The *t*-test

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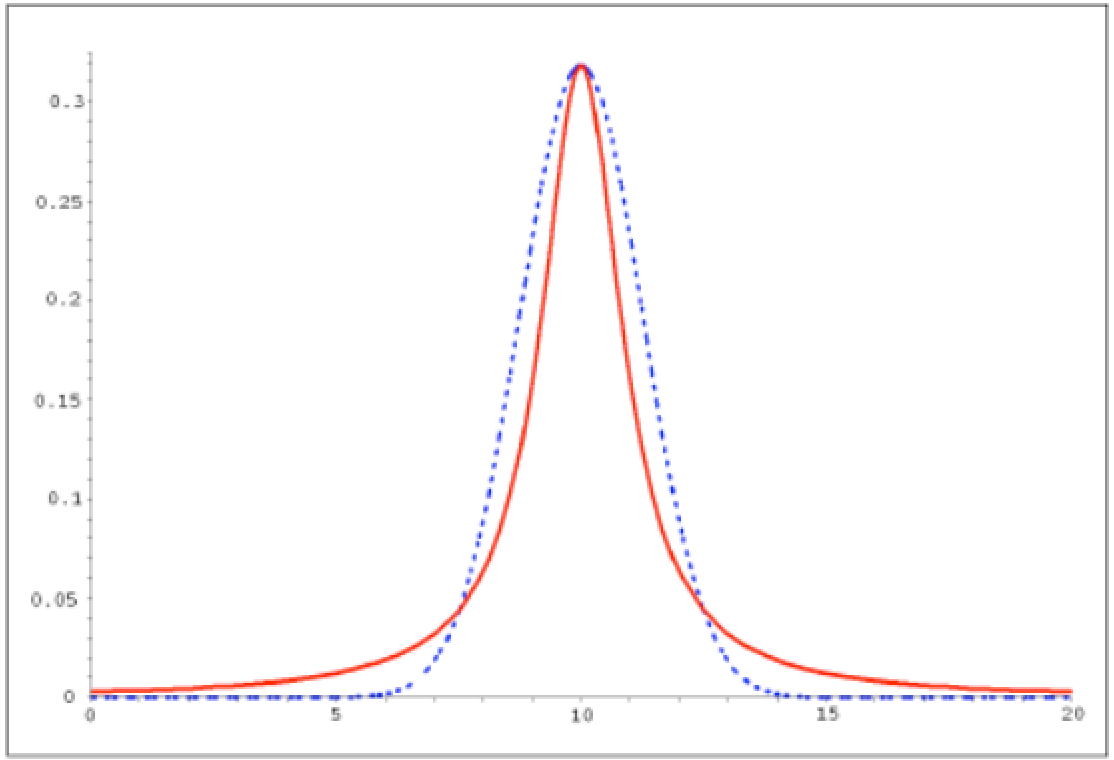
Multivariate statistics @ ELTE

The *t* distribution

- Determine if a sample is from the hypothetical population



Mean (μ) – the location of the peak
Variance (σ) – the width of the peak
Degrees of freedom (v) – the *n - 1*

The significance of the *t*-test

- In the Cauchy the Mean and the variance is undefined
- When $v > 2$ the mean is defined but the variance depends on v
- The smaller the *n* the larger the sample variance and the larger the variance of the *t* distribution
- Introducing the effect of sampling and uncertainty

t-test assumptions

- Derive from the definition:
  - Decide if a sample's mean is from a given population with given variance and mean anf of family gaussian

- Normality assumption : it must be approximated well with a t distribution
- Variance assumption : we are <u>not</u> testing it in the *t* test so it is assumed to be equal

The Bayesian *t*-test

- *T*-Test – P(Data|hypothesis) is our data is from the expected population?
- *Bayes:* P(Hypothesis| data) is it likely to be that population if I collected this data?
  - *Uncertainty already introduced*
  - *B.E.S.T. test: Reallocate probability → Approximate the parameter values*
  - *The Priors have little effect on the Posterior here*
  - *MCMC – potential parameter values, These are approximations*
  - *It return an interval too (95%) to give a more stable estimate*