Time

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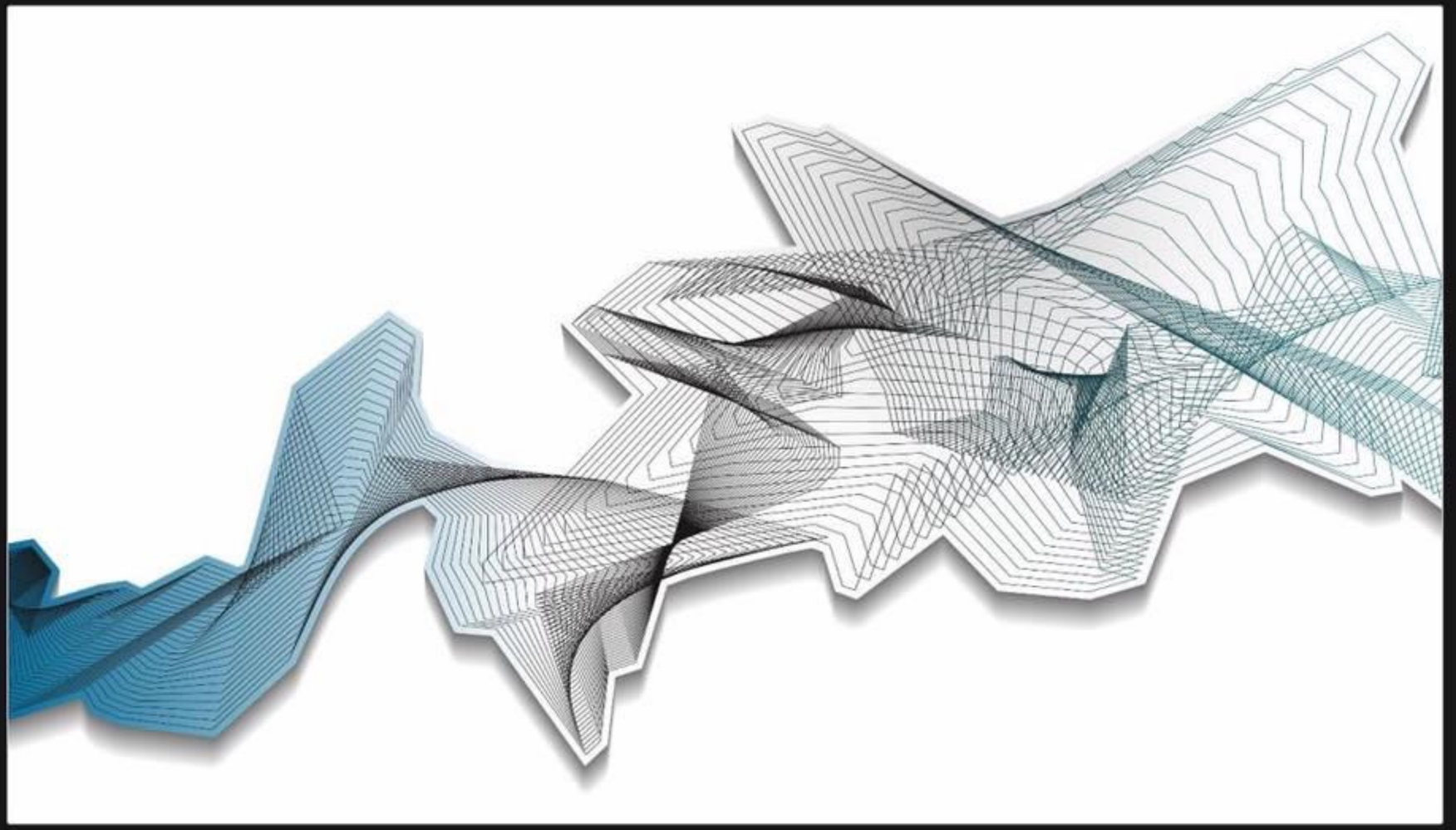
Leerdoelen les 3

- Leren toepassen van visualisatie principes
- Omgaan met venv, pdm, path, scripts, git
- Werken met timestamps
- Autocorrelation (statsmodels)
- Seasonal decompose (Trend, Seasonal, Residu)
- Fourier transforms: the main idea
- Using Fourier transforms to model timeseries

