

# Optimizing Test Design Using Tools

## Pairwise, Orthogonal Arrays and Classification Trees

### Abstract

Many test engineers learn and get certified, but rarely use the test design techniques that they have been taught. I found it strange, but then realized that testers like to use tools, and if techniques were implemented via tools, they would have used them more.

Pairwise and Classification Trees are very good and efficient techniques for test design, prioritization of tests, and for saving time and money on performing the right tests first.

In this workshop, I shall present the techniques, and the tools (mostly freeware) to exercise them in your projects right after the training.

Hands-on exercises will be performed throughout the workshop to exercise participants in using the techniques via the tools.

### Workshop objectives

The objectives of this workshop is to give the participants a practical overview of

- What is Pairwise and Orthogonal Arrays?
- How to analyze parameters for optimization?
- How to use the freeware 'allpairs' tool by James Bach, in your projects
- How to use the freeware 'PICT' tool by Microsoft (for pairwise), in your projects
- What is Classification Trees?
- How to use the classification Trees/Testona Editor tool in your projects?

The workshop emphasizes the implementation of the techniques using the freeware tools that will be provided. Through presentation, discussion, debate, brainstorming, questioning, and hands-on exercises - we shall learn how to implement those techniques in our projects.

## Audience

Testers, testing team leaders and test managers, that would like to know these very efficient techniques for optimizing test design and their practical implementation, using proven tools (open source, free, commercial).

## Pre-requisites

Participants should have basic testing knowledge about testing life cycle, testing techniques and methods, test measurements.

Note: Class participants should have laptops/PC, with Windows 7/8/10, internet and email access and Office 2010 and up. Tools shall be provided and installed during the workshop as an install exercise at the beginning of the day.

## Coach

**Alon Linetzki**, founder of Best-Testing and lately of [QualityWize™](#), has been a coach & consultant in development, testing and quality assurance for more than 30 years.

Alon has been involved in supporting organizations to enhance testing skills and operations, supporting executives and managers in optimizing and improving their processes (testing and development), optimizing dev and test operations to increase ROI, setting up measurement programs, advising on setting up test automation platforms and operations, leading projects into Agile implementation, dealing with requirements and specification ambiguity and analysis and more.

Alon's main domains of expertise are in Agile testing and Transition to agile, SW process and Test Process improvement & Optimization, Exploratory Testing, Risk Based Testing and Test Automation, and recently mobile application testing, Cloud testing and Security Testing.

He is an author and reviewer of the **ISTQB® Agile Tester certification**, participating author of the ISTQB® Technical Agile Tester (Advanced), co-founded ISTQB® in Israel (ITCB), Chair of the ISTQB® Marketing, ISTQB® Partner Program lead, and has established SIGiST Israel (the Israeli Testing Community Forum).

From time to time, he lectures at the SCE University in the industrial engineering department on quality assurance and testing related topics.

## Duration

1 day workshop.

## Workshop Outline

### 1. Introduction

- Presenting participants and trainer
- Challenges we are facing in testing today
- Challenges we face in test design

### 2. Classification Trees

- The CT basics
  - The Classification trees Method
  - Basics of CT
  - An Example
    - Business, Functional and Component tests
  - Exercise
- Classification Trees Editor Tool
  - Introduction and demo
- Advanced aspects in CT
  - Coverage using CT
    - Minimum & Maximum
  - Exercise
  - How to reduce test cases?
- Benefits of Classification Trees

### 3. Pairwise, Orthogonal Arrays & All-pairs

- The problem
- What is pairwise testing?
  - Calculating the pair combinations
  - Pairwise in the research
  - Why does pairwise testing works?
- Pairwise & orthogonal arrays algorithms
  - Potential test case explosion
  - Pairwise theory
  - Orthogonal arrays theory and algorithm (using an example)
  - Exercise (orthogonal arrays)
  - All-pairs algorithm
  - Using all-pairs (tool demo)
  - Exercise (hands-on all-pairs, JB)
  - PICT tool demo
  - Exercise (hands-on PICT, MS)
- Implementation Risks...

### 4. Wrap-up

- Your "take-away" from this course
- Summary discussion

Note: the syllabus outline may vary, and additions or subtractions of topics and subtopics may occur – all in favor of delivering a better course content, that is relevant, up-to-date, and adding value.