

Title

The discovery of something fantastic

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Abstract

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Keywords

Glossary

Background

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Materials & Methods

We want to cite our important methods (Friedman et al. (2010), Simon et al. (2011), Friedman et al. (2001)).

Important calculations were involved:

One generally accepted definition for $\mathbb{P}(B) \neq 0$ is

$$\mathbb{P}(A | B) = \frac{\mathbb{P}(A \cap B)}{\mathbb{P}(B)}.$$

If we had n conditions, we could suppose that $\bigcup_{i=1}^{\infty} A_i = A$, where A_1, A_2, \dots is a partition of an event A , and

$$\mathbb{P}(A_i | B_1 \cap B_2 \cap \dots \cap B_n) = \frac{\mathbb{P}(A_i \cap B_1 \cap B_2 \cap \dots \cap B_n)}{\mathbb{P}(B_1 \cap B_2 \cap \dots \cap B_n)} = \frac{\mathbb{P}(B_1 \cap B_2 \cap \dots \cap B_n | A_i) \mathbb{P}(A_i)}{\sum_{A_i \subseteq A} \mathbb{P}(B_1 \cap B_2 \cap \dots \cap B_n | A_i) \mathbb{P}(A_i)}.$$

Theorem. Euler's summation formula. *If f has a continuous derivative f' on the interval $[y, x]$, where $0 < y < x$, then*

$$\begin{aligned} \sum_{y < n \leq x} f(n) &= \int_y^x f(t) dt + \int_y^x (t - [t]) f'(t) dt \\ &\quad + f(x)([x] - x) - f(y)([y] - y). \end{aligned} \tag{1}$$

Proof. Let $m = [y]$, $k = [x]$. For integers n and $n - 1$ in $[y, x]$ we have

$$\begin{aligned}\int_{n-1}^n [t]f'(t)dt &= \int_{n-1}^n f'(t)dt \\ &= (n-1)(f(n) - f(n-1)) \\ &= (nf(n) - (n-1)f(n-1)) - f(n).\end{aligned}$$

Summing from $n = m + 1$ to $n = k$ we find

$$\begin{aligned}\int_m^k [t]f'(t)dt &= \sum_{n=m+1}^k (nf(n) - (n-1)f(n-1)) - \sum_{y < n \leq x} f(n) \\ &= kf(k) - mf(m) - \sum_{y < n \leq x} f(n).\end{aligned}$$

Hence,

$$\begin{aligned}\sum_{y < n \leq x} f(n) &= - \int_m^k [t]f'(t)dt + kf(k) - mf(m) \\ &= - \int_y^x [t]f'(t)dt + kf(x) - mf(y).\end{aligned}\tag{2}$$

Integration by parts gives us

$$\int_y^x f(t)dt = xf(x) - yf(y) - \int_y^x tf'(t)dt.$$

When this is combined with (2) we obtain (1).

Results

We applied some cool tech to discover the following awesomeness (LeCun et al. (2015), Shendure et al. (2017)).

Key findings are highlighted in red below (Fig. 1).

Discussion

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Appendix

Acknowledgments

Thanks to R (R Core Team (2017), Wickham (2014))!

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Tables

Figures

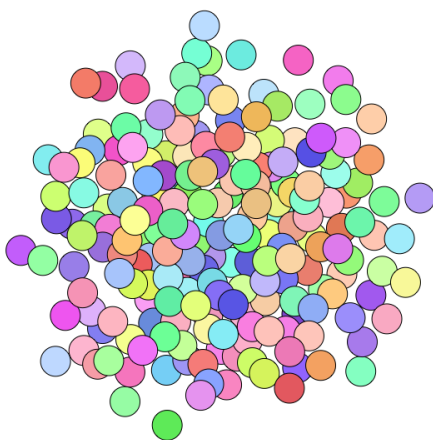


Figure 1: My caption: Easy-to-spot trend presented.