



A short tour of
Animo

Latin:

1st pers. of *animare* “I bring to life”

ablative of *animus* “with intent”

Everything on a slide competes for attention.
Animate what earns it.

Disclaimers

1. Animo is **experimental** and **work in progress**.

API stability is not guaranteed before a 1.0 release.

2. Only the smallest examples are explained with source code in the slides.

The full source code is in `demos/tour.typ` in the Animo Git repository.

The documentation explains every feature in this tour:

<https://reproducible-reporting.github.io/animo/>

3. Prefer Firefox or Chrome for full animation support.

Safari does not animate morphing shape outlines.

Animo will crossfade in Safari instead.

... but you don't have to!

Animations

```
#slide(animation: {  
  import anim: *  
  sub(reveal("first"))  
  sub(reveal("second"))  
  sub(hide("first"), scale("first", f: 2))  
})[  
  = A slide with three "sub"slides  
  
  #tag("first")[Appears first, will go out with a bang.]  
  
  #tag("second")[Appears second and stays.]  
]
```

A slide with three “sub”slides

Appears second and stays.

All the Space You Need

Consider the following fun mathematical problem:

Find three real values, $\{x_1, x_2, x_3\}$, with given population statistics: mean μ , standard deviation σ and skewness γ (if the solution exists).

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Answer

1. Eliminate the mean by writing $u_k = x_k - \mu$. The three given statistics translate into the following equations:

$$\begin{cases} p_1 = u_1 + u_2 + u_3 = 0 \\ p_2 = u_1^2 + u_2^2 + u_3^2 = 3\sigma^2 \\ p_3 = u_1^3 + u_2^3 + u_3^3 = 3\gamma\sigma^3 \end{cases}$$

2. The three unknowns are the roots of a cubic polynomial in t :

$$(t - u_1)(t - u_2)(t - u_3) = t^3 - at^2 + bt - c$$

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3. One can show this by simply constructing the coefficients:

$$a = u_1 + u_2 + u_3 = p_1 = 0$$

$$b = u_1u_2 + u_2u_3 + u_3u_1 = \frac{p_1^2 - p_2}{2} = -\frac{3}{2}\sigma^2$$

$$c = u_1u_2u_3 = \frac{p_1^3}{6} - \frac{p_2p_1}{2} + \frac{p_3}{3} = \frac{p_3}{3} = \gamma\sigma^3$$

4. The polynomial is now known and we just have to solve it:

$$t^3 - \frac{3}{2}\sigma^2 t - \gamma\sigma^3 = 0$$

Note: This equation was derived here from scratch, but mathematicians have names for the trick and the intermediate quantities involved:

- The sums p_1 , p_2 and p_3 of step 1 are the power sums.
- The coefficients a , b and c are the elementary symmetric polynomials of the roots.
- The little computation is referred to as Newton's identities for three variables.

5. Substitute $t = \sqrt{2}\sigma \cos \theta$ and divide by σ^3 . The left-hand side is then the triple angle identity $\cos 3\theta = 4 \cos^3 \theta - 3 \cos \theta$ in disguise:

$$\frac{\sqrt{2}}{2}(4 \cos^3 \theta - 3 \cos \theta) = \gamma \iff \cos 3\theta = \sqrt{2}\gamma$$

6. The cosine takes that value at three angles, one per root:

$$x_k = \mu + \sqrt{2}\sigma \cos \left(\frac{\arccos(\sqrt{2}\gamma) + 2\pi k}{3} \right), \quad k = 0, 1, 2$$

The angle is real only for $|\gamma| \leq \frac{1}{\sqrt{2}}$, and that bound is no accident: it is the largest population skewness three real values can have.

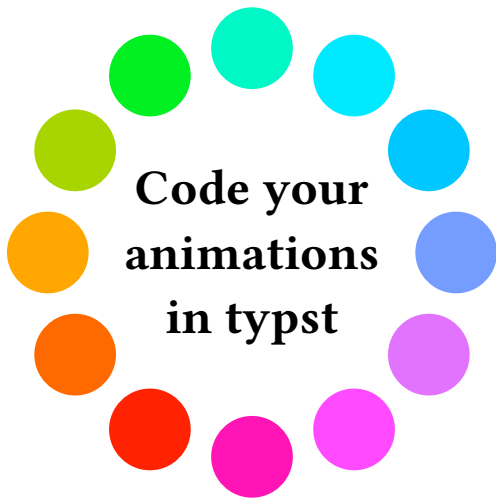
The canvas can extend beyond the viewport.

A slide is a view onto a canvas.

You can pan the viewport to look around.

Anything outside the viewport gets clipped.

Nothing flows onto the next slide.



Space Is Reserved

This sentence contains a `#tag("1")`[hidden] word and ***reserves space*** for it.

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```
#region[
  This sentence contains a #tag("1")[hidden]
  word and will *reflow* because it is *replaced* as a whole.
]
```

This sentence contains a word and will **reflow** because it is **replaced** as a whole.

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`#region[`

This sentence contains a `#tag("1")`[hidden] word and will ***reflow*** because it is ***replaced*** as a whole.

`]`

This sentence contains a hidden word and will **reflow** because it is **replaced** as a whole.

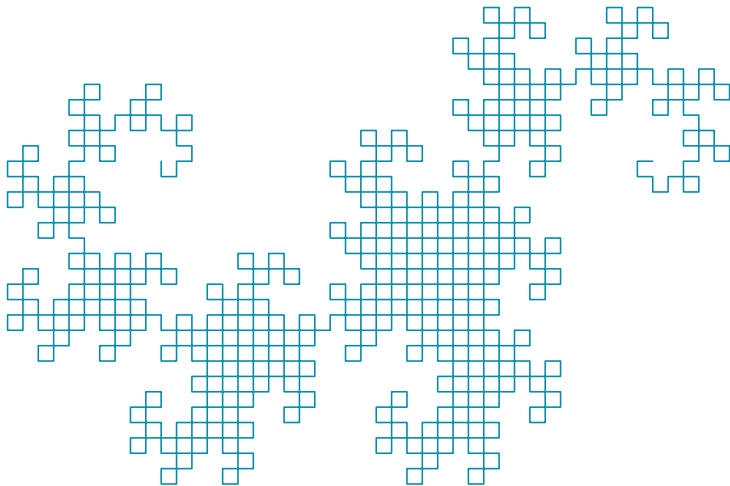
Animated Equations

$$D = \frac{1}{2d} \lim_{f \rightarrow 0} \int_{-\infty}^{\infty} \langle (v)(t) \cdot (v)(0) \rangle e^{i2\pi ft} dt$$

Animated Content Inside a Cetz Figure



Here Be (Morphing) Dragons



Timer controls (in HTML)

1. **wait:** on a **sub** or on **init** autoplays its animation after waiting the given number of seconds.
2. **hold:** on a **sub** or on **init** has the same autoplay effect on the **next** (sub)slide.
3. **delay:** delays an animation primitive, e.g. **reveal**, **move**, **scale**, etc.

This sentence was shown with 0.3 seconds of delay.

4. **duration:** controls the speed of an animation primitive. (This item had a **duration** of 1 second.)

A presenter can always step ahead of a timer.

Travelling back plays the deck backwards, and **Space** stops it where it is.

Output Types

1

HTML presentation

The animated deck

To be presented with
a browser

2

Static presentation

One page per step

For a venue without a
browser

3

Static handouts

One page per slide

For printing or
distributing

The two static types are paged modes

This copy of the deck was compiled as `handout`, and can be exported to PDF, SVG or PNG.

Whenever your present ...
... present *Animo*.

Thank you for watching!