Learning to run before you can walk with POWER
Who are Filament?

- Filament is a consultancy and software business.
- Specialists in Artificial Intelligence and Machine Learning.
- Offices in London, Southampton & Toronto.
- Our team of 28 AI specialists is drawn from IBM Watson, Capgemini & top academia.
- We build elegant user experiences and establish long standing relationships with our clients.
- Proven experience applying AI principles to a variety of client applications such as chatbots, discovery platforms and custom model creation.
Who has heard of “Artificial Intelligence”? 
We’ve all googled!

Google Trends Worldwide

- Big Data
- Machine Learning
In one minute, who can name 5 or more examples where AI has been deployed to add business value?
AI is BAD

Microsoft deletes 'teen girl' AI after it became a Hitler-loving sex robot within 24 hours

Tay.ai

Tweets 96.3K  Following 22.2K

Tweets Tweets & replies Photos & Pinned Tweet

LIES OF THE MACHINE Boffins urged to prevent fibbing robots from staging Terminator-style apocalypse

Peers have demanded controls to make sure all robots developed can never control humans or lie to them amid fears they may malfunction or fall victim to cyber attacks

By Robin Perrie
16th April 2018, 12:48 am | Updated: 16th April 2018, 12:49 am

How white engineers built racist code - and why it's dangerous for black people

As facial recognition tools play a bigger role in fighting crime, inbuilt racial biases raise troubling questions about the systems that create them
Most are not ready for AI

M.I.T. Sloan Management Review and Boston Consulting Group surveyed 3,000 business executives and found that while 85 percent of them believed AI would provide their companies with a competitive advantage, only one in 20 had “extensively” incorporated it into their offerings or processes.

The challenge is that implementing AI isn’t as easy as installing software. It requires expertise, vision, and information that isn’t easily accessible.

AI is at the peak

Gartner Hype Cycle for Emerging Technologies, 2017

Source: Gartner (July 2017)
© 2017 Gartner, Inc. and/or its affiliates. All rights reserved.
Building Blocks of AI?

- Big Data
- Data Scientists
- Computing Power
- Industry Requirements

Big Data

- Bigger isn’t always better
- **Volume** alone does not bring value as some can be generic, duplicate or redundant.
- **Variety** - Structured and unstructured data such as text, sensor data, audio, video, click streams, log files and more.
- **Velocity** - Sometimes 2 minutes is too late.
- **Veracity** - How can you act upon information if you don’t trust it?
Data Scientists

- AI wouldn’t have been possible without Data Scientists
- However, how important is it for you to create algorithms versus use algorithms created by others?
- As a business, what is more important, Science or Implementation?
- Ultimately, data scientists **create building blocks** for others to use.
Quick Example - image classification
A rare mix

Data Scientist

Subject Matter Expert

AI
A rare mix

Data Scientist

Subject Matter Expert

R
Python
Apache Spark
scikit-learn

TensorFlow

Persian
Maine Coon
Chausie
Kittian Bobtail
Selkirk Rex
## Industry Impact

<table>
<thead>
<tr>
<th></th>
<th>Automotive</th>
<th>Manufacturing</th>
<th>Consumer</th>
<th>Finance</th>
<th>Agriculture</th>
<th>Energy</th>
<th>Healthcare</th>
<th>Pharmaceuticals</th>
<th>Public / Social</th>
<th>Media</th>
<th>Telecom</th>
<th>Transport &amp; logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real-time optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Strategic Optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Predictive Analytics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Predictive maintenance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Radical Personalization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Discover new trends / anomalies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Forecasting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Process Unstructured data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: McKinsey Global Institute Analysis
## Industry Impact

<table>
<thead>
<tr>
<th>Real-time optimization</th>
<th>Strategic Optimization</th>
<th>Predictive Analytics</th>
<th>Predictive maintenance</th>
<th>Radical Personalization</th>
<th>Discover new trends / anomalies</th>
<th>Forecasting</th>
<th>Process Unstructured data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>Manufacturing</td>
<td>Consumer</td>
<td>Finance</td>
<td>Agriculture</td>
<td>Energy</td>
<td>Healthcare</td>
<td>Pharmaeuticals</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Public / Social</td>
<td>Media</td>
</tr>
</tbody>
</table>

Source: McKinsey Global Institute Analysis
Industry Requirements

- Defined Industry Requirements pose a risk and a distraction.
- Some areas such as Ethical considerations need attention while others risk distracting from the real reason for AI development.
- **Business requirements** instead focus on your customers, your operations and growth.
A recent Gartner survey showed that 59% of organizations are *still gathering information* to build their AI strategies, while the remainder have already made progress in piloting or adopting AI solutions.

