An R Program to Visualize an Interesting Correlation Between the Golden Age of Dutch Art and the Golden Age of Mathematics

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I happen to have an interest in Dutch art of the seventeenth century, in particular Johannes Vermeer and Pieter de Hooch. Please see my somewhat humorous visuals at https://youtu.be/TJxRXCz2imE and https://youtu.be/y6Ijyxzf8rw.

My other interest is watching math and physics channels on YouTube. When watching the videos in my areas of interest, I noticed that there are several mathematicians whose names and theorems come up very frequently. By chance I happened to come across a timeline of mathematics on the excellent site at https://mathigon.org/timeline. I noticed these same mathematicians happened to be clumped together in the math timeline, around the seventeenth century. I did a double-take when I realized that this time frame completely overlapped the time frame for the golden age of Dutch art.

I was so excited that I decided to construct a timeline for the Dutch artists modeled after the highly professional layout and color scheme of the math timeline. I also wanted to automate this process, as I might need to make revisions, or add additional information. I developed a program in the R language, that provides a lot of resources for developing graphics applications. I incidentally realized that the program would potentially have additional applications that might be of interest to a wider audience, so I made the program, called "timeLineGraphics," freely available through the R program CRAN distribution site https://cran.r-project.org/.

Because of the large number of outstanding Dutch artists of the seventeenth century (see *e.g.,* https://en.wikipedia.org/wiki/Dutch_Golden_Age_painting), I decided to limit the number of artists that I depicted, since even a few

examples made the point, and including more would make the visual too cluttered and not amenable to immediate visual appreciation.

The final result of generating the Dutch artist timeline and juxtaposing it with the relevant portion of the math timeline can be viewed at https://barryzee.github.io/vermeer/cssOverlay.html. Using trial and error, I was quickly able to align the time scales of the two timelines perfectly. I chose to make the horizontal strips for the artists a little taller than for the mathematicians, to better display the examples of their art.

When the web browser page is zoomed out a bit, the entire ensemble can be viewed in a single screen, and the correlation in time becomes immediately evident. Actually, I can't believe how well this turned out, and I keep looking at it in amazement.

The R program can also be used for more mundane things. I constructed a fictional timeline of "Henry's Life" https://barryzee.github.io/henry-timeline/henry.html as an example. In my web browser, I zoomed in a couple times to see the images a little more clearly.