

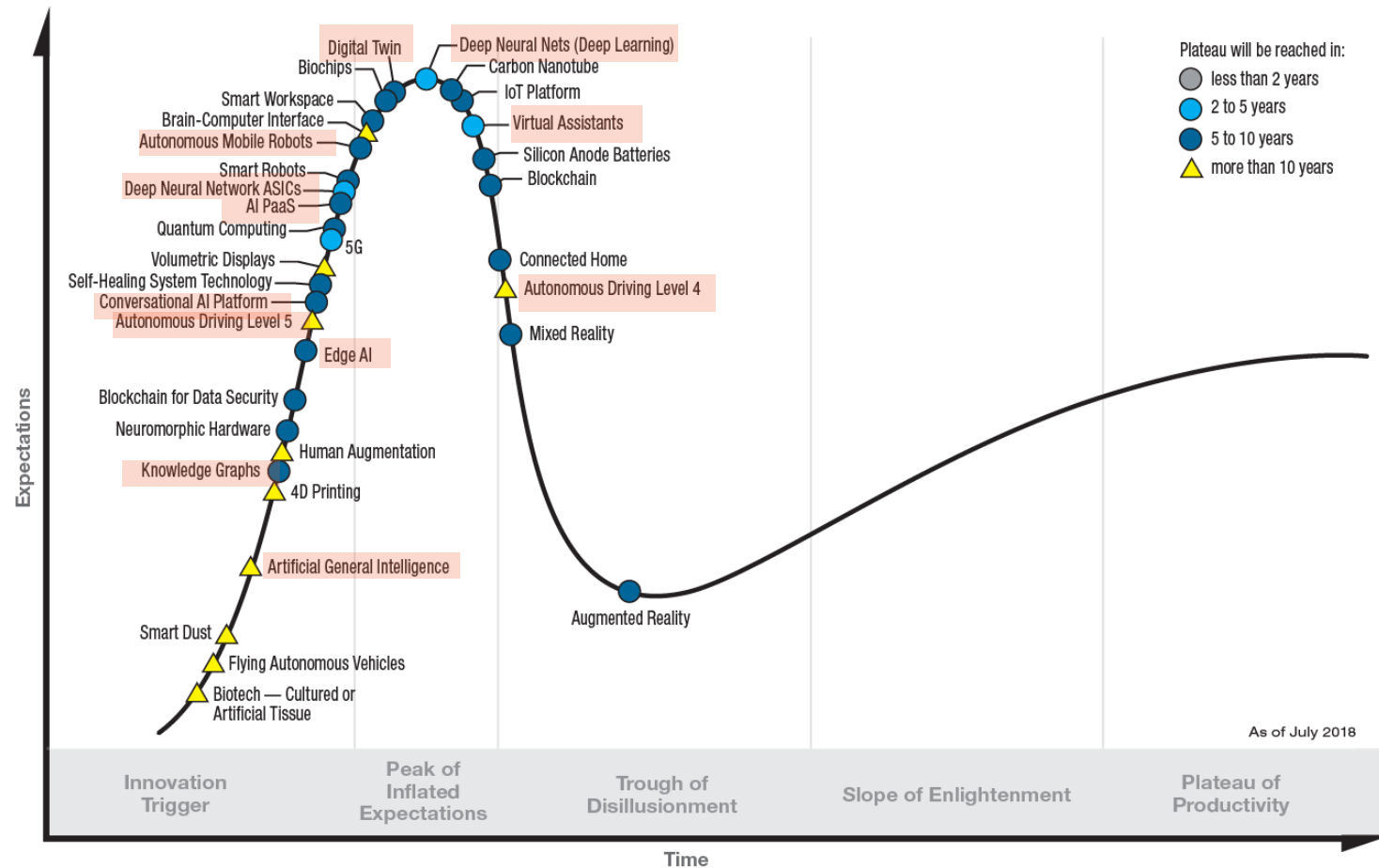
Artificial Intelligence in Aviation

Trends and challenges

David Pérez



Hype Cycle for Emerging Technologies, 2018



gartner.com/SmarterWithGartner

Source: Gartner (August 2018)

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Gartner



Neural Machine Translation

<https://www.nytimes.com/2016/12/14/magazine/the-great-ai-awakening.html>

<https://arxiv.org/abs/1710.11041>

Speech/image recognition and synthesis - consumer/professional

Check, for instance, WaveNet, FaceNet, DeepFace, Rekognition,...

