

# Tests and Perception: a Vaster Scope

CCCA11

Yves Chaumette, Francis Rousseaux

15/03/11

Tests and perception

1

## Stakes

- Progress questions certainty
- And goes toward fluidity and subtlety
- Perception completes judgment and propositions ( $A = B$ )
- We'll try to model perception for increasing synthesis (versus analysis)

15/03/11

Tests and perception

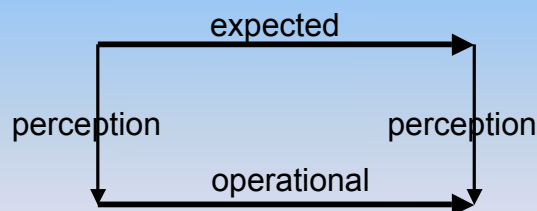
2

# Approach

1. Setting the problem
2. Example of a query
3. Recourse to the mathematics
4. The operation of negation: 3 worlds
5. Models of tests and query
6. Further added value

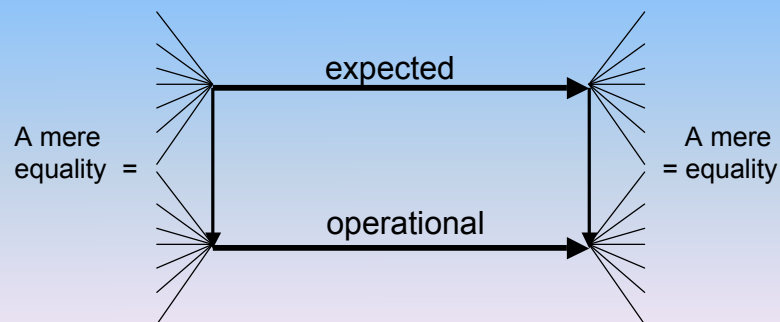
## 1. Setting the problem “Double path” principle

- Test are checking an expected behaviour
- The principle has been enunciated by Pohl & al.
- Commutative squares are frequent in the theory of categories



## Analysis of requirements

- Analysis reduces the impact of perception
- Comparison is merely an equality and thus neglected
- Synthesis is assumed and minimized



15/03/11

Tests and perception

5

## 2. Example: test of a query

- Let us assume we are looking for a reference of the double path principle
- **What is tested is our understanding** of a research engine
- Shall we get the results we expect?
- Have we put the right words?
- “Test principle software - biology - medicine- chemistry”
- It gives 844 000 items
- Yet 6 books in 2 pages
- Among them twice this principle and more ideas

15/03/11

Tests and perception

6

Google scholar Tests principes software -biology -medicine -chemist Rechercher Recherche avancée Scholar

Rechercher sur le Web Rechercher les pages en français

Scholar date indifférente inclure les citations Créer une alerte par e-mail Résultats 1 à 10 sur un total d'environ 846 00

Conseil : Recherchez des résultats uniquement en français. Vous pouvez indiquer votre langue de recherche sur la page Préférences Scholar.

[CITATION] The art of software testing [PDF] à partir de noqualit  
GJ Myers - 2008 - Wiley-India  
Cité 2528 fois - Autres articles - SUDOC Catalogue - Les 57 versions

[LIVRE] Principles of software engineering management [PDF] à partir de chula.ac  
T Gibb... - 1988 - pioneer.chula.ac.th  
... The multiple test principle Software systems should have formally defined acceptance test criteria which are applicable at all times for all critical qualities. The principle of software productivity If is not the software itself which is productive. ...  
Cité 749 fois - Autres articles - Version HTML - SUDOC Catalogue - Les 9 versions

Effective methods for software testing  
W Perry - 2006 - portal.acm.org  
... are a few things to say in favour of this book: 1. It does walk through on how to approach testing in your organization (however, it is definitely oriented towards organizations with established testing principles). 2. It does give you some background information on software testing. ...  
Cité 212 fois - Autres articles - SUDOC Catalogue - Les 9 versions

[LIVRE] Software product line engineering foundations, principles, and techniques [PDF] à partir de tiara.ru  
K Pohl, G Böckle... - 2005 - books.google.com  
... differences Motivation between SPLE and development of single systems (Chapter 2); challenges for testing (Chapter 13) (2) Principles of software product line variability; the orthogonal variability in ability meta model (Chapter 4); documenting variability in test arte-test ...  
Cité 833 fois - Autres articles - Les 14 versions

## Myers Principle

- A necessary part of a test case is a definition of the expected output or result
- A test case must consist of two components
  1. A description of the **input data** to the program
  2. A precise description of the **correct output** of the program for that set of input data [page 16]
- After a programmer has designed and coded **constructively** a program, it is extremely difficult to suddenly change perspective to look at the program with a **destructive** eye [page17]

