

ST414: Advanced Topics in Statistics

Asymptotic Statistics

Lecture 8

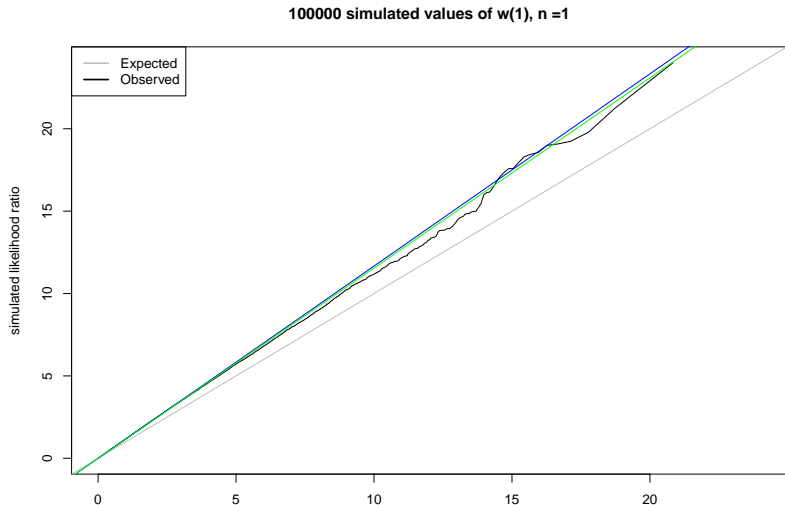
Ioannis Kosmidis

Research Fellow
Department of Statistics

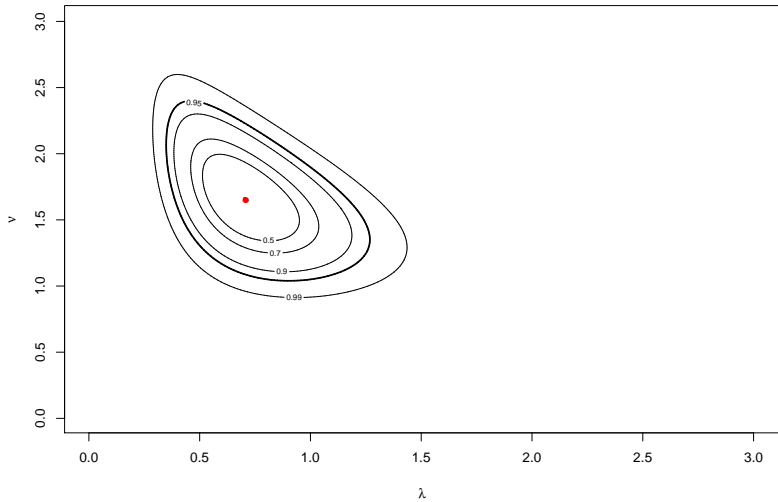


4th December 2009

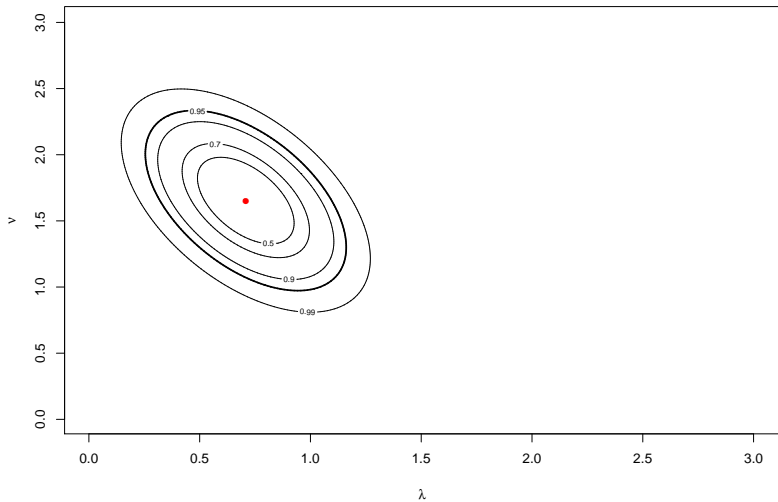
Figure: Q-Q plot of 100000 simulated values of $w(1)$ against the quantiles of a χ_1^2 distribution for $n = 1$. The grey line is expected relationship between the quantiles of the χ_1^2 distribution and the values of $w(1)$. The blue and the green lines are through the origin and have slopes the expectation of $w(1)$ up to order $O(n^{-2})$ and the exact expectation of $w(1)$, respectively.



Confidence regions based on $w(\lambda, v)$ at various levels



Confidence regions based on $t^2(\lambda, v)$ at various levels



Confidence regions based on $s^2(\lambda, v)$ at various levels

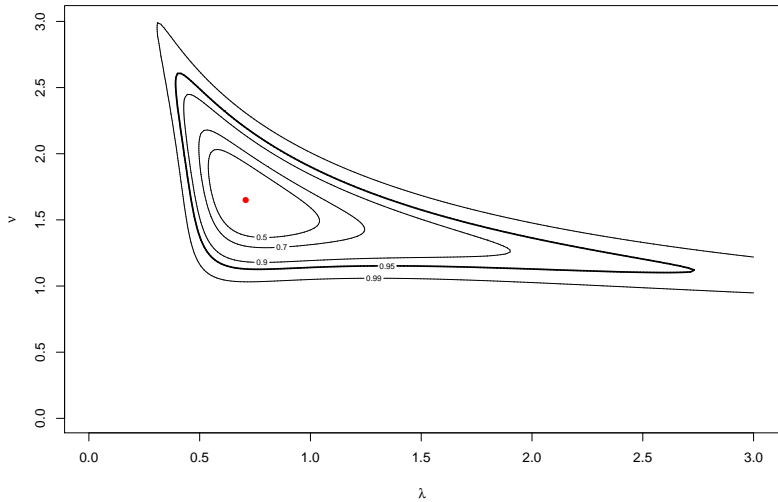
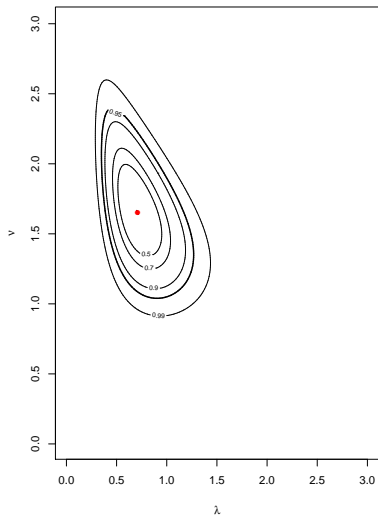


Table: Estimated coverage of confidence regions based on $w(\lambda, \nu)$, $s^2(\lambda, \nu)$ and $t^2(\lambda, \nu)$ when $n = 20$. The estimates are based on a simulation of size 10000 when the true parameter values are $\lambda_0 = 1$ and $\nu_0 = 1$.

Nominal	$w(\lambda, \nu)$	$t^2(\lambda, \nu)$	$s^2(\lambda, \nu)$	Simulation s.e.
0.90	0.8900	0.8938	0.8538	0.0030
0.95	0.9455	0.9428	0.9041	0.0022
0.99	0.9875	0.9816	0.9573	0.0010

Confidence regions based on $w(\lambda, \nu)$ at various levels



Confidence regions based on $w(\phi_1, \phi_2)$ at various levels

