The Evolution of Artistic Filters

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Approach

Automatic evolution of filters: no user interaction
Strongly-typed genetic programming
Multi-objective fitness evaluation with diversity
1. Target image colour matching
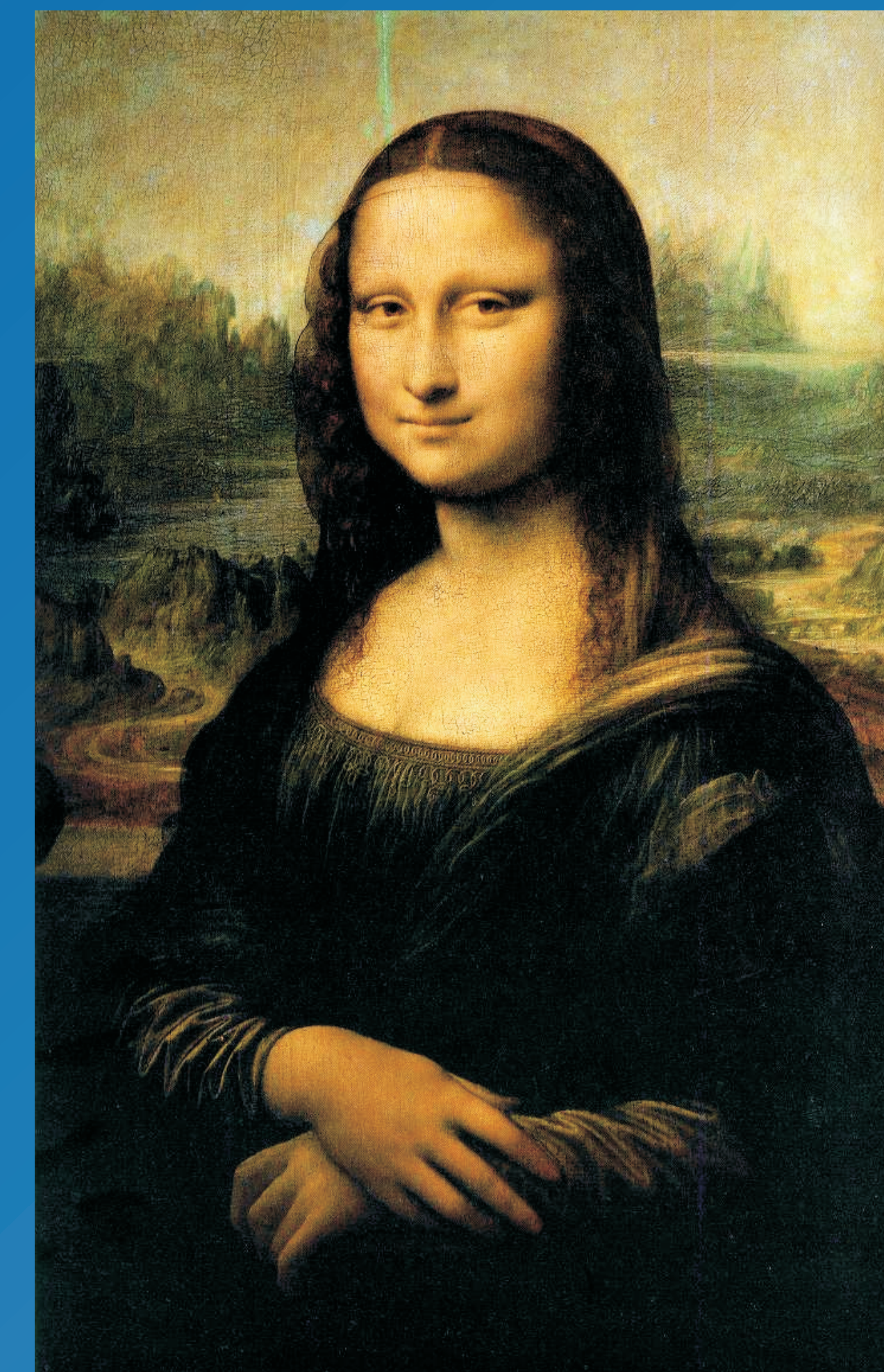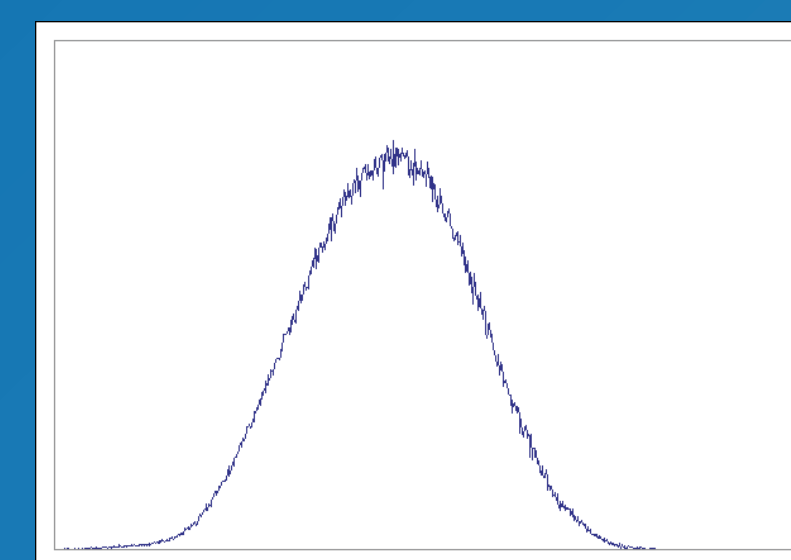2. Ralph's