DeepMind defeats Master of Go Lee Se-dol

www.netflix.com/es-en/title/80190844

Industry addresses the driverless car

Check, for instance, drive.ai

Google Duplex is a prototype of a conversational AI platform

www.youtube.com/watch?v=IXUQ-DdSDoEi

Database indexing

<https://arxiv.org/abs/1712.01208>

Data Science in aviation

2013

1st Data Science in Aviation Workshop

2018



2013

1st Data Science in Aviation Workshop

datascience.aero/data-science-workshop-2013-event



Usage of data in ATM



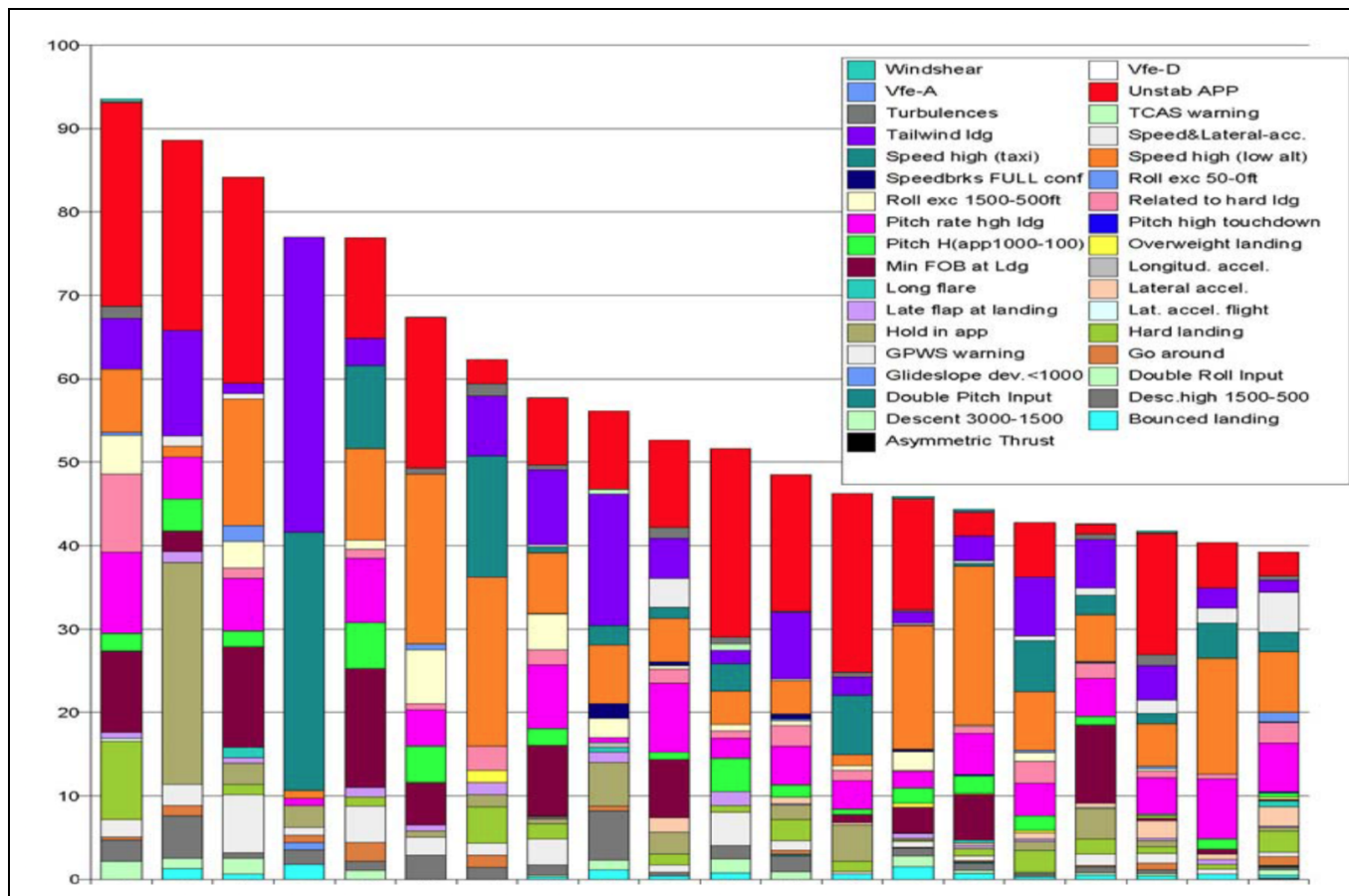
*... as a drunken man
uses lamp-posts*

*...for support rather
than illumination*

2018

2013

1st Data Science in Aviation Workshop



2018

What about aviation?