- Python
  - Pandas .dt (isoweek, date, day_name, see docs for more)
  - Pandas reindex
  - Seaborn FacetGrid
  - Seaborn .map
  - Plotly px.area
  - Statsmodels acf, seasonal_decompose
  - scipy.fft, scipy.signal

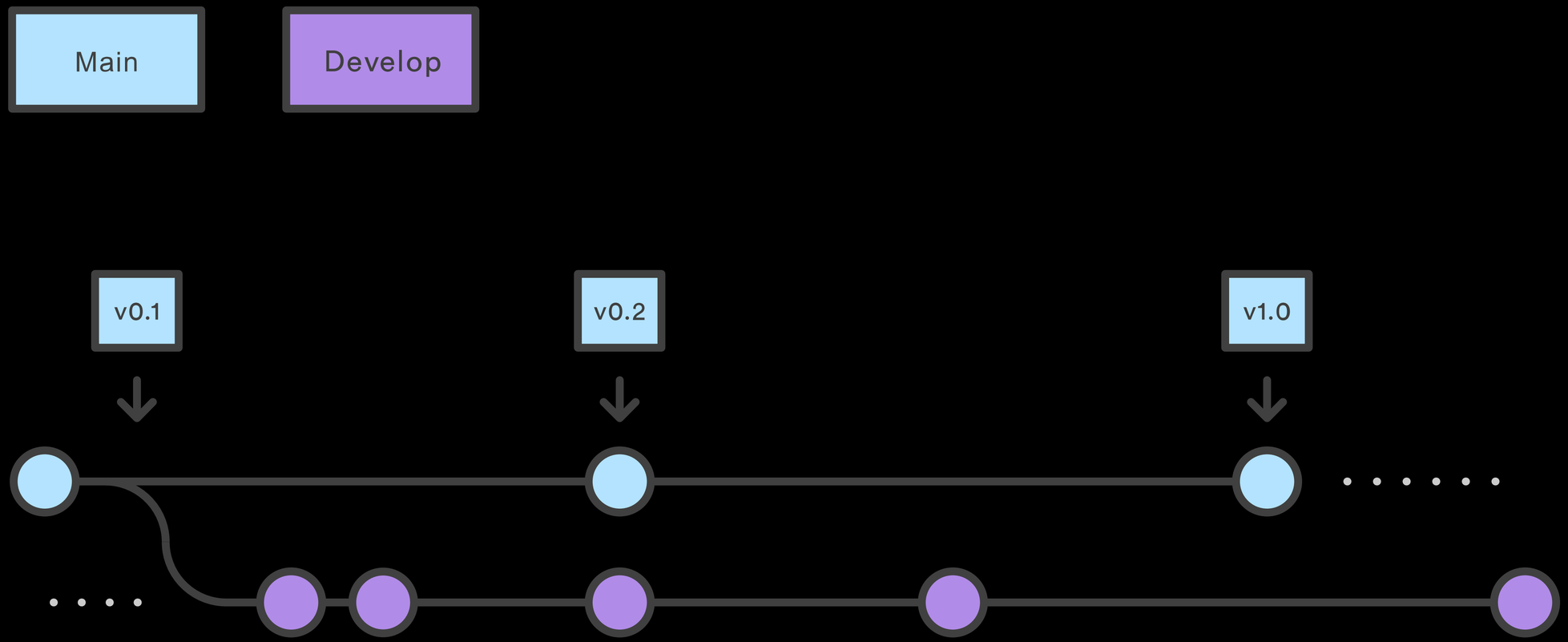
Git

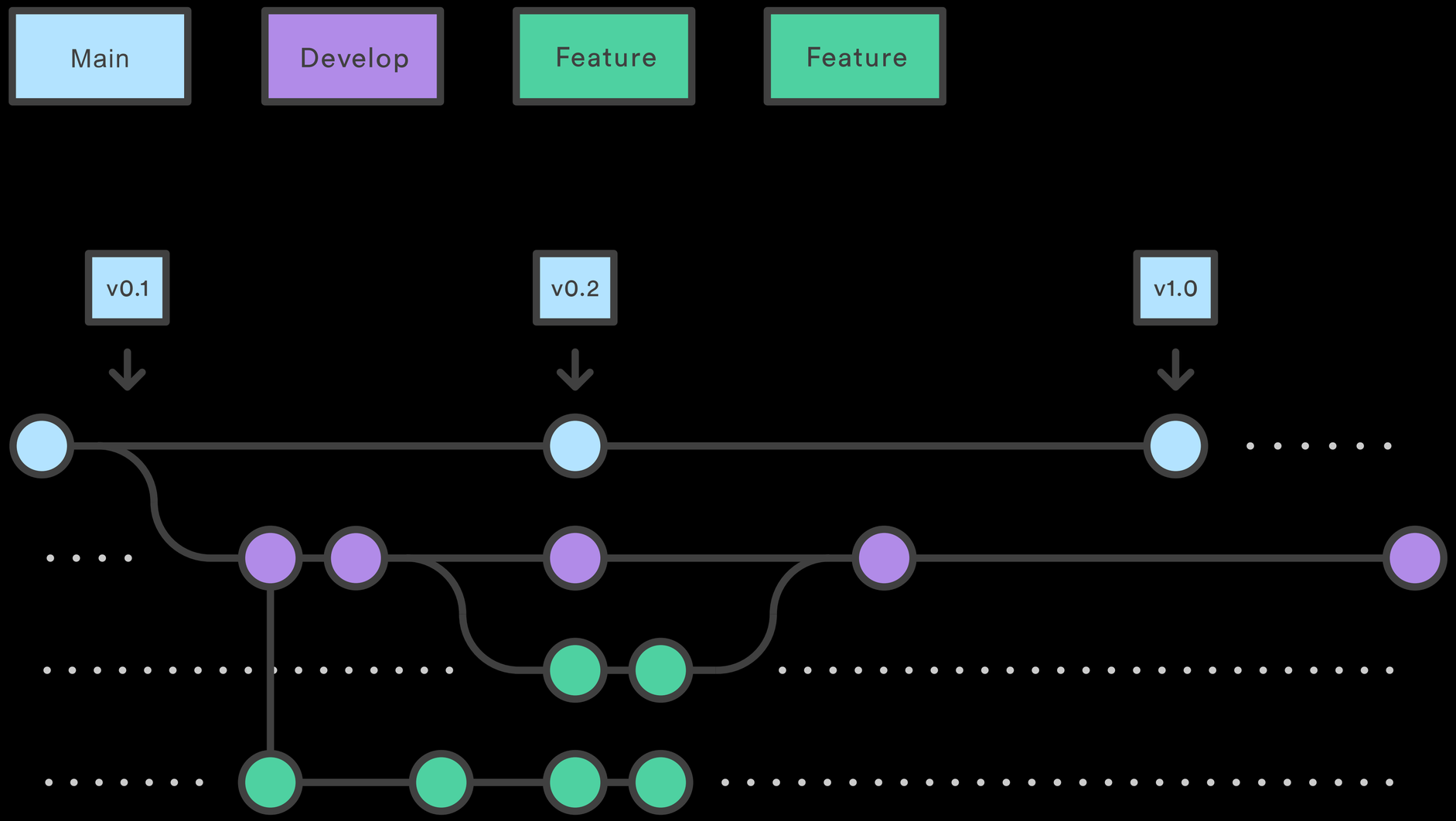
- The only sane way to work together on code
- https://learngitbranching.js.org/

