

Crash Course in Statistics for Neuroscience Center Zurich University of Zurich

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5 $n \rightarrow \infty$: Law of large numbers (LLN; Gesetz der grossen Zahlen)

Further readings: Chapter 5 in Stahel or Chapter 6 in Cartoon Guide

Useful for Estimation, see Chapter 6

Problem: Examine (see p 33)

$$\bar{X} := \frac{1}{n} \sum_{k=1}^n X_k$$

if $n \rightarrow \infty$.

Theorem 5.1 [LLN] $X_i, i \geq 1$, sequence of iid RV's with mean μ (such that $E[|X_1|] < \infty$ (math. technicality)). Then the LLN holds:

$$\bar{X} := \frac{1}{n} \sum_{i=1}^n X_i \rightarrow \mu$$

if $n \rightarrow \infty$.