Model of Aesthetics

Aesthetics

Bell Curve Fit of Colour Luminosity
- based on empirical study of 100's of masterpieces
- creates balanced images that favour paint primitive
- discourages noise and flatness
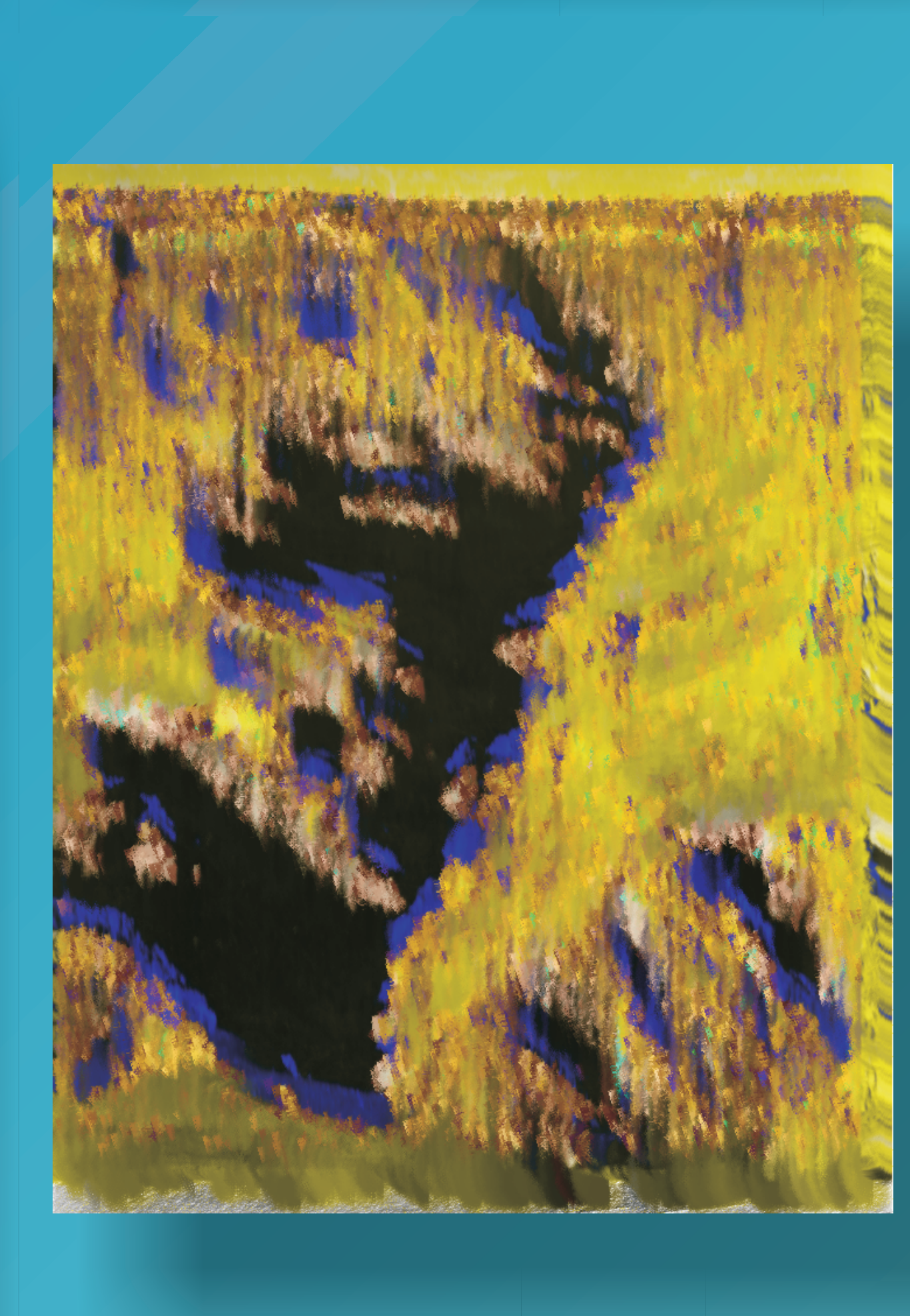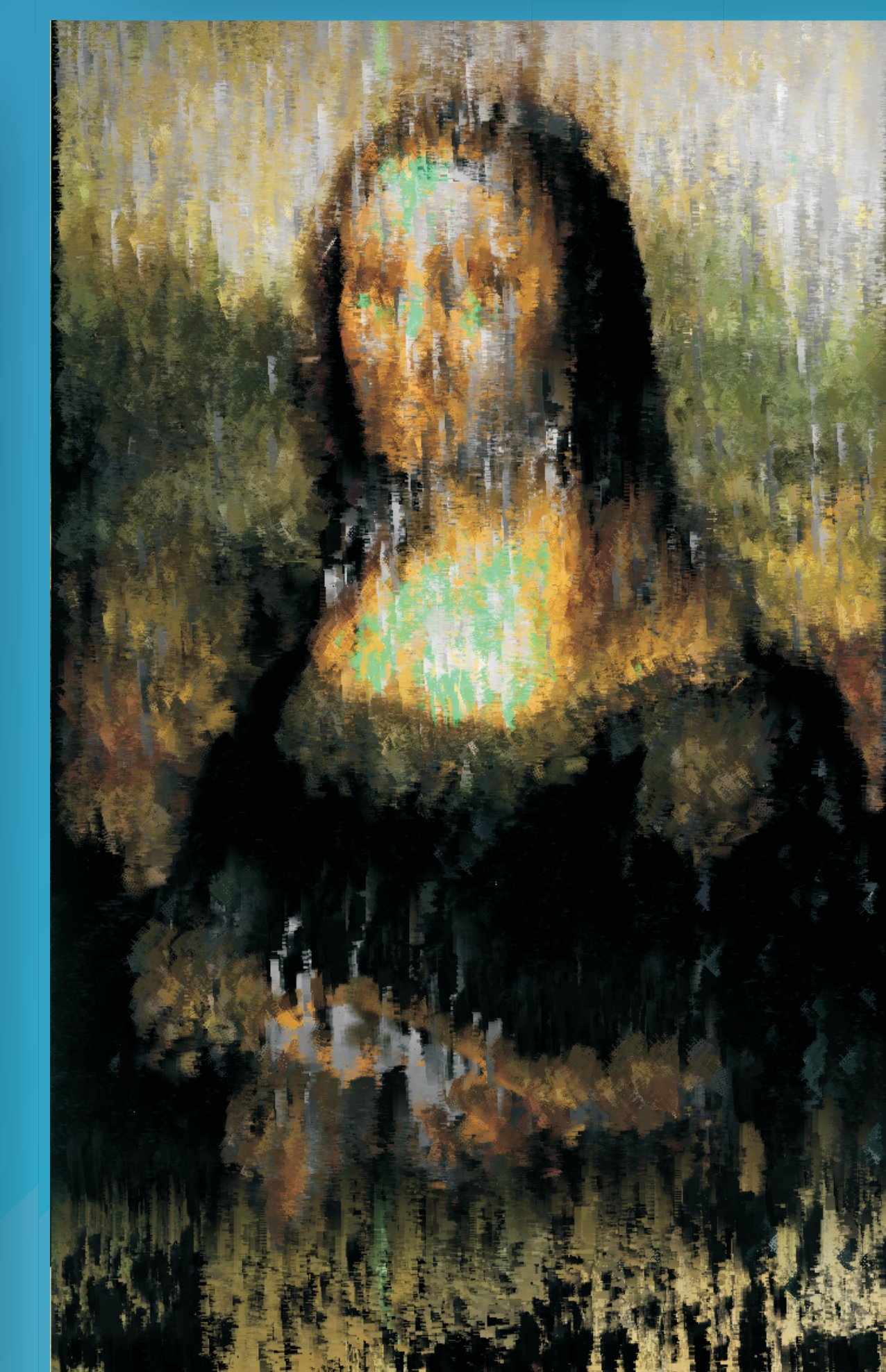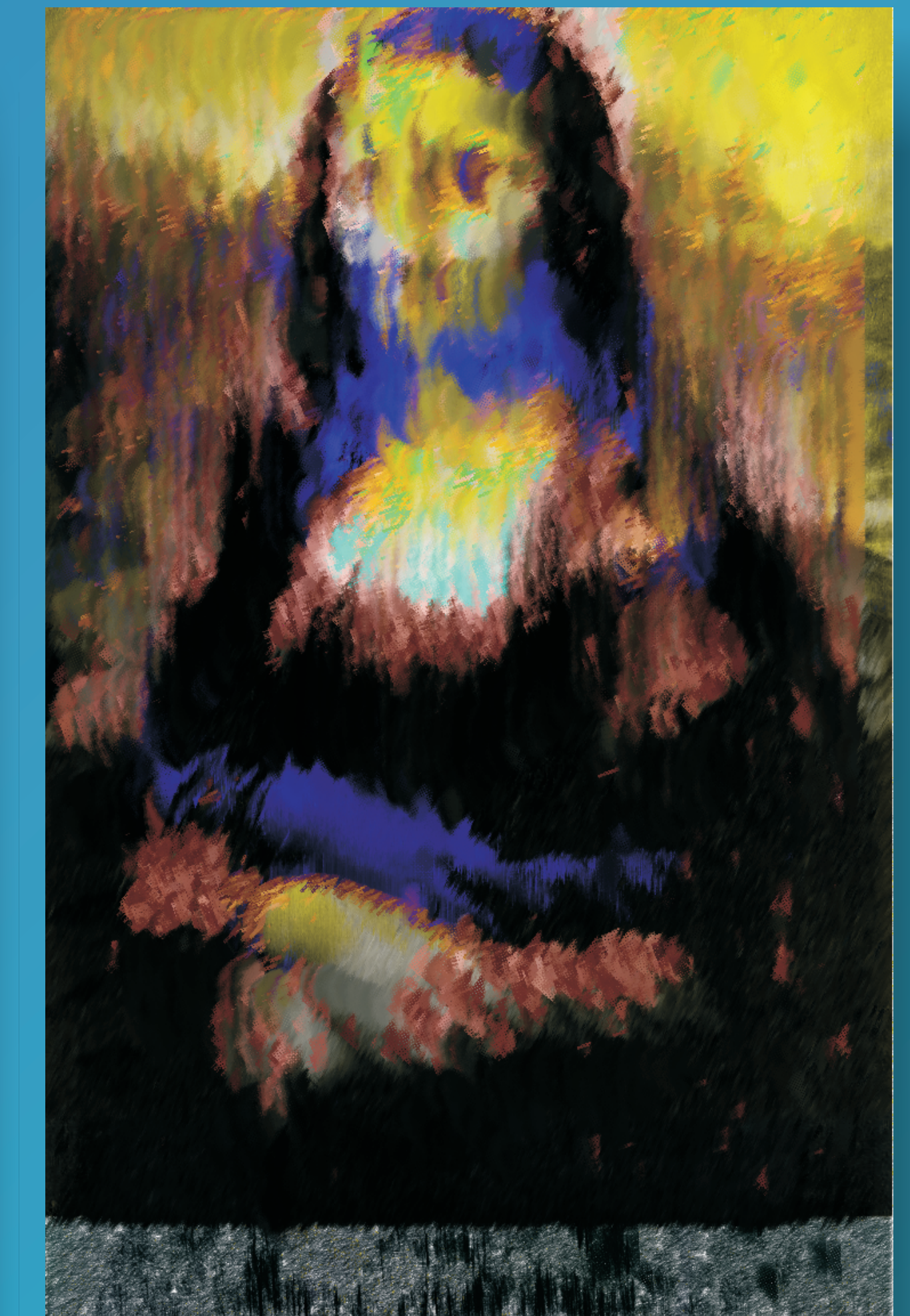