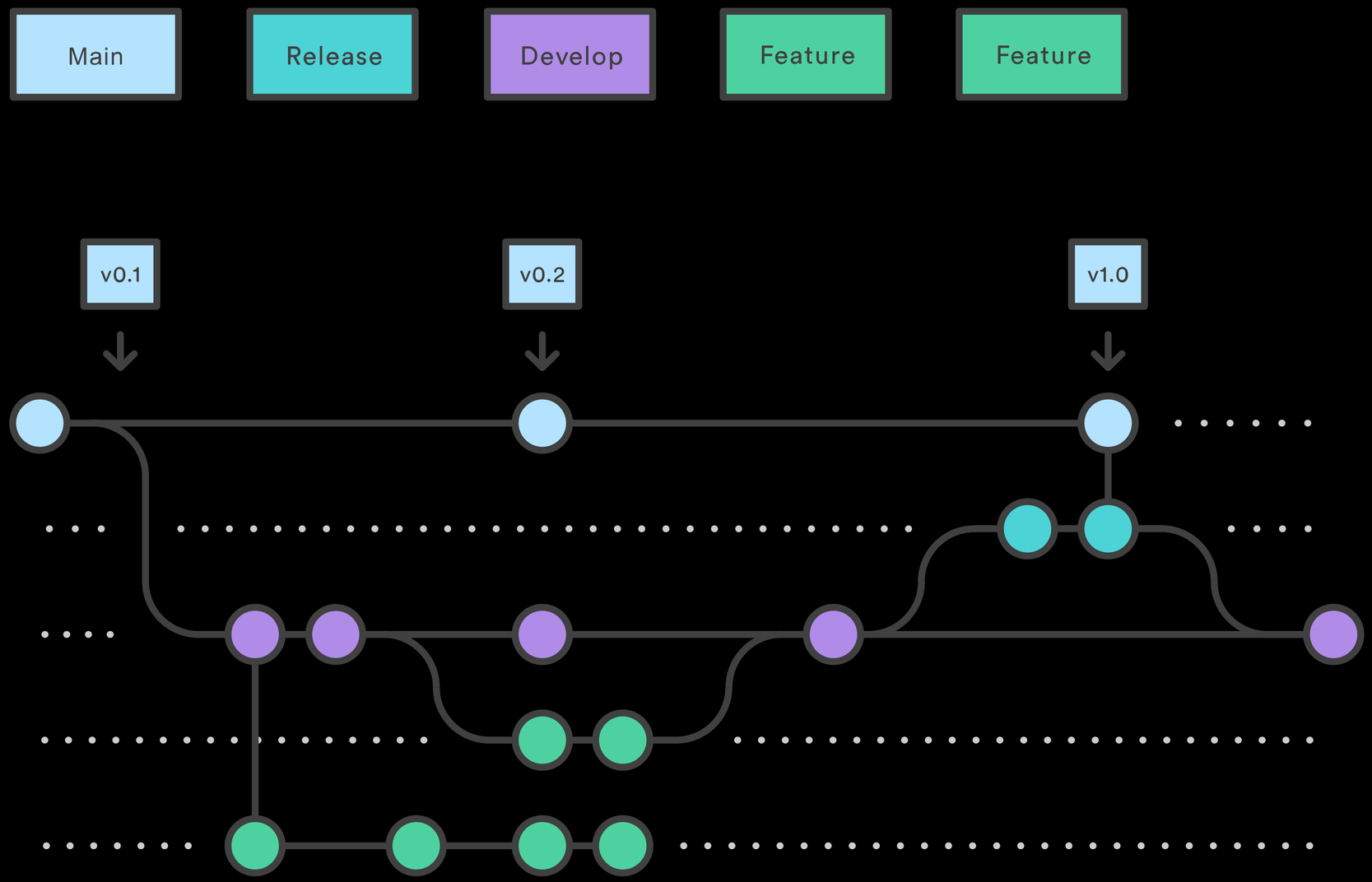


Version Control

Git gets easier once you get the basic idea that branches are homeomorphic endofunctors mapping submanifolds of a Hilbert space.