## Pohl & al., page VI

### III. Book Overview

<i>Framework for product line engineering</i>	The book is organised according to our framework for software product line engineering, which has been developed based on our experience in product line engineering gained over the last eight years. The framework stresses the key differences of software product line engineering in comparison with single software-system development:
<i>Two processes</i>	a) <i>The need for two distinct development processes: domain engineering and application engineering.</i> The aim of the <i>domain engineering</i> process is to define and realise the commonality and the variability of the software product line. The aim of the <i>application engineering</i> process is to derive specific applications by exploiting the variability of the software product line.
<i>Variability</i>	b) <i>The need to explicitly define and manage variability.</i> During domain engineering, variability is introduced in all domain engineering artefacts (requirements, architecture, components, test cases, etc.). It is exploited during application engineering to derive applications tailored to the specific needs of different customers.

15/03/11

Tests and perception

9

## General results

- Confirmation of the double path in 2 references
- 30 Principles listed in a paper, principles are a mere guide for action
- Testability, a new quality is viewed in this quest
- The search ends after 40 minutes

15/03/11

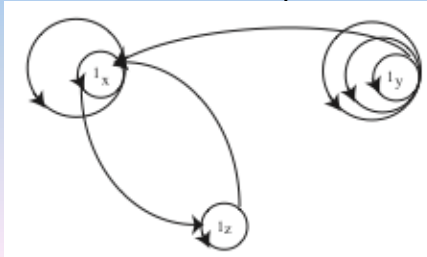
Tests and perception

10

### 3. Recourse to Mathematics

#### The theory of category

- A category is a set of arrows (transition between states)
- They have a partial composition law
- Sources and goals of arrows = **objects** are identified with identity **loops** (neutral elements for the composition)
- Most categories concern algebraic structures: groups, sets, ordered sets, vectorial spaces

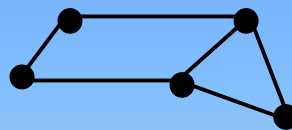


15/03/11

11

### 2 based structures

- Graph



- An edge is a ternary between 2 vertices

- Half edge



- Vertex and half edges



- Whorl



Interiority and relational ability

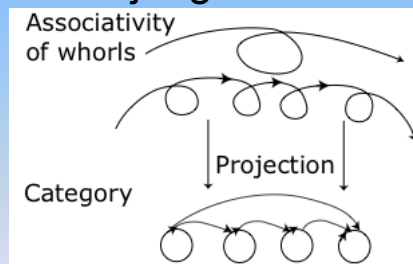
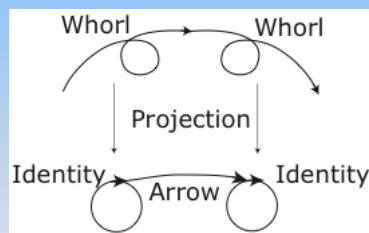
15/03/11

Tests and perception

12

## Composition of whorls

- $A = B$   
or 2 perceptions produce a judgement



15/03/11

Tests and perception

13

## Limits and sketches

- The human mind sets limits for knowing what one is dealing with
  - Limits for budgets, plans, contracts
  - Transformation = Transition between states
  - Precision, definition, analysis, judgment
- However the movement (becoming, consciousness) does not stop
  - Gesture, perception, quest
  - State = dynamic equilibrium
  - Creativeness, evolution
- A 2-based Trend is not reliable

15/03/11

Tests and perception

14

## 4. Operation of negation

- Results can be negated (cognitive field)
  - Actions can be inverted (action field)
  - Example: a test result is OK or not
- Perceptions can't be negated, they escape judgment
  - They have a reverse: an absence or modification
  - "I'm looking over there", a test game
- A question can't be false and has no reverse
  - A value for action has no reverse and no negation
  - Example: customer service, reliability, truth

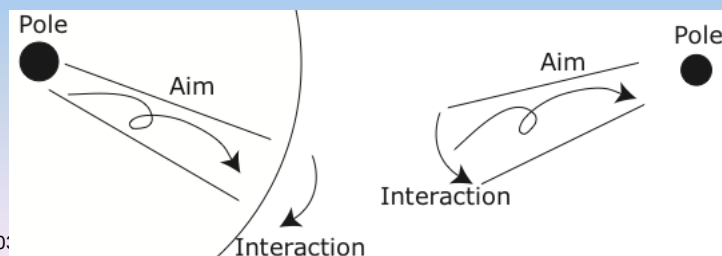
15/03/11

Tests and perception

15

## The world of poles - types

- Questions, values have no inverse
- For these poles all interactions collapse
- They might be represented as black holes
- Gestures and perceptions are interfaces between actions and poles
  - Whorls project on poles and on arrows
  - Such an interface encompass a class of whorls