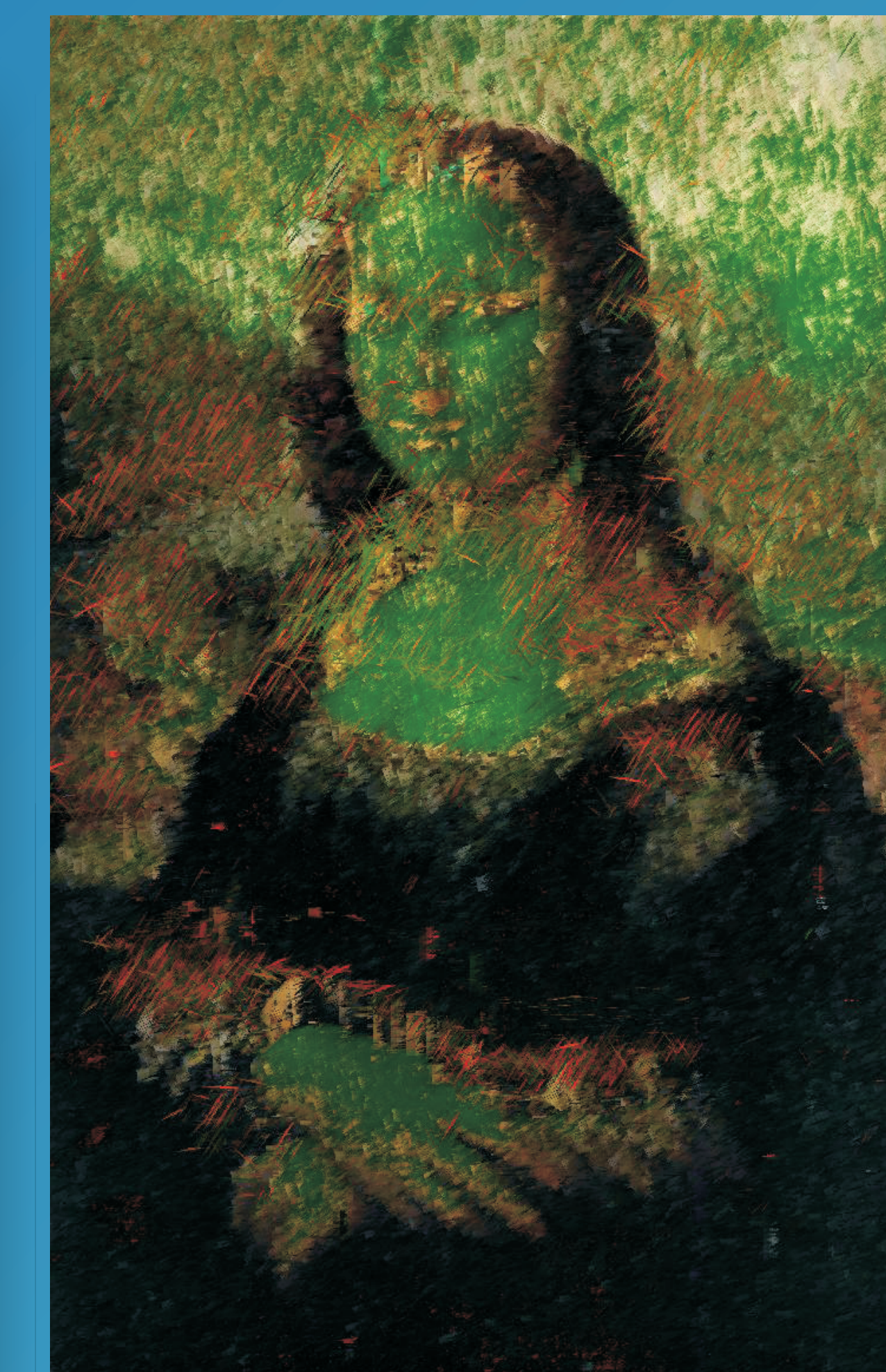- Deviation from normality (DFN): lower = fit to normal distribution
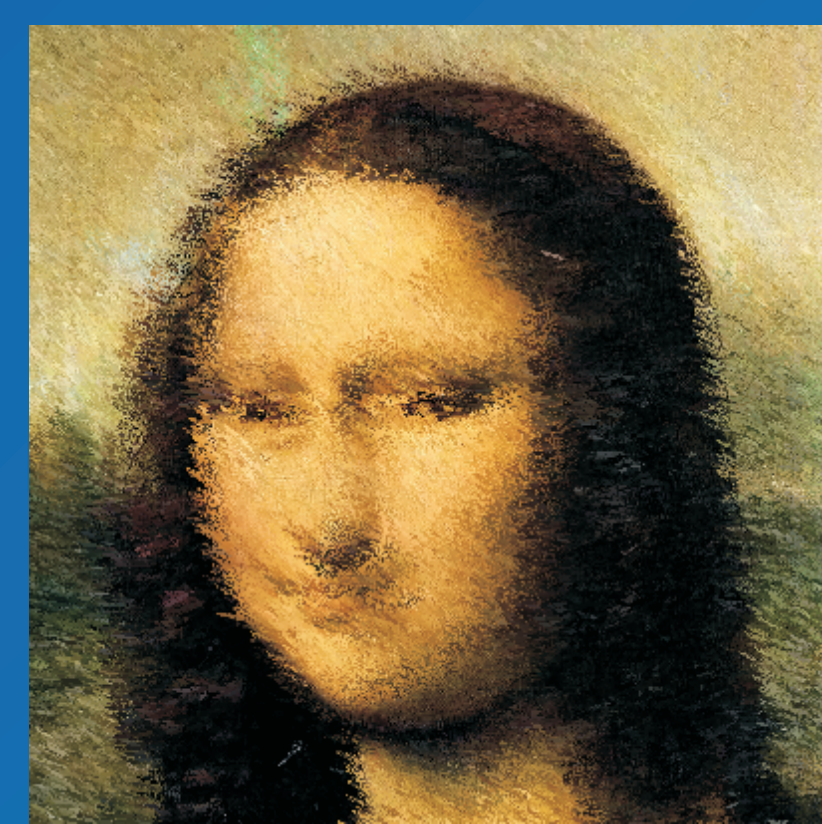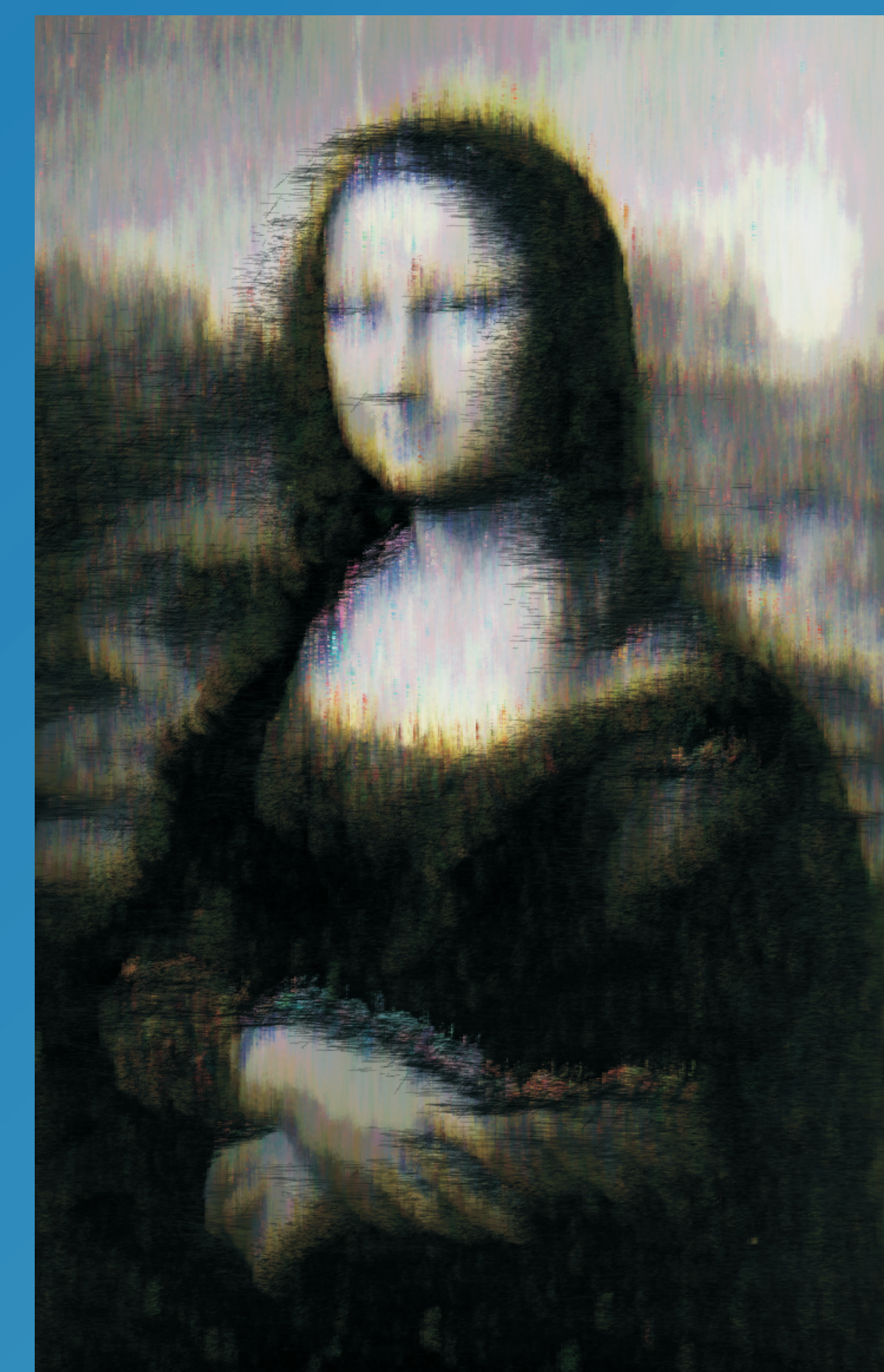