Main
Develop
v0.1
v0.2
v1.0


Main
Develop
Feature
Feature
v0.1
v0.2
v1.0

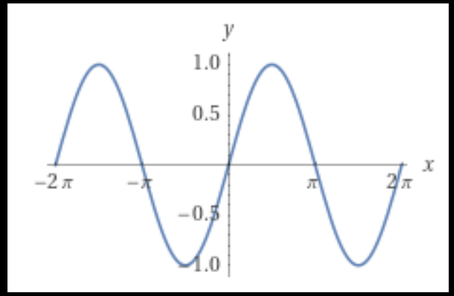

Main
Release
Develop
Feature
Feature
v0.1
v0.2
v1.0

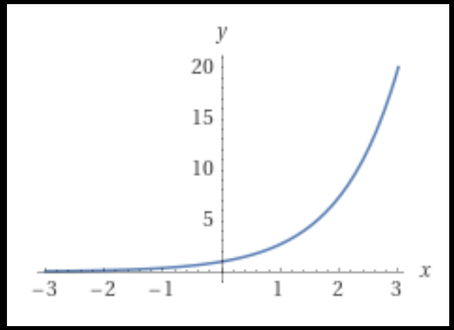
The four horsemen of modelling

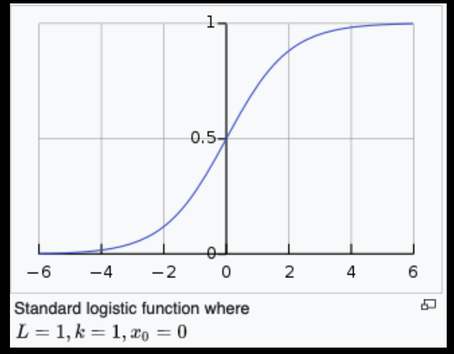
- Linear
- Sine
- Logistic
- Exponential

The four horsemen of modelling

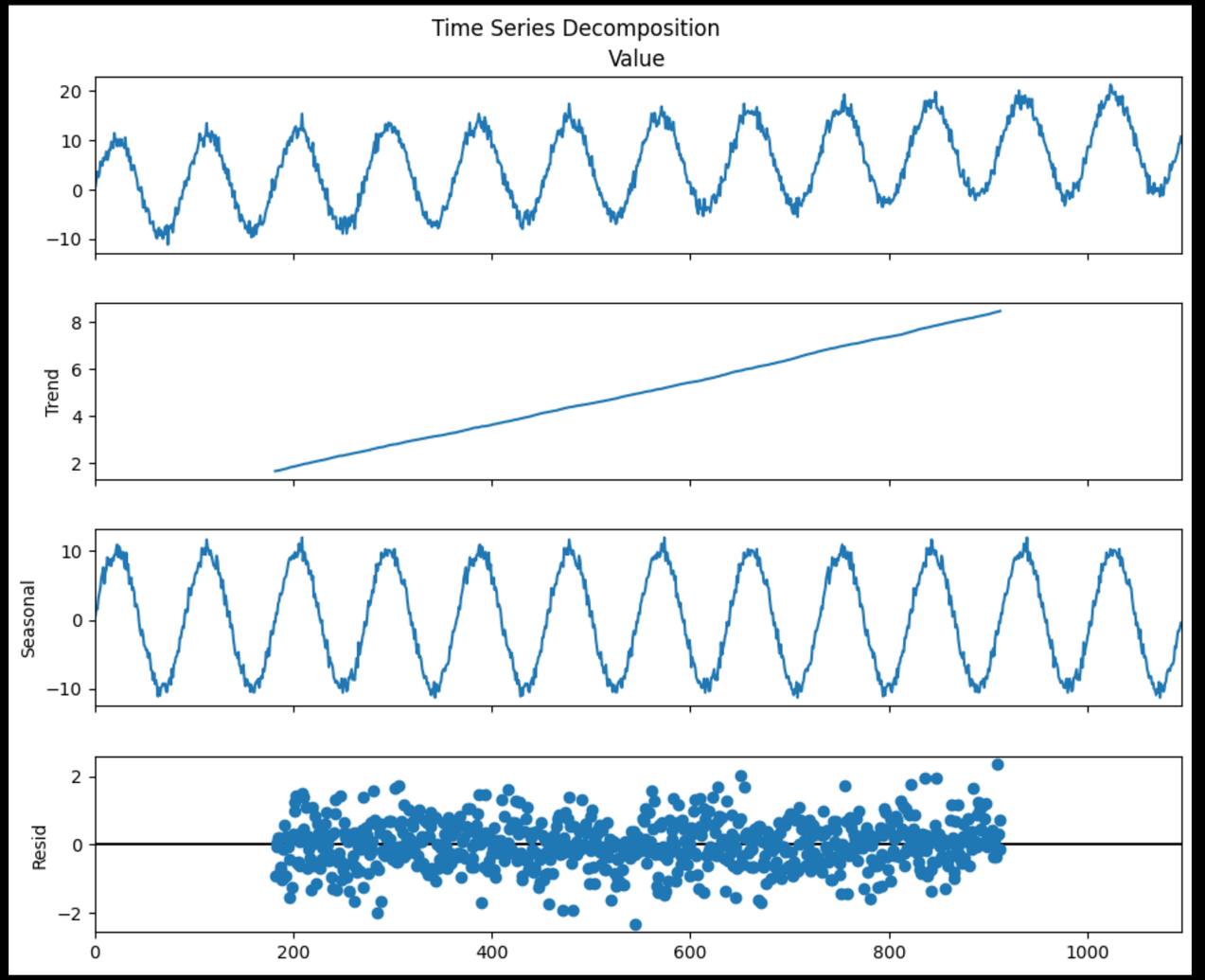
- Linear: $f(X) = WX + b$
- Sine: $f(t) = A \cdot \sin(\omega t + \phi)$ with A for amplitude, ω for angular frequency (radians/sec), and ϕ for phase shift with $0 \leq \phi \leq 2\pi$
- Exponential: $f(x) = e^x$
- Logistic: $f(x) = \dfrac{L}{1 + e^{-k(x-x_0)}}$ with L max value, k growth rate and x_0 midpoint



