Multiple Testing Procedures: Shrinkage and Clustering Aspects

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In the analysis of high-dimensional data, one very common approach has to approach problems from a multiple testing perspective. This has led to a renewed interest in the consideration of multiple comparisons problem, of which there has been an emphasis on procedures that control the false discovery rate. In this talk, we will consider two aspects of the problem. First, we will discuss shrinkage approaches to the multiple testing problem. Advantages of this approach will include insensitivity to dependence, a common problem in genomic settings. Second, we will discuss a reinterpretation of the celebrated Benj amini-Hochberg procedure in terms of a type of clustering problem. This reinterpretation will allow for the development of variations that of the B-H method that have a Bayesian justification as a type of empirical null hypothesis in the sense of Efron. Simulated and real-data examples will be used throughout the talk for illustration.