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 strictly guaranteed before a 1.0 release, but no major breaking changes are planned.

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

   The full source code of this deck can be found in `examples/tour.typ` in the Animo Git repository.

… 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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The solution

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:

$$\frac{\sqrt{2}}{2}\left(4\cos^3\theta - 3\cos\theta\right) = \gamma \quad\Longleftrightarrow\quad \cos 3\theta = \sqrt{2}\gamma$$

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

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

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

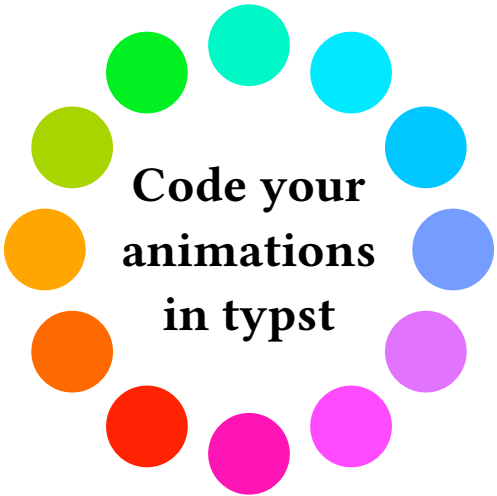
The canvas can extend beyond the viewport.

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.


Code your
animations
in typst

Space Is Reserved

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

This sentence contains a word and **reserves space** for it.

```
#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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This sentence contains a hidden word and **reserves space** for it.

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Animated Equations

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

Animated Content Inside a Cetz Figure

Timer controls (in HTML)

1. `wait:` on a `sub` or on a `#slide` autoplays its animation after waiting the given number of seconds.
2. `hold:` on a `sub` or on a `#slide` 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 and can be exported to PDF, SVG or PNG.

Whenever your present …

… present *Animo*.

Thank you for watching!