



Bioinformatics Research Centre
School of Computer Engineering

Seminar Announcement

“Aspects of inference from transcriptomes”

By

Prof. Mahesan Niranjan

Time: 2.30-3.30pm, (Wednesday) 5 August 2009

Venue: SCE Meeting room, N4-2a-35

Nanyang Technological University, Singapore

All are invited!

Abstract

Microarray studies, measuring the relative abundances of thousands of genes in a biological sample, have attracted the imagination of researchers working in statistical inference. The excitement of the post-genomic era and aspects of this inference problem, such as its high dimensionality, are reasons for this. It is approximately correct to say that there is no inference model or algorithm that has not been applied to such high throughput experimental data, with some performance improvement over competing techniques. Further, mRNA levels measured in transcriptomes are often seen as proxies for the corresponding protein

levels which are of greater importance in determining cellular functions. There is evidence that mRNA levels and protein levels, measured in the same biological samples, do not correlate.

Here, we take a mildly critical look at this body of literature, starting from the numerical precision with which such data is reported, archived and used. We find that much of the quality of inference reported is unaffected by progressive quantization of the data, often down to binary levels. We discuss some specific modeling advantages of binary transcript to me representations, and offer an explanation in terms of a hitherto un-noticed systematic variability in probe level measurements. We will also discuss approaches to constructing data-driven analysis of the relationship between mRNA and protein concentrations.

Speaker:

Mahesan Niranjan is professor of Electronics and Computer Science at the University of Southampton. He was educated in Peradeniya, Sri Lanka (BSc, 1982), Eindhoven, The Netherlands (MEE, 1985), and Cambridge, England (PhD, 1990). He has held a lectureship in Information Engineering at Cambridge University (1990-1998) and a professorship in Computer Science at The University of Sheffield (1999-2007), prior to his appointment in Southampton. At Sheffield, he has served as Head of Computer Science (2001-2003) and Dean of Engineering (2006-2008). His research interests are in the algorithmic and applied aspects of Machine Learning, with a particular focus on applications in Computational Biology.