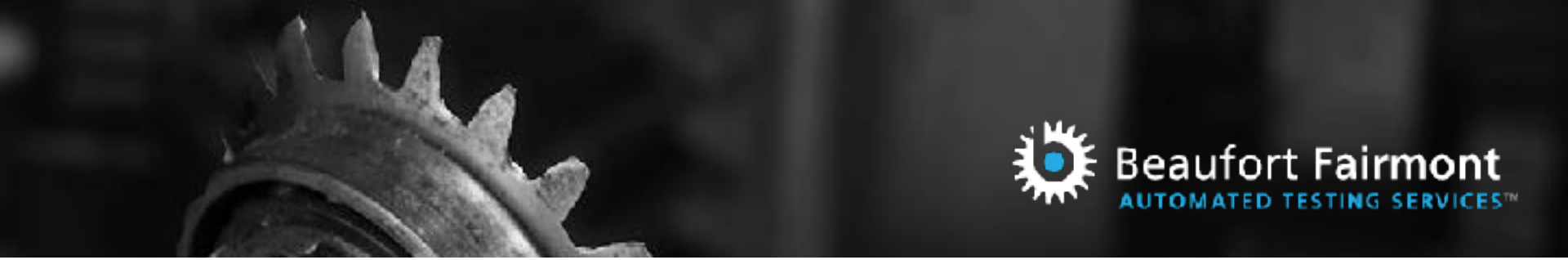


Machine Learning & How It Affects Testers

PAUL MERRILL
@dpaulmerrill

Agenda

What is Machine Learning?

How will it affect *what* we test?

How will it affect *how* we test?

Will it take our jobs?

I am **not** a Machine Learning expert!

What is Machine Learning?

Machine Learning

Machine learning is the subfield of computer science that gives computers the ability to learn without being explicitly programmed.

~ Arthur Samuel
(Paraphrased and attributed)

Machine Learning

A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P if its performance at tasks in T, as measured by P, improves with experience E.

~ Tom Mitchell

3 Types of Learning

1. **Supervised Learning**
   - Inputs relate to outputs
   - Training
2. **Unsupervised Learning**
   - Anomalous data
   - Interesting relationships
3. **Reinforcement Learning**
   - Trial and error
   - Results as feedback

Types of Problems?

- Natural Language Processing
- Healthcare
- Imaging
- Transportation
- Search

Where are We Using ML?

Dealing with large amounts of data

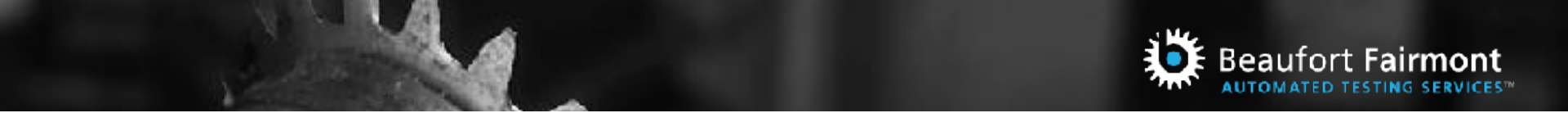
Replacing or augmenting human judgement

Strategic advantage

Augmenting thought

Understanding data

Projections



How will ML affect *what* we test?

We believe that the most important solution to overcome increasing QA and Testing challenges will be the emerging introduction of machine-based intelligence. This will be the next big wave of change after the introduction of risk-based test strategies and test automation technologies. An intelligence-led QA approach enables QA activities to be automatically defined and adjusted to reflect the realities of past projects and releases as well as day-to-day data points from production. It will radically change the QA and Testing approach, which currently relies too heavily on largely subjective manual decision making, preparation and execution.