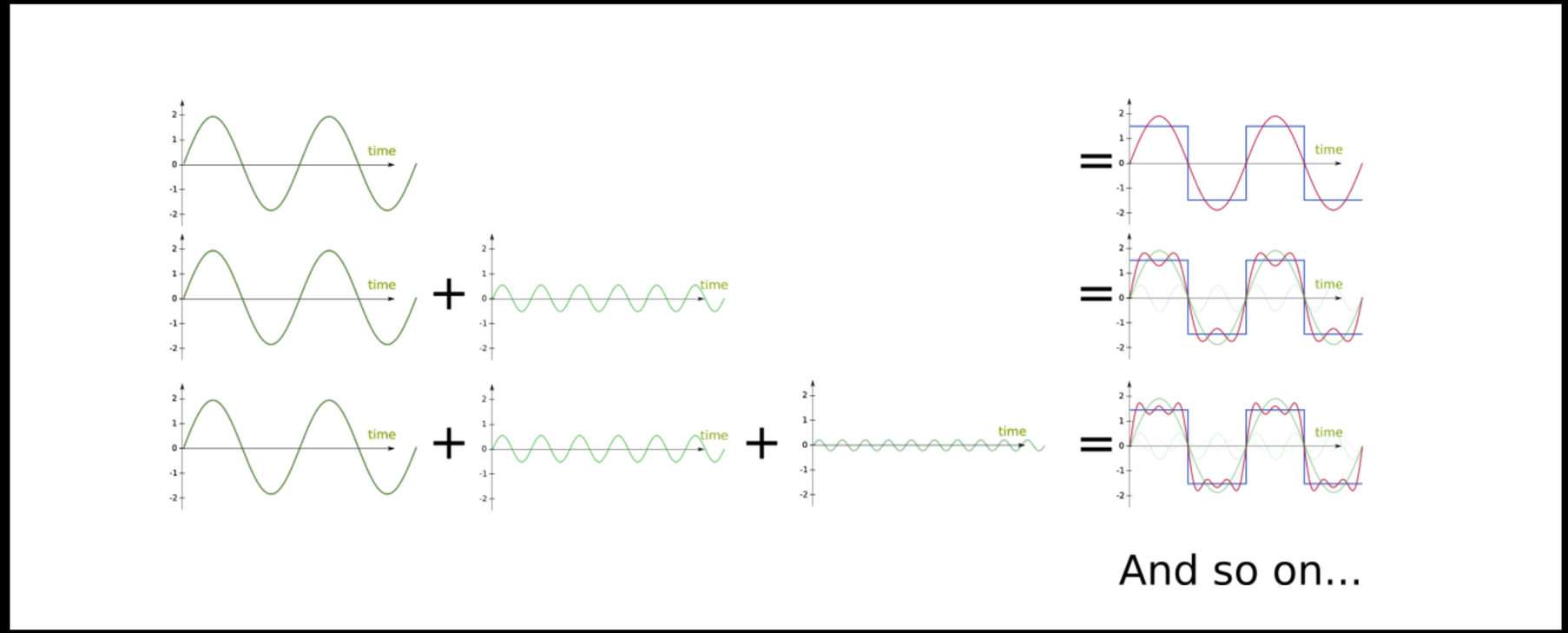




Timeseries decomposition



Fourier Transforms



Fourier Transforms