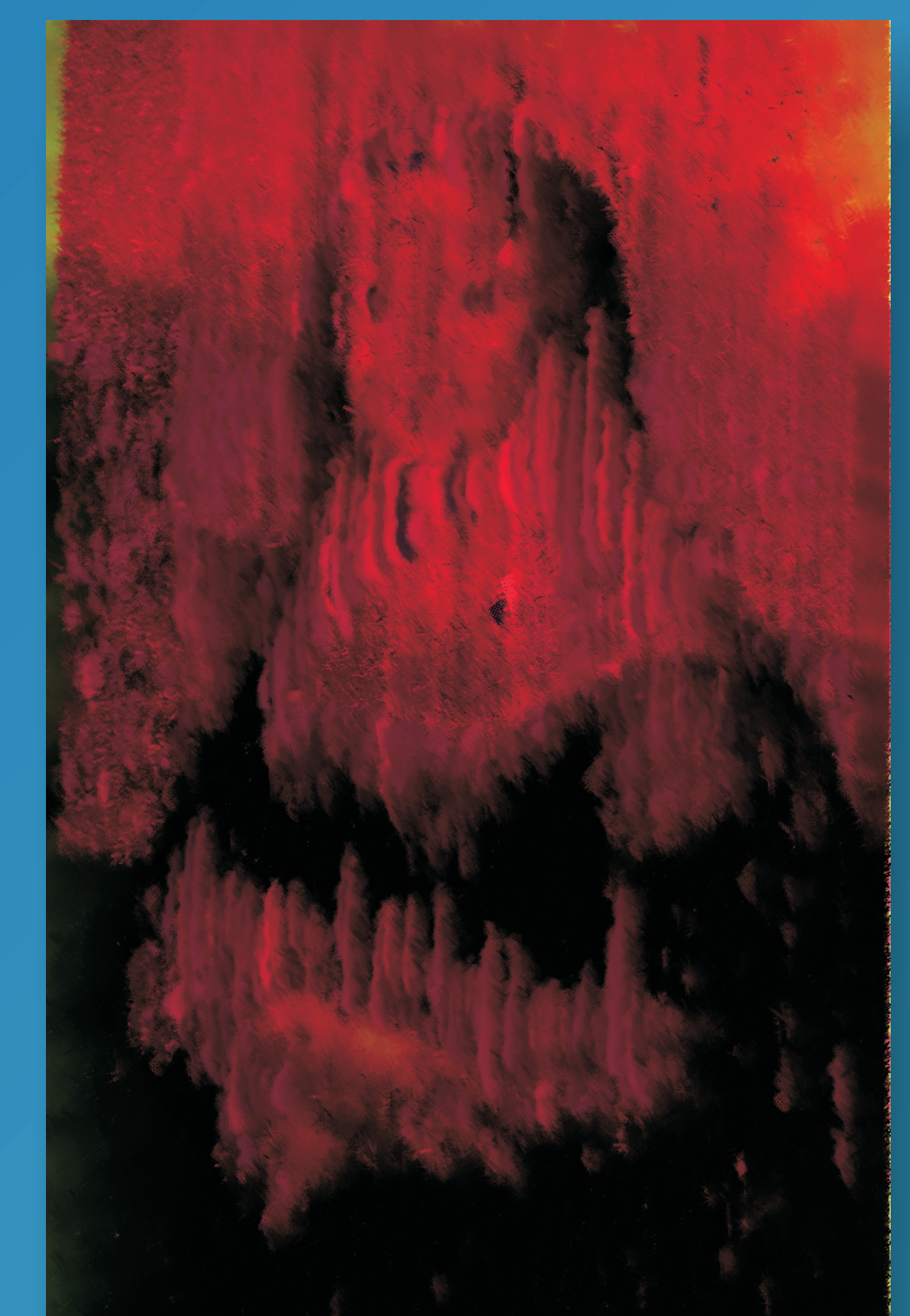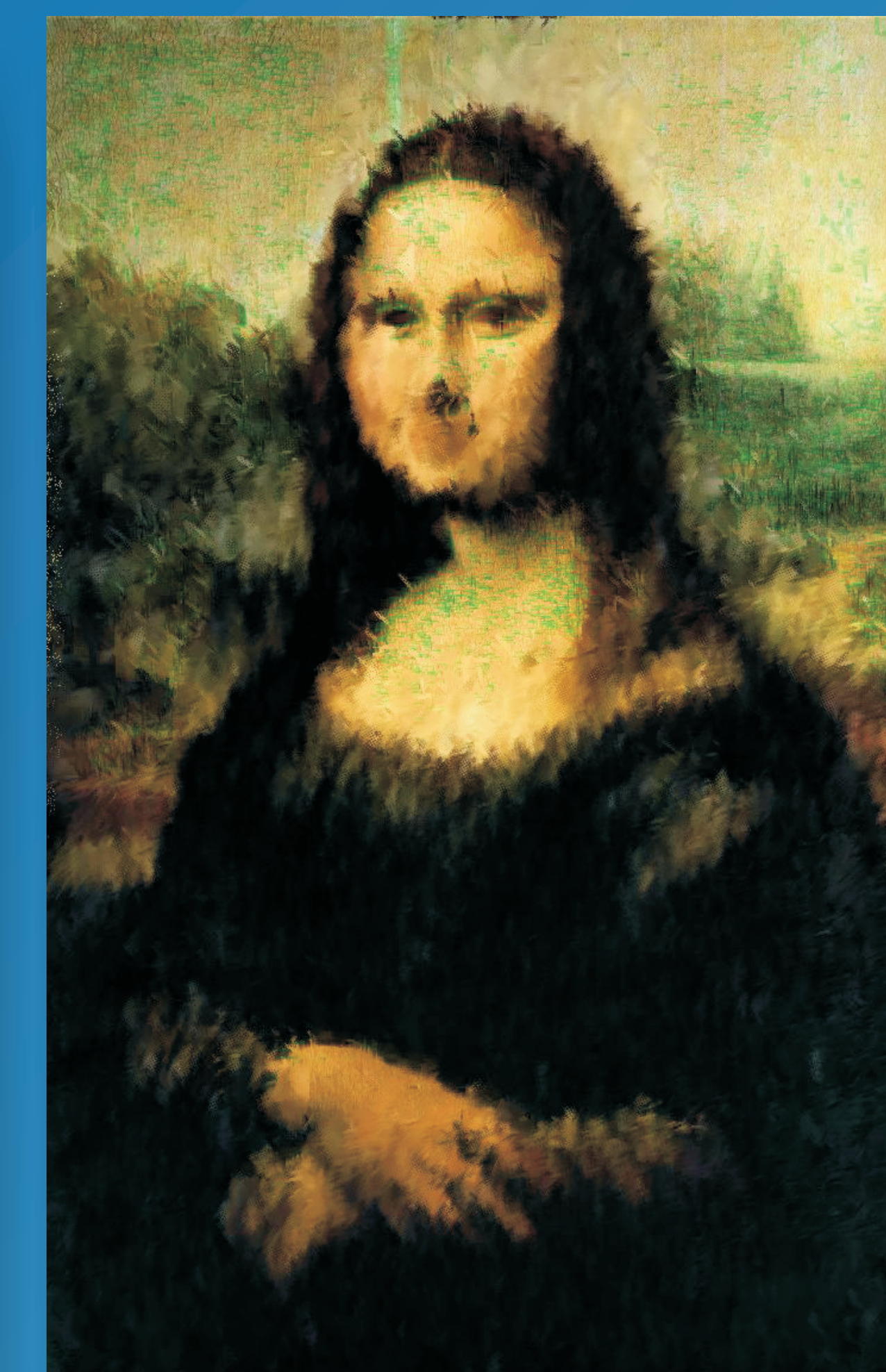
DFN=28.8, mean=4.6, std dev=1.0
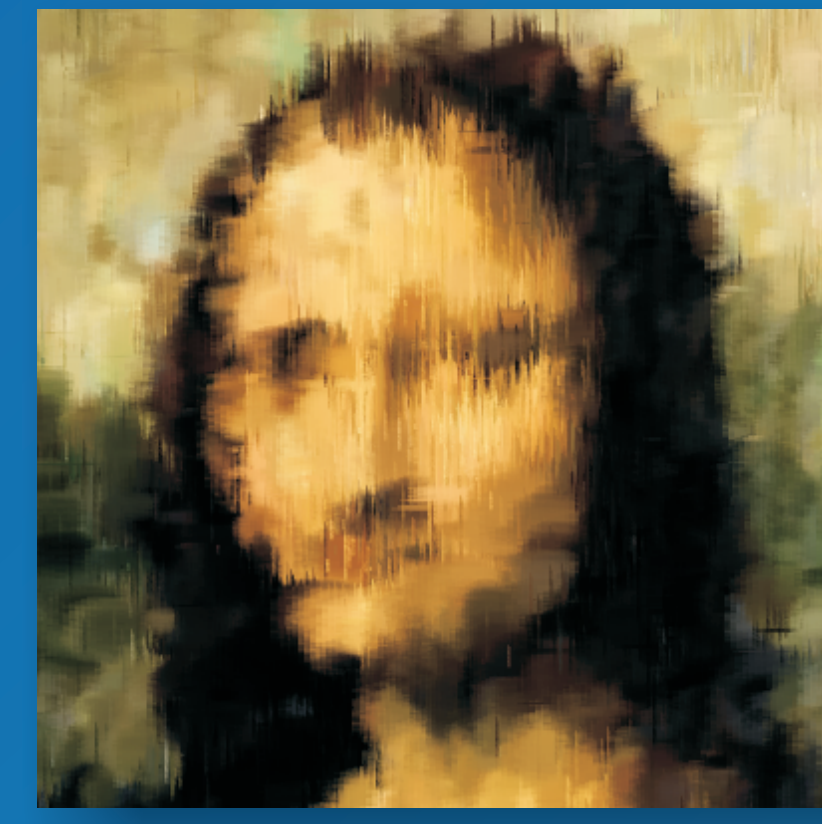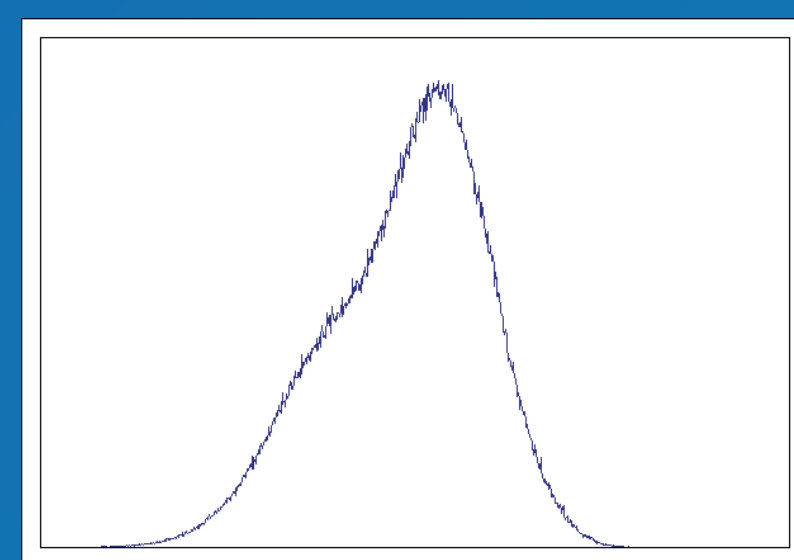
DFN=4.3, mean=4.0, std dev=1.0

Filter Language

Float: source image filter data (Sobel, moment, luminosity), RGB, if-then-else,
    ephem, math ops,...