2013

1st Data Science in Aviation Workshop

- few datasets available; no data fusion
- few efforts on computing architectures
- simple statistical analysis; not very complex use cases
- simple visualisation techniques
- data protected by not sharing

2018

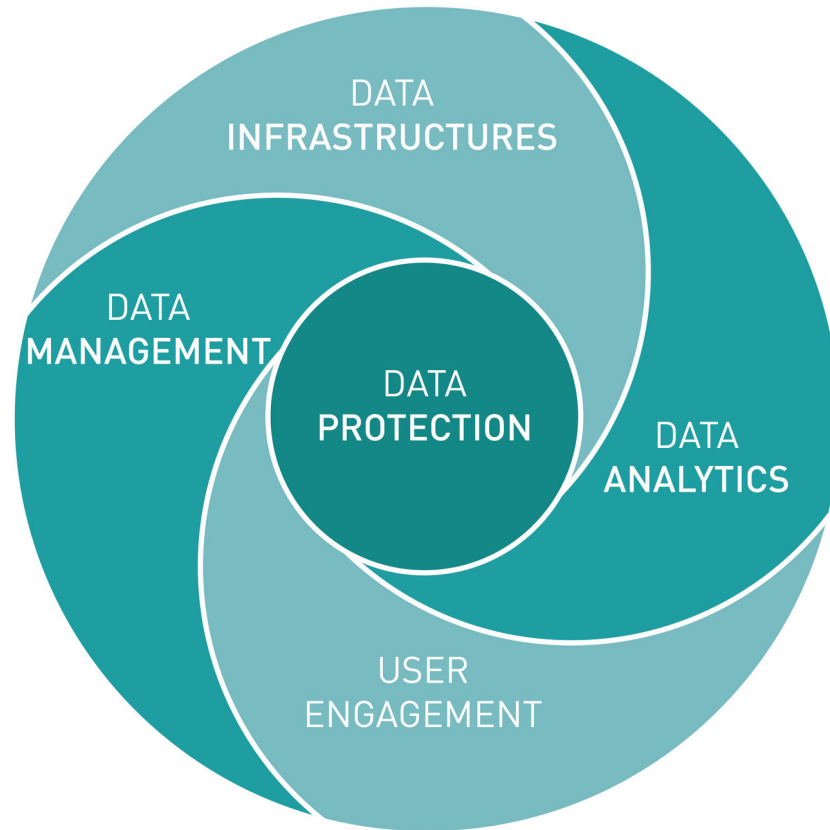
Now and the future

2013

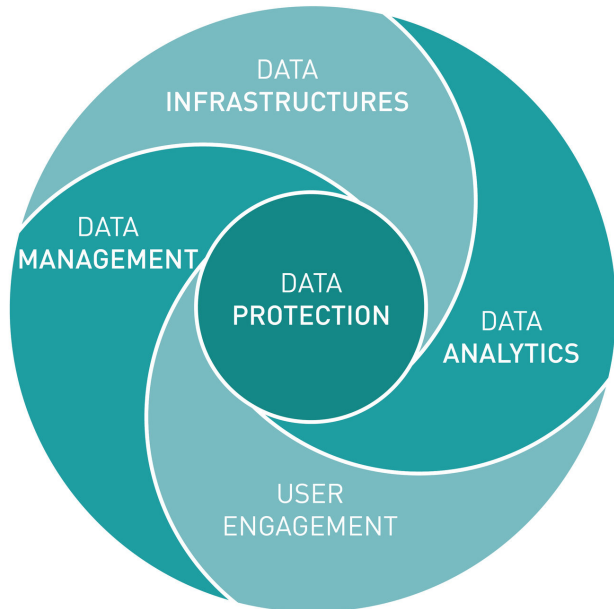


2018

6th Data Science in Aviation Workshop



2018



Data Management

Data **availability** has improved, not perfect

Not generally available **training** data

Data process know-how/software **proprietary**

Data **fusion** is becoming relevant

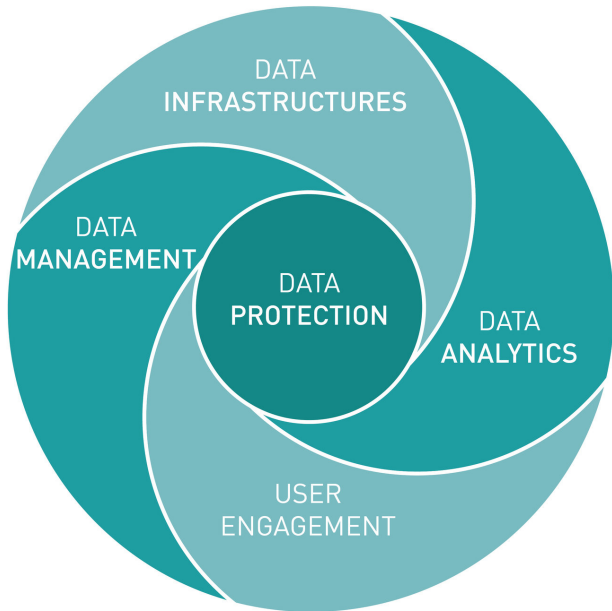
