Posterior Probability Definition

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What Is a Posterior Probability?

A posterior probability, in Bayesian statistics, is the revised or updated probability of an event occurring after taking into consideration new information. The posterior probability is calculated by updating the prior probability using Bayes' theorem. In statistical terms, the posterior probability is the probability of event A occurring given that event B has occurred.

KEY TAKEAWAYS

- A posterior probability, in Bayesian statistics, is the revised or updated probability of an event occurring after taking into consideration new information.
- The posterior probability is calculated by updating the prior probability using Bayes' theorem.
- In statistical terms, the posterior probability is the probability of event A occurring given that event B has occurred.

Bayes' Theorem Formula

The formula to calculate a posterior probability of A occurring given that B occurred:

where:

$A, B = \text{Events}$

$P(B \mid A) = \text{The probability of B occurring given that A is true}$

$P(A) \text{ and } P(B) = \text{The probabilities of A occurring and B occurring independently of each other}$

The posterior probability is thus the resulting distribution, P(A|B).

What Does a Posterior Probability Tell You?

Bayes' theorem can be used in many applications, such as medicine, finance, and economics. In finance, Bayes' theorem can be used to update a previous belief once new information is obtained. Prior probability represents what is originally believed before new evidence is introduced, and posterior probability takes this new information into account.

Posterior probability distributions should be a better reflection of the underlying truth of a data generating process than the prior probability since the posterior included more information. A posterior probability can subsequently become a prior for a new updated posterior probability as new information arises and is incorporated into the analysis.

Related Terms

Prior Probability

A prior probability, in Bayesian statistical inference, is the probability of an event based on established knowledge, before empirical data is collected. more

Conditional Probability

Conditional probability is the likelihood of an event or outcome occurring based on the occurrence of some other previous event or outcome. more

Bayes' Theorem Definition

Bayes' theorem is a mathematical formula for determining conditional probability of an event. Learn how to calculate Bayes' theorem and see examples. more

a sample of possible outcomes. more

Credibility Theory

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