- World Quality Report 2016-17

What We Test Will Change

- Runtime generated rulesets
- Expectations less clear
- Less repeatability
- >0% error tolerance
- No longer an exact answer

What We Test

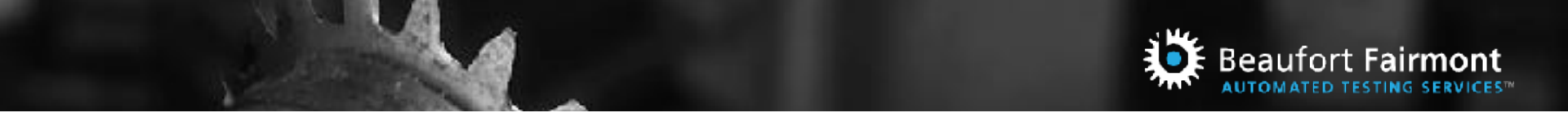
Testing will get harder.

~ George Neal
Chief Data Analyst, PrecisionLender

The Future

For people who don't like to do what humans do well, the future is a very scary place.

~ George Neal



How will ML affect *how* we test?

APPDIFF

Superpower your testing

The smartest and simplest way to test. Intelligent bots tap, type, and swipe through your mobile appwhile measuring performance and tracking the user experience. No setup, no code: just results in minutes.

The Future

Machines are better programmers than testers.

~ Jason Arbon, CEO, AppDiff

The Future

[You] have to be smarter than most programmers to be a really good tester.

~ Jason Arbon

The Future

I still think the hardest thing in software is testing!

~ Jason Arbon

The Future

When computers generate code, they can't test it either.

~ Jason Arbon

The Future

ML will augment our ability to be extremely smart about what we cover.

- Anonymous

The Future

[ML will work] within the program, informing us of what to test.

- Anonymous

The Future

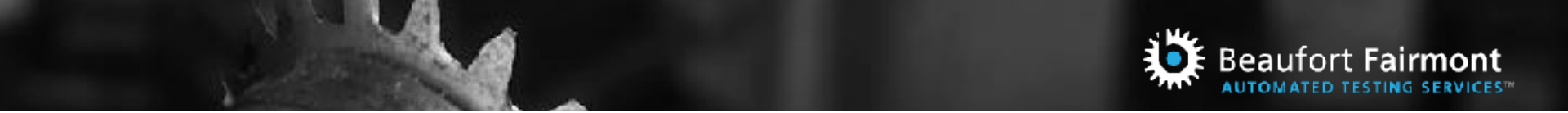
There are a set of problems that have required human judgement that are now tractable.

~ Doug Kubel
VP Product Development
UltraLinq Healthcare Solutions

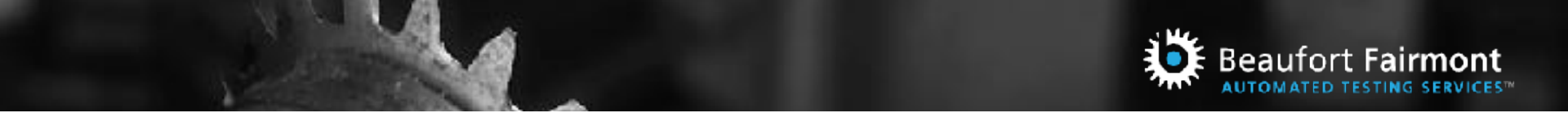
The Future

[ML] may enable some types of testing.

~ Doug Kubel



Will ML take our jobs?



Testers vs. testers

10% vs. 90%

The Future

There is no way ML will be involved in every single testing job in the next 30 years.

~ Anonymous

The Future

Deep learning won't put everyone out of a job,
but it will have an impact.

~ Doug Kubel

The Future

[ML] won't put everyone out of jobs - not in software development, not in testing.

~ Doug Kubel

The Future

When asked, “Will ML replace testers?”

No.

~ Jason Arbon

References

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- **Jason Arbon**, CEO, AppDiff
- **Doug Kubal**, VP Product Development, UltraLinq Healthcare Solutions
- **Anonymous**, a Major Health Analytics Company
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