TestNet theme evening
14 September 2017

How will test robots help us testers

Can test tools also test exporatory and assess results?

Rik Marselis
SOGETI

Sander Mol
SALVES

Robotica?

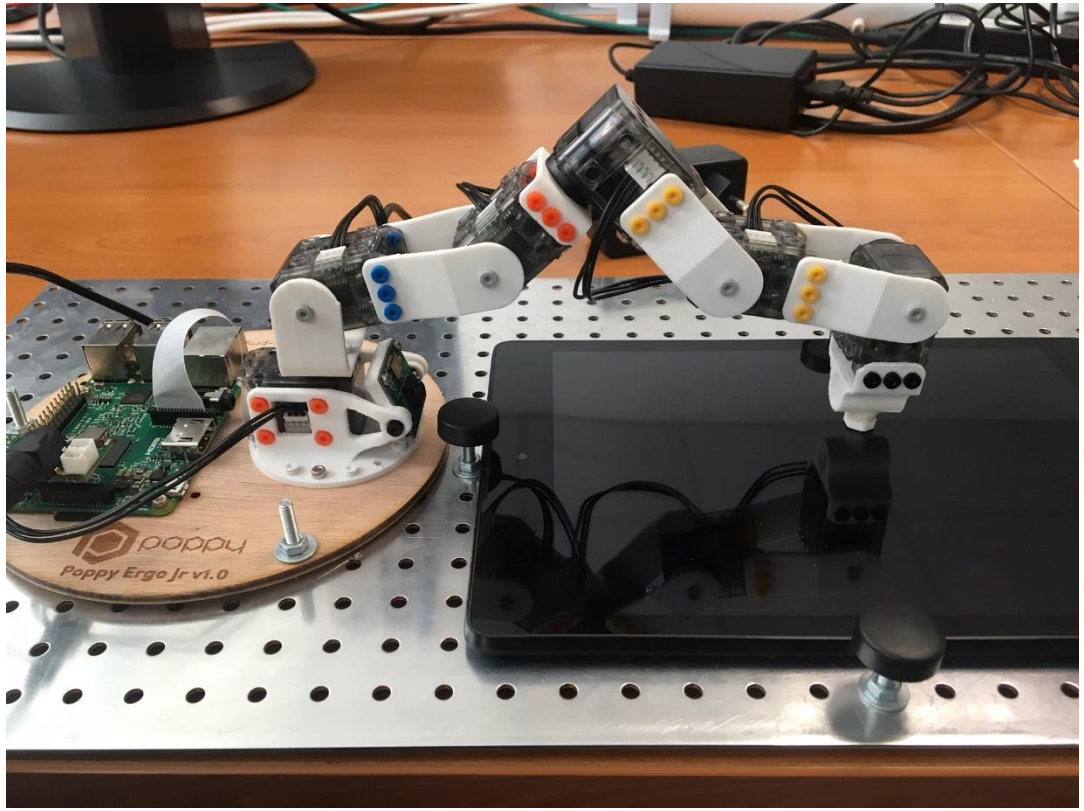
What by today's definition is a robot?
It's a machine that gathers information about its environment by input of sensors and based on this input changes its behavior.
Combined with machine learning and machine intelligence the robot's reactions over time get more and more adequate.
The use of Internet of Things, Big Data Analytics and Cloud technology make a robot versatile.

A Robot can come in many different shapes and forms. It's not just the metallic man. It may just as well be an autonomous vacuum cleaner, a self-driving car a chatbot or a personal digital assistant.

How can we test better using robotics?

Physical robots

Example: Use a small and cheap (€ 300) robotic arm to test mobile devices.



How can we test better using robotics?

Functional testing

- Generate test cases
- Execute test cases
- Analyse the results

The next step in test automation

Brute-force testing

- Generate a huge number of test cases and execute them

Non-functional testing

- Intelligent performance testing

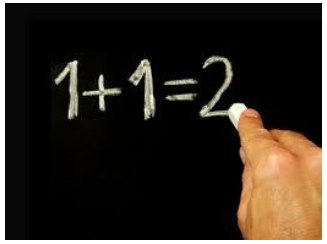
And so much more!!!!!