RGB: move & copy pixels from canvas & source, if-then-else, ephem,
    paint(brush pattern, width, height, angle, delta X, delta Y, R, G, B)

Note: Any evolved float expression can fill each paint argument.

Process

- source image is filtered
- canvas is primed with source
- filter can use source, filter data, canvas
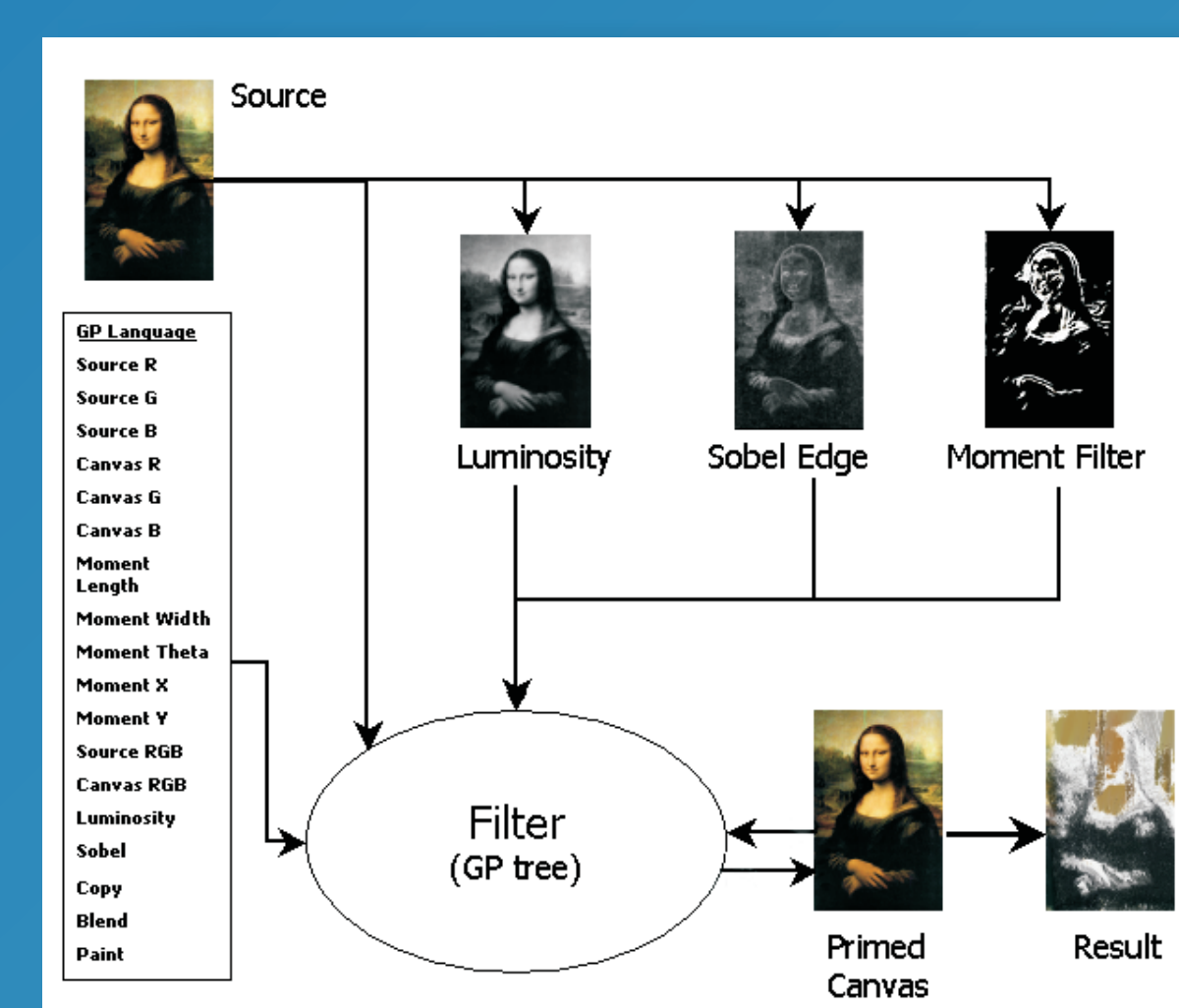
More information

www.cosc.brocku.ca/~bross/ArtFilters/

Source Image