We need to see more data access

Training data is the new "new oil"

Train data needs to be less costly

Data curation

2018



Data Infrastructures

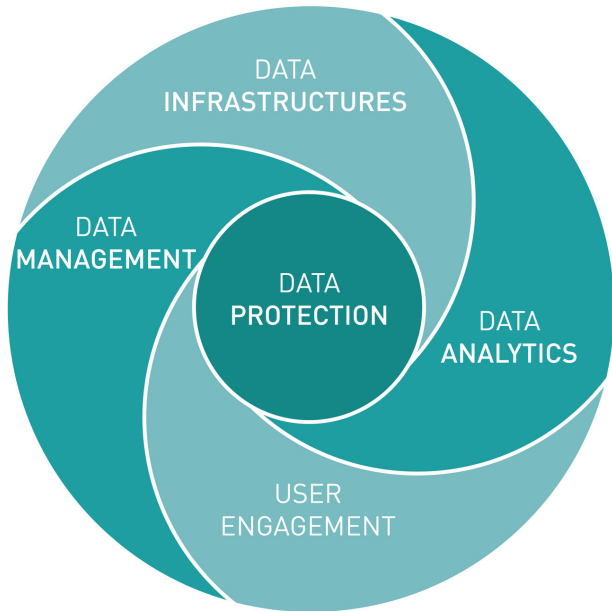
Cloud-based - scalable, cost efficient

Not an **AI-PaaS** ready just yet

"Inflation" of **data platforms** in aviation

We need to see hybrid architectures,
communication between platforms

2018



Data Analytics

Very promising results using ANN

Performance still to be improved, understood and monitored

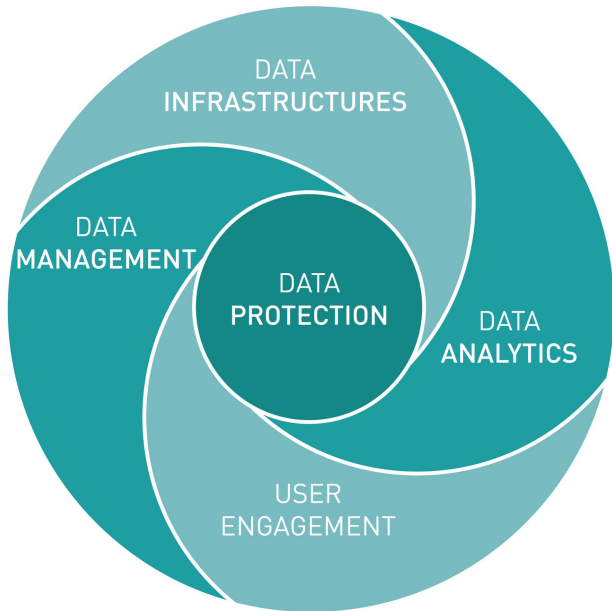
We need to see

Collaborative environments - Jupyter

Distributed learning

Software 2.0 stack for aviation?

