Einladung zum ZeSOB Kolloquium

Am Montag, **16. Januar 2017, um 16:00 c.t.** spricht Herr

Prof. Ernst Wit

(Universität Groningen, Niederlande)

über

High-dimensional graphical models with applications to genetics

Recombinant Inbred Lines (RILs) derived from divergent parental lines can display extensive segregation distortion and long-range linkage disequilibrium (LD) between distant loci on same or different chromosomes. These genomic signatures are consistent with epistatic selection having acted on entire networks of interacting parental alleles during inbreeding. The reconstruction of these interaction networks from observations of pair-wise marker-marker correlations or pair-wise genotype frequency distortions is challenging as multiple testing approaches are under-powered and true long-range LD is difficult to distinguish from drift, particularly in small RIL panels.

Here we develop an efficient method for reconstructing an underlying network of genomic signatures of high-dimensional epistatic selection from multi-locus genotype data. The network captures the conditionally dependent short- and long-range LD structure of RIL genomes and thus reveals "aberrant" marker-marker associations that are due to epistatic selection rather than gametic linkage.

The network estimation relies on penalized Gaussian copula graphical models, which accounts for large number of markers p and small number of individuals n. A multi-core implementation of our algorithm makes it feasible to estimate the graph in high-dimensions (max markers ~ 3000). We demonstrate the efficiency of the proposed method on simulated datasets as well as on genotyping data in Thaliana and Maize. We show extensions of this method can also be used for genetic map reconstruction. This is joint work with Pariya Behrouzi.

Der Vortrag findet statt am Montag, 15. Januar 2017, um 16 Uhr c.t. im Seminarraum des KKSB an der Universität Bremen, Linzer Straße 4, 28359 Bremen.

Alle Interessierten sind herzlich willkommen!

(Einladungsvorschlag von Prof. Dr. Werner Brannath)