

Two-level variability - estimation

Tereza Neocleous

We consider transfer evidence obtained at a crime scene (control sample) and from a suspect (recovered sample). It is of interest to assess the uncertainty relating to whether the recovered sample came from the same source as the control sample. The assessment will be based on measurements on several characteristics (multivariate data). Within the context of a two-level random effects model, measures of within and between-object variability (variance components) will be defined, and their estimates obtained using a background population database. The multivariate equivalent of the two-sample t-test, Hotelling's T^2 , will be introduced for the comparison of controlled and recovered samples using significance probabilities. Limitations of use of this method for evidence evaluation will be discussed briefly.