

Syllabus for 401-4635-57L
Survival analysis for interval censored data
Fall semester 2007

1 General information

Instructor:	Marloes Maathuis, LEO D 9.2, maathuis@stat.math.ethz.ch
Lectures:	Tuesday 3-5pm, HG E 33.5 (for 6 weeks, starting October 2nd, no class on October 23rd)
Course material:	Class notes and papers
Class website:	http://stat.ethz.ch/~maathuis/teaching/fall07
Grading:	Oral exams

2 Course description

Right-censored failure time data has been studied extensively in the last decades. A more recent topic of study is the analysis of interval-censored data. The interest in this type of data is partly driven by the HIV/AIDS epidemic, since the time of HIV infection is typically interval censored: we often cannot observe the time of infection directly, and only know that it lies in the time interval between someone's last negative and first positive HIV test.

In this class we study nonparametric estimation for univariate and multivariate interval censored data, paying special attention to the nonparametric maximum likelihood estimator (MLE). Topics include: definition and characterization of the estimators; existence and uniqueness properties; computational algorithms; and large sample properties such as (in)consistency, rates of convergence and limiting distributions.

The analysis of interval censored data is often more challenging than the analysis of right censored data. The large sample behavior of the MLEs in both cases is also fundamentally different, with different rates of convergence and different limiting distributions. We will pay special attention to these differences and discuss the underlying reasons.

3 Tentative schedule

In the first two weeks I plan to give examples of different types of censored data, derive the likelihood in these various cases, and describe general properties of the MLE for censored data.

In the remaining part of the course, we will discuss two types of censored data in more detail: right censored data (week 3) and current status data (week 4-6). Current status censoring is the simplest form of interval censoring, and we will see that this form of censoring is fundamentally different from right censoring.