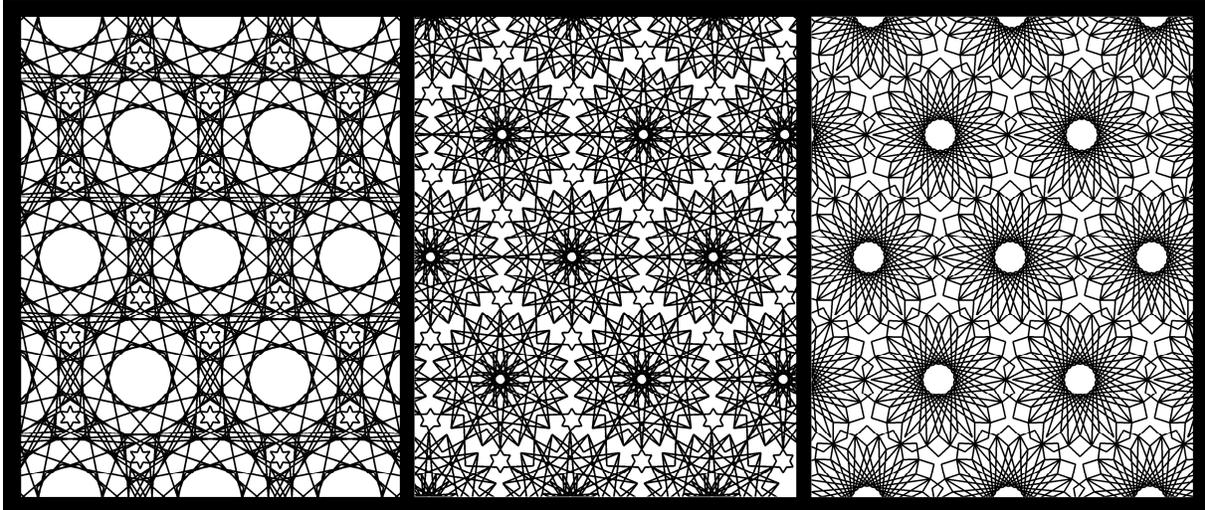


Figure 3: *Tilings created in TilerKing.*

A positive side of both applications is the ability to easily save or export projects as vector or image files. This makes them easy to open in other design or image processing programs.

The best aspect of these programs is that the user need not enter or set numbers manually, but can change them by moving a finger on the screen of the device. This reduces the rigidity of the applications and gives them a feeling of real-time interaction. Anyone of any age can enjoy playing with these designs wherever they find themselves.

Both applications are recently released first versions. They still have minor and major weaknesses. The math used internally occasionally has inconsistencies between forms and lines, so that the user will not always have geometrically perfect results. Additionally, the lack of an accurate control on numbers or the lack of a snap-to-vertex system makes working with the designs somewhat difficult and imprecise. Sometimes one cannot match lines or vertices perfectly as desired.

Although the simplicity of the applications is a feature, a larger number of geometric or other options for editing and coloring purposes could improve the applications to a more professional level, presenting more freedom to unleash creativity.

All in all, these applications, taking account of their features and defects, are a promising way to explore geometric patterns and might encourage mathematicians, computer scientists, and artists interested in Android programming to experiment with new possibilities in this field.

References

- [1] Mansourifar, Hadi & Mansourifar, Hamid-Reza,
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- [2] Mansourifar, Hadi & Mansourifar, Hamid-Reza,
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