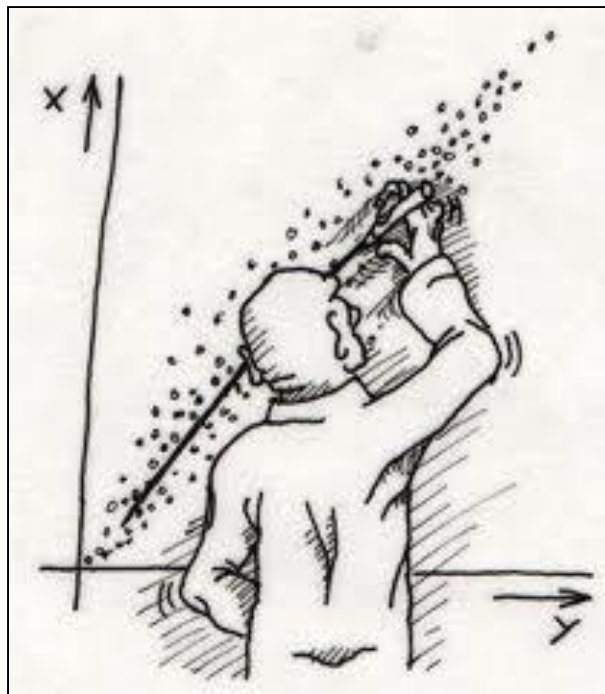


Regression with Machine Learning

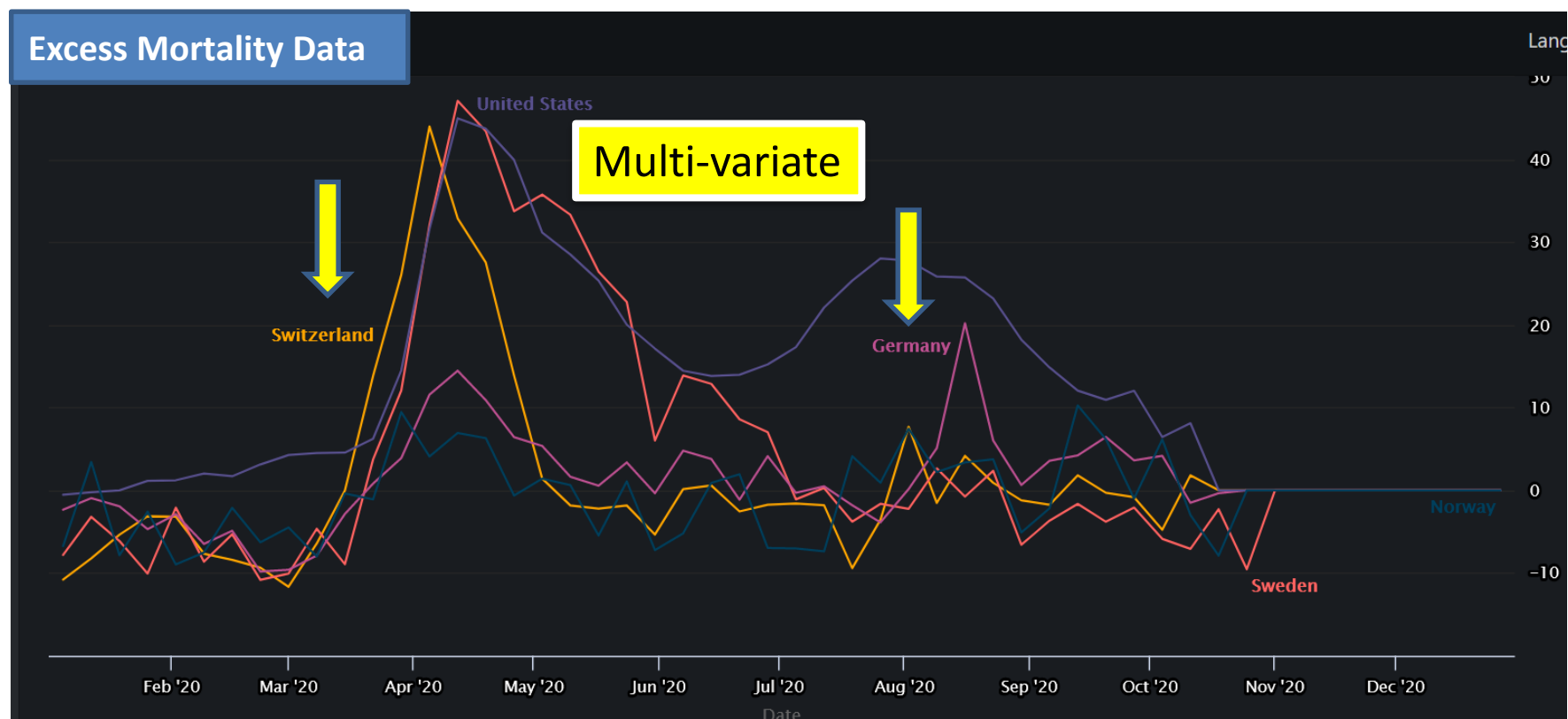
What is regression?