Can Machine Intelligence help?

What is a great challenge with testing business processes?
Predicting the expected outcome.

Use machine intelligence to analyze the test situation and to predict the expected outcome.

Advantages:
The machine intelligence is better at strictly applying rules (no errors in output predictions)
Less manual labour



Disadvantage: The rules must be very clear

Today’s test automation

Today's test automation

discussion:
How much intelligence is there intoday's test tools?

Meanwhile at Google Deepmind

AlphaGo beats the world champion Go. And then wins every other challenge.

But they can do more at Deepmind

- Tool only sees pixels, no ball, no cohesion
- Tool discovers that he can drive something
- Tool discovers the purpose of the game
- Tool achieves the perfect score in the most efficient way

Google DeepMind's
Deep Q-learning

And they do it for multiple Atari games

Pong
Space Invaders
Seaquest
Beam Rider

all with **one** tool

… which teaching itself *everything*

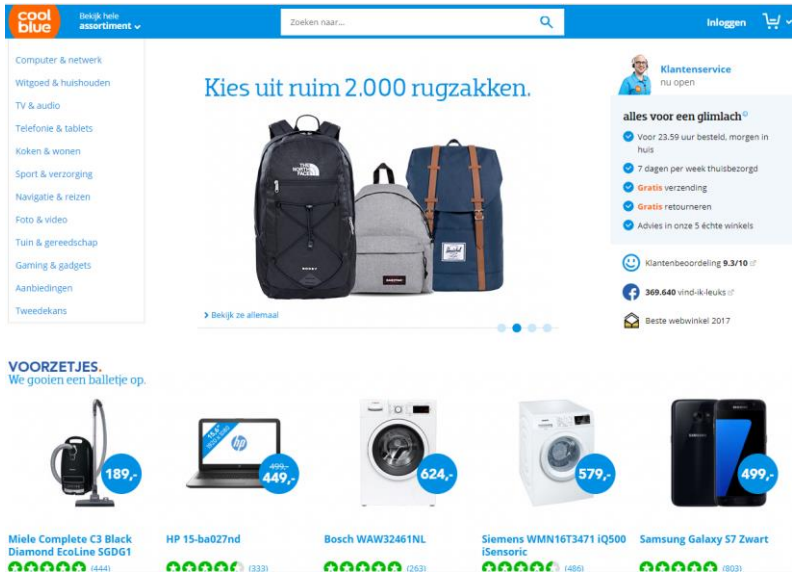
What does this tool learn?

- The objects and the controls
- The goals
- The rules
- What does work and what does not work
- The variations that you can encounter

Google Deepmind tool voor testers?

The tool would click without any prior knowledge, start typing, dragging and so on, and explore the application that we want to test :

- The objects and the control
- The goals
- The rules
- What does work and what does not work
- The variations that you can encounter



