Conditional Entropy and Failed Error Propagation in Software Testing

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Entrada libre hasta completar el aforo

Resumen:

In failed error propagation (FEP), an erroneous program state (that occurs in testing) does not lead to an observed failure. FEP is known to hamper software testing, yet it remains poorly understood. If we could, for example, assess where FEP is likely to occur then we might be able to produce more effective notions of test coverage that would incorporate an element of semantics. This talk will describe an information theoretic formulation of FEP that is based on conditional entropy. This formulation considers the situation in which we are interested in the potential for an incorrect program state at statement s to fail to propagate to incorrect output. The talk will explore the underlying idea, metrics that have been defined to try to estimate the probability of FEP, and experimental evaluation.

Sobre Robert M. Hierons:

Rob Hierons received a BA in Mathematics (Trinity College, Cambridge), and a Ph.D. in Computer Science (Brunel University). He then joined the Department of Mathematical and Computing Sciences at Goldsmiths College, University of London, before returning to Brunel University in 2000. He was promoted to full Professor in 2003. Rob Hierons' main research largely concerns the automated generation of efficient, systematic test suites on the basis of program code, models or specifications. He also has a significant interest in program analysis and automated transformation techniques such as program slicing. He is joint Editor of the Journal of Software Testing, Verification, and Reliability (STVR). He has organised or been on the steering committee of several international conferences and workshops. He has published over 150 papers in international workshops, conferences and journals including in top journals such as SIAM Journal of Computing, IEEE Transactions on Computers, IEEE Transactions on Software Engineering, and ACM Transactions on Software Engineering and Methodology.