A measure of the relationship between one variable (the output) and another set of variables (the input)

Examples of regressive models

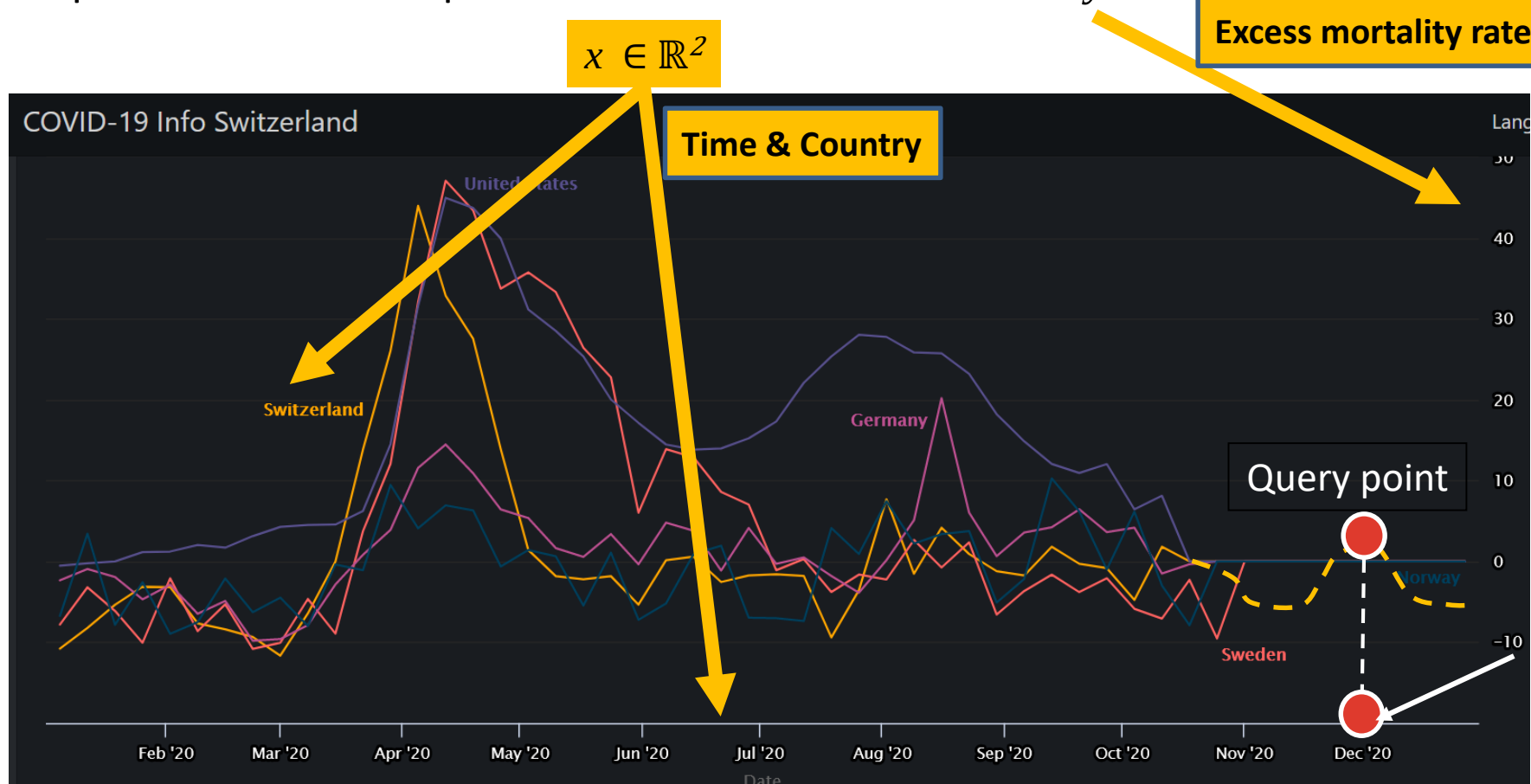
Forecasting Covid-19 (corona-data)



