Using Data Mining For Automated Design of Software Tests

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Abstract:

In today's software industry, the design of test cases is mostly based on the human expertise, while test automation tools are limited to execution of pre-planned tests only.

Evaluation of test outcomes is also associated with a considerable effort by human testers who often have imperfect knowledge of the requirements specification.

Not surprisingly, this manual approach to software testing results in heavy losses to the world's economy. In this talk, we demonstrate the potential use of data mining algorithms for automated modeling of tested systems.

The data mining models can be utilized for recovering system requirements, designing a minimal set of regression tests, and evaluating the correctness of software outputs.

To study the feasibility of the proposed approach, we have applied a state-of-the-art data mining algorithm called Info-Fuzzy Network (IFN) to execution data of a complex mathematical package. The IFN method has shown a clear capability to identify faults in the tested program.

This is a joint work with Prof. Abraham Kandel from the University of South Florida and Dr. Menahem Friedman from Ben-Gurion University of the Negev.