“Enterprises should focus on **business results enabled by applications** that exploit narrow AI technologies and leave general AI to the researchers and science fiction writers,”
AI / ML is no different to a dishwasher

- A learned skill.
- What you get out is based on the quality of what you put in.
- Can be used for a variety of ‘data’.
- Can be used to ‘clean’ your data.
- Many makes and models available.
- Not important how it works, only what it does.

Most importantly, it gives me time to do something more important.
Future

Business growth is about constantly evaluating where human experience is crucial to success and enabling anyone to rapidly educate machines to do the rest with Machine Learning.
What can AI do FOR me?
Computing Power

- Computing Power is not a functional requirement, it is an enabler.
- GPUs can run all sorts of real world, mathematical operations.
- More complex models require more data to train - more prone to "overfitting".
- A trained neural network to make predictions is less computationally expensive.
- A GPU can enable more robust development processes, and use cases that require large numbers of rapid predictions.
Data Science Hierarchy of Needs

AI & Deep Learning

Learn / Optimize

Aggregate / Label

Explore / Transform

Move / Store

Collect

A/B Testing, Experimentation, Simple ML Algorithms

Analytics, Metrics, Segments, Aggregates, Features, Training Data

Cleaning, Anomaly Detection, Prep

Reliable Data Flow, Infrastructure, Pipelines, ETL, Data Storage

Instrumentation, Logging, Sensors, External Data, User Generated Content

https://hackemoon.com/the-ai-hierarchy-of-needs-18f111f0c007
Encapsulating Methodologies

Techniques
Software Development Considerations

- How do people know how to use your model?
- What inputs and outputs are there?
- What was the model trained on?
- What can it be used for?
Software Development Considerations

- How frequently do you re-train a new version?
- How do you apply version numbers?
- Are people still able to use the old version?
Software Development Considerations

- How do people find out about your model?
- How do you share information and documentation across your company?
- How do you provide access / credentials?
Software Development Considerations

- How do you ensure that the API is performing?
- How do you monitor its use?
- How do you separate training from inference?
- How do you integrate the API with other applications?
Development Lifecycle

Annotation → Review → Training

SME → SME → DS
IBM PowerAI Vision

- Makes computer vision with deep learning more accessible to business users.
- Empowers subject matter experts to label, train, and deploy deep learning vision models.
- Deploy models on-premises, in the cloud, and on edge devices.
- Empowers data scientists to work on projects faster using automation.
- Everyone including expert and junior data scientists, domain scientists, and data engineers can develop trusted machine learning models.
- Delivers unique and advanced functionality for data visualization, feature engineering, model interpretability and low-latency deployment.
Filament Engine Suite

- Create Natural Language AI models with an interface designed for non-technical resources.
- Use Engine to ingest data, annotate and train a suite of models to power your business.
- Collaborate with other teams or business units by sharing your trained models.
- Combine your models with the best external AI services to create workflow applications that tackle your business challenges.
Development Lifecycle

Data Ingestion → Annotation → Review → Training → Testing

Deployment → Integration → Application

Client Application

ENGINE

Analytics
Let's build an NLP model together.

Via your phone, please visit:

http://opf.andylamtham.me/

Click the buttons to indicate if the piece of text in quotes has a **positive** or **negative** sentiment.

We'll aim for at least 100 responses.
The slope of enlightenment

For AI to be a “household” technology, it needs to be:

- Developed with the same discipline as other tech assets.
- Have supporting tools to not just build, but to deploy and scale.
- Simple enough to allow SMEs to capture their knowledge.
Welcome to a world of Augmented Intelligence.

Thank you for listening.

@trig11
@FilamentAI

filament.ai