Non-linear Regression

Examples of regressive models

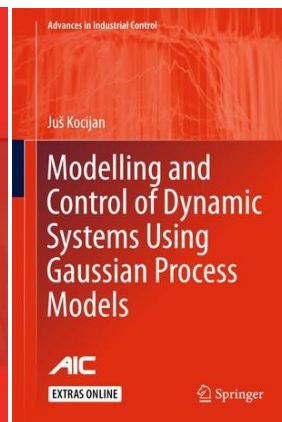
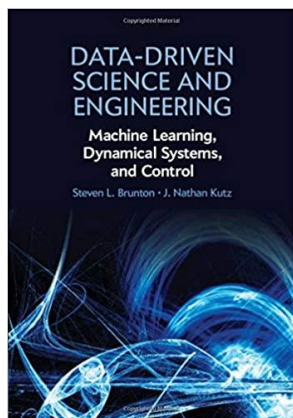
Maps N-dimensional input $x \in \mathbb{R}^N$ to **continuous** values $y \in \mathbb{R}$



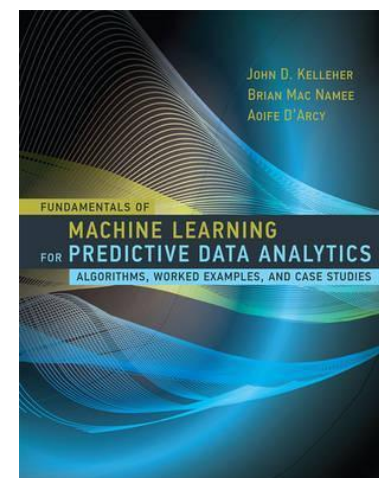
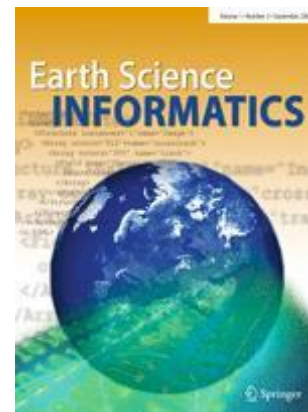
Non-linear, Multi-variate Regression

Non-Linear Regression Useful for What?

