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Wai Kong J Pang* (wpang@monmouth.edu). *Hypothesis Testings in Hilbert Spaces.*

The one-sample problem will be considered in this talk. Generalization to Euclidean spaces can be obtained by applying Roy's union - intersection principle in combination with the univariate technique; this yields a studentized statistic based on the sample covariance matrix which is referred to as Hotelling's statistic. It will be shown that a further extension to Hilbert spaces along similar lines will break down. One alternative is to project the data on a Euclidean space of sufficiently high dimension and construct a Hotelling T^2 . This procedure leaves the question of how to decide on the dimension open. Another alternative is to regularize the sample covariance operator but this turns out to yield a statistic whose asymptotic distribution depends on the unknown eigenvalues of the population covariance operator. A better alternative regards modifying the hypothesis which will be called the "neighborhood hypothesis". An example of a neighborhood hypothesis would be the assumption that the mean value function is approximately zero, rather than exactly zero. This assumption may not only be more realistic, but the natural test statistic now simply has a normal distribution in the limit and only the variance of this distribution remains to be estimated. (Received February 23, 2010)