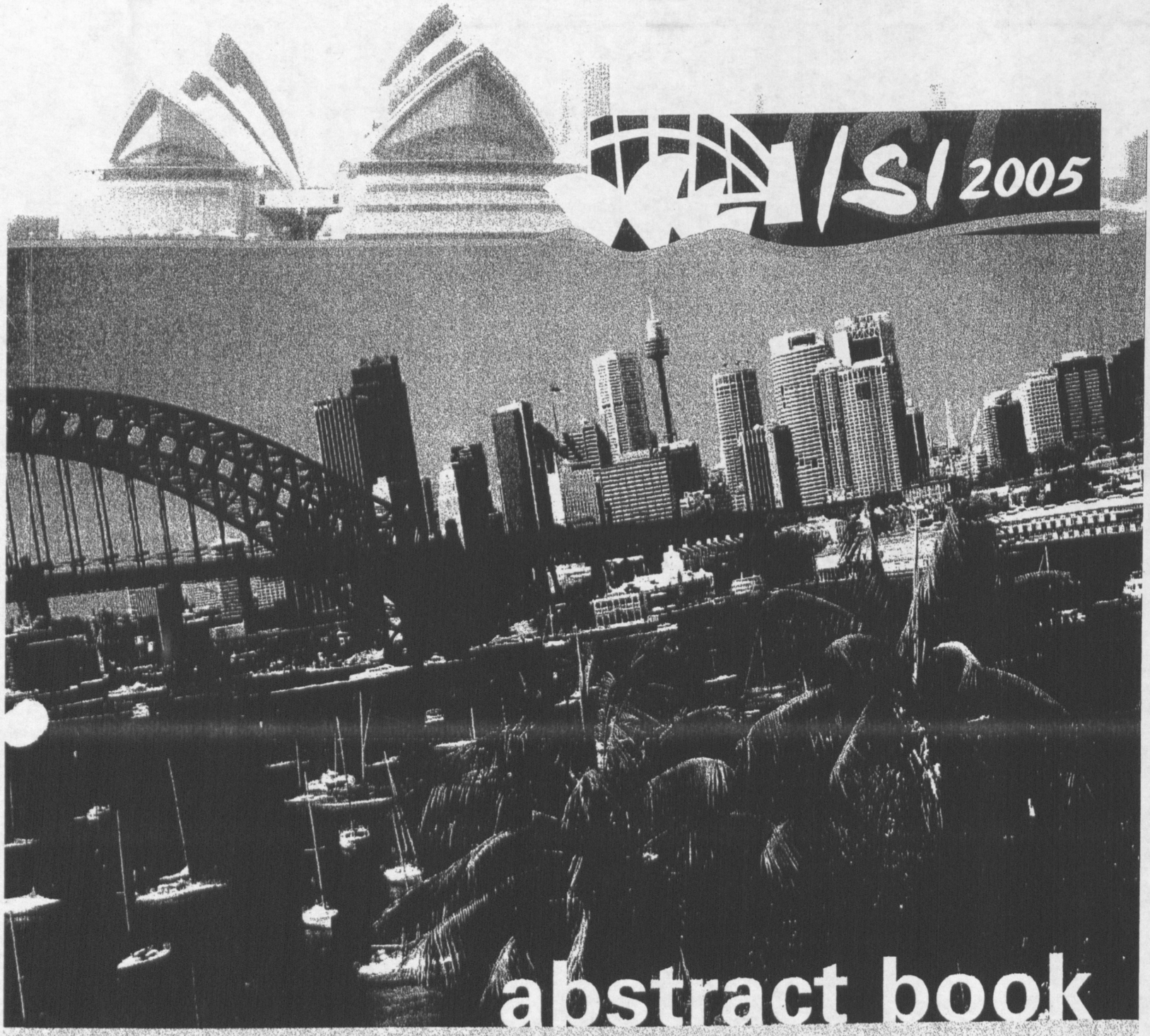

abstract book

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AGE AFFECTING CONTROL IN BIOLOGICAL SYSTEMS

Boyan Dimitrov, David Green, Jr, Peter Stanchev

Biological systems can be treated similarly as the devices constructed to perform some preset functions considered in reliability. They perform their functions in the presence of a great number of random factors which may disturb the normal operations. In terms of reliability, keeping most of the biological objects under control is maintenance. The malfunction of some level of the bio-system is equivalent to a failure in the technical device. The applied cure in the bio-system corresponds to the respective repair in reliability. Some medications may make the biological object younger; other may make it older, or not deteriorate its current age. Such kind of "maintenance" has some analogous models in reliability repairs. We use it to incorporate some results of ours and other reliability and bio-modeling with the quantitative studies of the aging and resistance of bio-systems to environmental stress factors. We call as "calendar age" the age of a bio-object which does not use medication, or uses it without age improvement, or deterioration. All bio-objects that use medication of same strength and direction of effect have "virtual age". And we illustrate our general result on the example of the Gompertz law of mortality, and explain the relations of the longevity, mechanism of aging and age affecting control.

Numeric and graphical examples are provided.

RELATIVE EFFICIENCY OF PARAMETRIC AND BOOTSTRAP ESTIMATES OF COSTS

Malcolm Hudson, Adrienne Kirby

Clinical trials are now making empirical cost comparisons of alternative therapies. Using data collected in the Lipid study of effectiveness of statin therapy, we define and compare parametric and bootstrap estimates of cost comparisons. We provide parametric estimates and confidence intervals appropriate for cost comparisons. The efficiency in the Lipid study of parametric approaches relative to bootstrap estimates is assessed.

DECISION MODELS FOR VALUING EFFECTIVENESS OF NEW DIAGNOSTIC TECHNOLOGIES – WITH APPLICATION TO PET DIAGNOSTIC TESTING

Zhixin Liu, Malcolm Hudson, Sarah Lord, Val Gebski

The clinical value of a diagnostic test on patient outcomes is ideally assessed by randomized trials, however these studies are often not available or feasible for new diagnostic tests. The aim of this paper is to provide practical guidance to clinicians and researchers about the use of decision analytic methods for the assessment of the effectiveness of diagnostic tests. Our approach is based on the use of published data about the accuracy of the test of interest, its impact on management and the effectiveness of subsequent treatment and the linkage of this evidence using decision analytic methods. This approach (i) provides an evaluation of test effectiveness, (ii) identifies clinically relevant factors that may alter this estimate, and (iii) identifies gaps in the current literature that require further research for an evidence-based estimate of test effectiveness.

(14.) Dimitrov B., Green D. Jr., Stanchev P., "Age Affecting Control in Biological Systems", ***55th Session of the International Statistical Institute***, Sydney, Australia, 2005, 337.