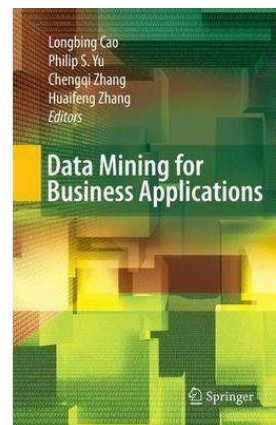
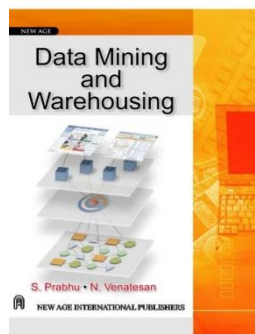
Control



Forecasting



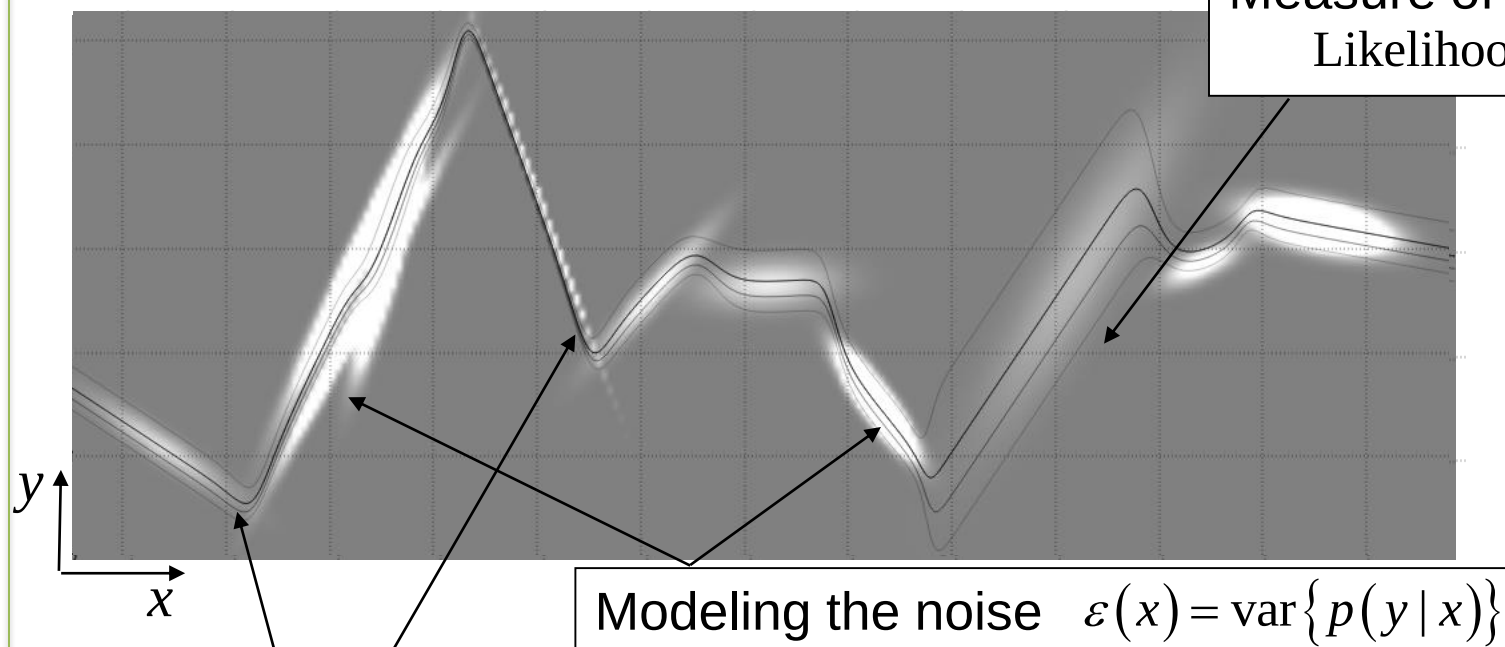
Optimizing



Machine Learning for Regression

Modeling Non-Linear Processes

Learn a function $f : \mathbb{R}^N \rightarrow \mathbb{R}$ and $y = f(x)$.



Capturing the trend
 $y = f(x) = E\{p(y | x)\}$

- Complex temporal data
- Trends with variable time-windows
- High signal-noise ratio
- Biased noise

Regression Algorithms in this Course

