Asymptotics of maximum likelihood estimators based on discrete Type II right censored samples

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The talk will be concerned with maximum likelihood estimation based on Type-II right censored discrete data. During an experiment in which Type-II right censoring is applied n items with independent and identically distributed lifetimes are placed on a test. Due to budget or time limitations or on account of ethical decisions in biomedical problems, the experiment is terminated at the moment of the rth failure, where $r < n$ is fixed in advance.
During the talk I will consider estimation of multivariate unknown parameter of the discrete lifetime of items. I will focus on asymptotic properties of the corresponding maximum likelihood estimators (MLEs). I will study two scenarios: when n tends to infinity while r remains fixed and when n tends to infinity and r varies with n in such a way that r/n is constant. For the two asymptotic scenarios, first I will provide regularity conditions guaranteeing that the MLEs of interest exist almost surely for all sufficiently large n and are strongly consistent. Next, I will give regularity conditions under which the MLEs are asymptotically normally distributed. I will also show general expressions for the covariance matrix of the asymptotic multivariate normal distribution.