15/03/11

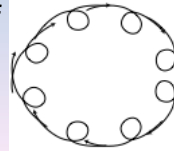
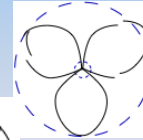
16



# Movement

There are two ways of returning to the self = identity

1. By the outside = **rotation**
  - Going to the Other
2. By the inside = **pulsation**
  - Staying in link with itSelf
3. By a composition of both: **spiraling**
  - It gives helix and blades
  - A ring of whorls return to the self



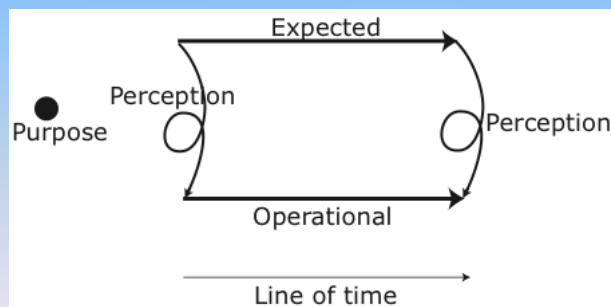
15/03/11

Tests and perception

17

## 5. Models: 3 worlds in testing

- The double path principle is enriched

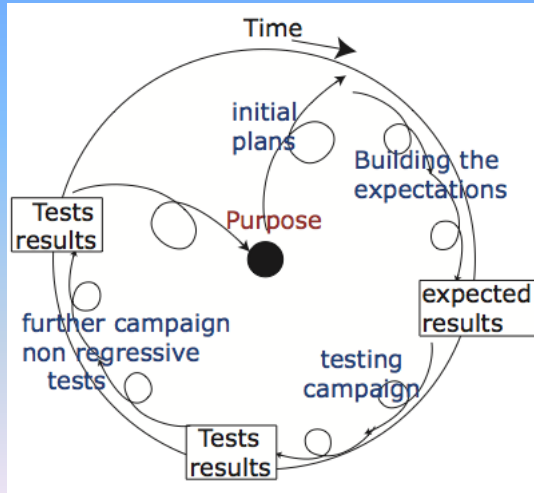


15/03/11

Tests and perception

18

# Test life cycle

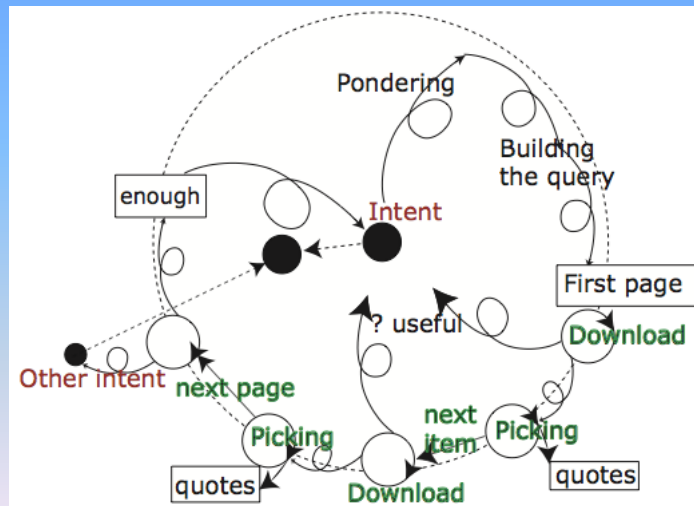


15/03/11

Tests and perception

19

# Cycle of a query



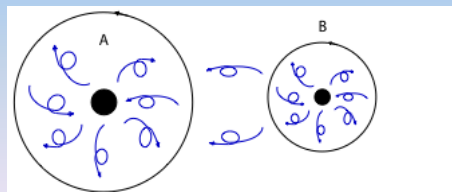
15/03/11

Tests and perception

20

## 6. Further added value

- Whorls do not apply only on a query or on a test
- It describes also the transmission of ideas from one project to another resulting in an import of patterns



15/03/11

Tests and perception

21

## Threats and perspectives

- Threat : **Fixity of mind**
  - To use determined objects
- Threat : **Any** whorl projects on **an** arrow
  - Any gesture is an act or interaction
  - However hint of a **ratio of  $10^6$**  perceptions for one object
- Use : **Gestation** of an idea
  - Creativeness
  - Emerging priorities before a decision
  - Real-time computing

15/03/11

Tests and perception

22

## References

- Husserl, Merleau-Ponty, Patocka, Badiou, Barbaras
- Mac Lane, Eilenberg, Bailly & Longo, Guitart
- Gilles Châtelet, Alunni, Jedrejewski
- Pohl, Myers, Gibbs

## Unending thinking

- Thanks for your attention
- Let us ponder together