Einladung zum
Mathematischen Kolloquium

Am Dienstag, 17. November 2015 spricht Herr

Univ.-Prof. Mag. Dr. Andreas Futschik
(Institut für Angewandte Statistik, Johannes Kepler Universität Linz)

„On the inadmissibility of common population genetic estimates
and their improvement by using shrinkage”

Abstract:
Two key parameters in population genetics are the scaled mutation parameter theta and the scaled recombination rate rho. Estimates of these parameters have been obtained either from suitable summary statistics, or via more sophisticated methods such as maximum (composite) likelihood. We show that there is often room for uniform improvement of these estimates.

We first explain why the popular Ewens-Watterson estimate of theta is inadmissible in terms of the mean squared error under the classical Wright-Fisher model and how it can be uniformly improved. Also other estimates of theta such as the MLE can be improved, although to a smaller extent.

Then we look at estimating the scaled recombination rate rho, and explore possible gains that can be obtained with the two popular (approximate) Bayesian estimates LDhat and LDhelmet. It turns out that there is often still room for uniform improvement. This may be surprising, as it is well known that Bayesian estimates are admissible under weak assumptions.

Both for Wattersons estimate and when estimating recombination, the improvement can be achieved without a lot of computational effort. However, as no explicit formulas for bias and variance are available when estimating rho, the coefficients turning up in the improvement need to be estimated from simulations.

The talk will start with a short introduction into population genetics, the Wright-Fisher-Model and the other mentioned statistical methods.

(Einladungsvorschlag von Herrn Werner Brannath)

Der Vortrag findet statt am Dienstag, 17. November 2015 um 16 Uhr c.t.
im Raum 1090, 1. Ebene des Mehrzweckhochhauses (MZH) der Universität Bremen,
Bibliothekstraße, 28359 Bremen.

Zuvor (ab 16.00 Uhr) gibt es Kaffee/Tee und Gebäck im Raum MZH 7260.

Alle Interessierten sind herzlich willkommen.
R.-E. Hoffmann als Kolloquiums-Beauftragter.
08.11.2015