Presenter: Lasse Fischer

Title: Online multiple testing with FWER control

Abstract:

In online multiple testing an infinite stream of hypotheses is tested in a sequential manner. While online FDR control is studied extensively, there is less work on FWER control in the online setting. In 2021, Tian & Ramdas introduced the Adaptive-Discard-Spending (ADDIS-Spending) as an online procedure with FWER control. In our proposal, we apply the concepts of adaptivity and discarding to the graphical approach by Bretz et al. (2009), resulting in what we call the ADDIS-Graph. Due to its graphical representation the ADDIS-Graph is easy to interpret. Moreover, it leads to power improvements compared to the ADDIS-Spending in case of locally dependent p-values. In addition, we exhaust the significance level under independence of the p-values to obtain uniformly superior ADDIS procedures with theoretical results that are supported by simulations. Furthermore, we formulate a new closure principle for online multiple testing and present a condition under which a closed procedure is indeed an online procedure.

This is joint work with Werner Brannath and Marta Bofill Roig.