2018



User Engagement

Some use cases formalized

Visualisation platforms widely available

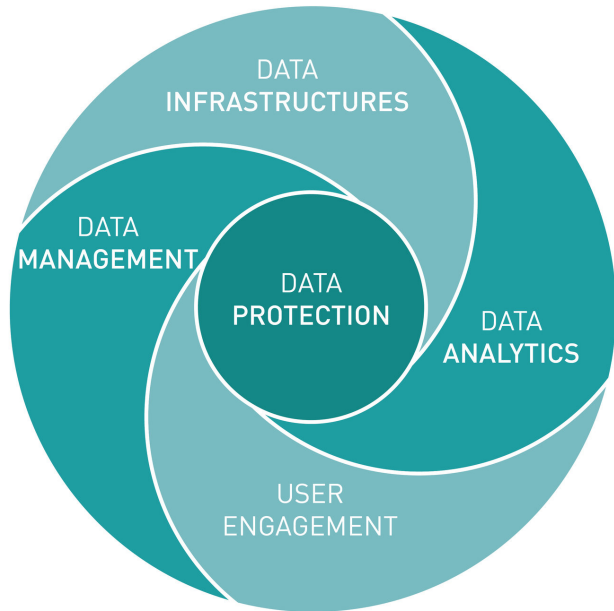
New experimental visualisation tools

No industrial implementations yet

We need to see new procedures integrating ML solutions

"Business translators"

2018



Data Protection

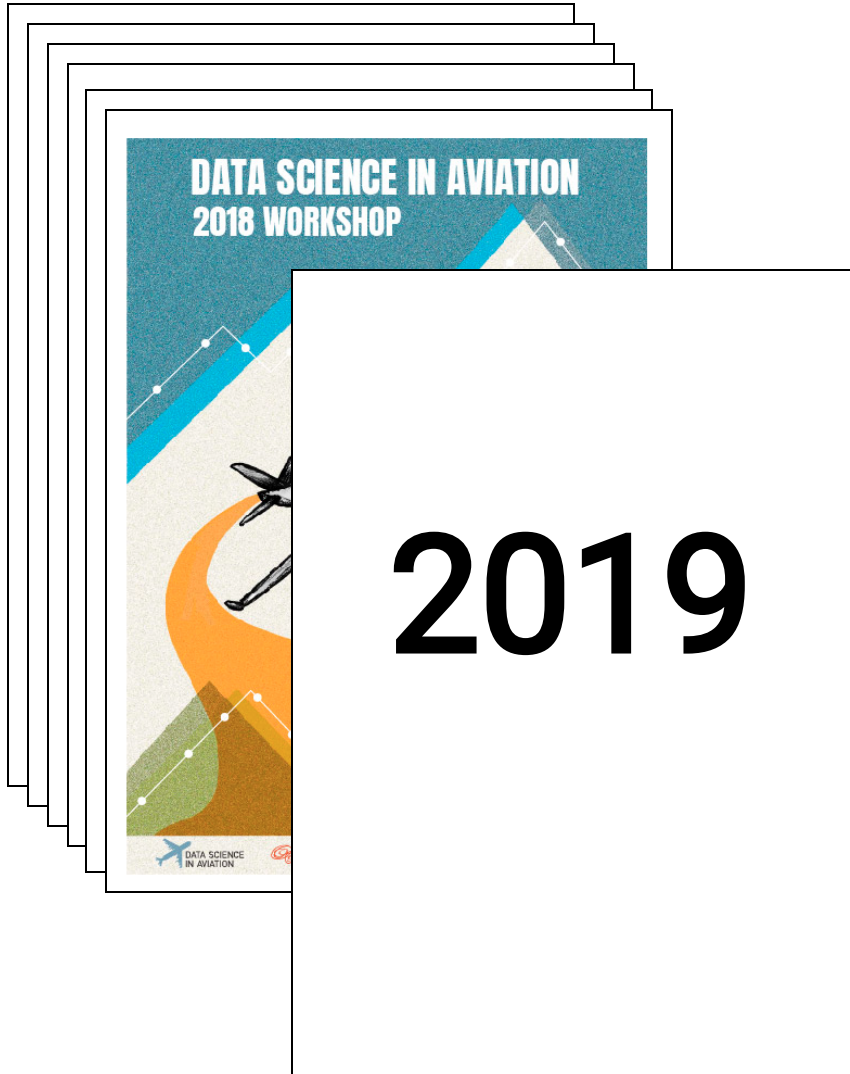
Data privacy more important than ever

Poor methods, in general

Simple de-identification, at most

First applicability of crypto technologies

We need to see "privacy by design"



Safety

Mobility

Predictability

Environment

MRO

Tools, infrastructures

Visualization

...

Thank you!

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