Google Deepmind

Collaboration: supervised learning

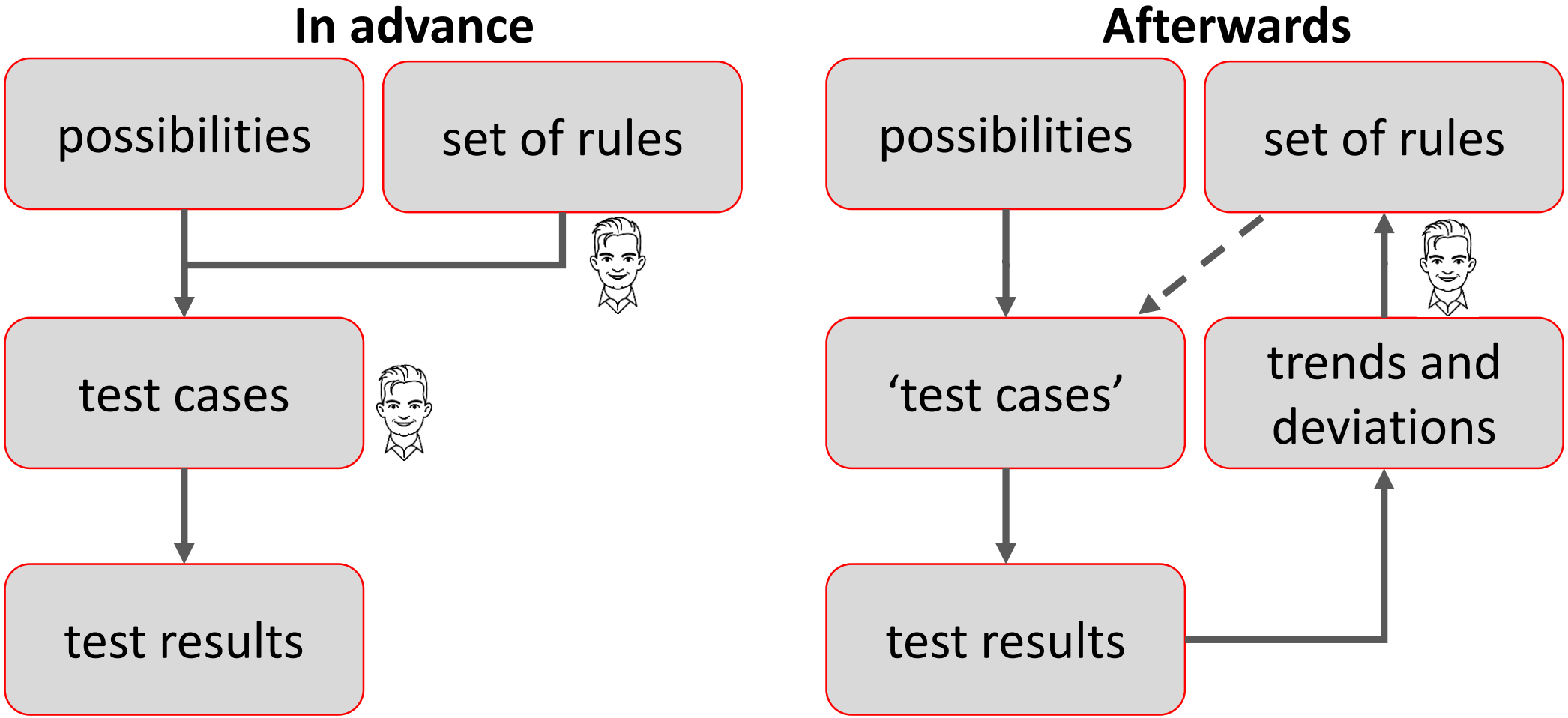
Help to get started

- Providing inputs (such as valid postal codes or telephone numbers)
- Indicate in advance what the most important paths are

Help the analysis

- The tool tries everything
- The tool summarizes what he has found, including a cross that he thinks is wrong
- Man indicates what is actually wrong
- The tool learns from that

Machine Learning ‘afterwards’



The tool is getting more and more knowledge

The power of this tool is, as with existing tooling, in the repetition.

- with knowledge of how it worked, the tool knows what is different
- the reporting takes into account the previous human assessment

And after 1,000 applications the tool knows what is expected in general.

The tool gains more knowledge of …

- **User-friendliness**
  (color contrast, maximum number of steps, etc.)
- **Performance**
  (maximum number of seconds)
- **Functional paths**
  (desired and undesirable, unexpected, optimal)
- **Security measures?**

Do we still need testers?

YES!

Especially in the beginning:
- Giving input
- Prioritize
- Structuring results
- Good and error situations

And later on, also:
- Attention to quality
- Still: prioritize

Although the 'business' can take over part of the assessment

Our summary.

- Test robots could explore an application themselves, the technology is already there
- For the time being, people will have to help determine what is right and wrong, but a robot learns quickly
  - A robot can discover trends when testing different applications, and discover more and more errors
  - There will always be someone who keeps an eye on quality, no matter how many tools we have

The test automation of "tomorrow"

discussion:
what could you do with such a tool? and what (not) yet?

How will this develop further?

We’d like to find out, along with you!

Rik Marselis
rik.marselis@sogeti.com

Sander Mol
sander.mol@salves.nl

The original article

Dutch:

https://www.linkedin.com/pulse/testen-met-zelflerende-en-zelf-explorerende-testtools-sander-mol

English:

http://labs.sogeti.com/testing-self-learning-self-exploring-testing-tools/