MACHINE LEARNING WORKFLOWS FOR APPLICATION DEVELOPERS

Sophie Watson • @sophwats • sophie@redhat.com
William Benton • @willb • willb@redhat.com
Michael McCune • @FOSSJunkie • elmiko@redhat.com
What you’ll learn today

Processes and principles to solve problems with ML

Some tricks to visualize complex data

How to train, evaluate, and deploy ML models

How OpenShift makes it all easier

#redhat #rhsummit
Legal disclaimer

The content set forth herein does not constitute in any way a binding or legal agreement or impose any legal obligation or duty on Red Hat. This information is provided for discussion purposes only and is subject to change for any or no reason.
Forecast

What is machine learning?

What workflow do machine learning practitioners use?

How can we incorporate machine learning into apps?

What do we have to look forward to?
What is machine learning?
Machine learning is a family of techniques to automatically derive executable functions from example inputs and outputs.
Machine learning workflows
Machine learning checklist

Example data

A training objective and a business metric

A concrete learning technique

A way to encode data
codifying problem and metrics

data collection and cleaning
data collection and cleaning

feature engineering

model training and tuning
data collection and cleaning

feature engineering

model training and tuning
model validation

model deployment

monitoring and validation
feature engineering
model training and tuning
model validation
model deployment
monitoring and validation
codifying problem and metrics
data collection and cleaning
feature engineering
model training and tuning
model validation
model deployment
monitoring and validation
feature engineering
model training and tuning
model validation
model deployment
monitoring and validation
codifying problem and metrics
data collection and cleaning
feature engineering
model training and tuning
model validation
model deployment
monitoring and validation
Machine learning, apps, and OpenShift
Immutable images

- User application code: a6af91e, 6b8cad3e
- Configuration and installation recipes: 33721112, e8caef6, 2bb6ab16, a8296f7e, 979229b9
- Base image
Stateless microservices
Stateless microservices
Stateless microservices
Stateless microservices
Declarative app configuration
Declarative app configuration

https://summit.radanalyticslabs.io
Integration and deployment
Integration and deployment
Integration and deployment

OK!

application code
configuration and installation recipes
base image
Integration and deployment

OK!

- base image
- configuration and installation recipes
- application code
Integration and deployment

- application code
- configuration and installation recipes
- base image
Data drift
Data drift
Looking forward
Other frameworks

#redhat #rhsummit
radanalytics.io
Open Data Hub
Other technologies

\[ x \cdot y = x_1 \cdot y_1 + \cdots + x_n \cdot y_n \]
Other technologies

\[ x \cdot y = x_1 \cdot y_1 + \cdots + x_n \cdot y_n \]

```python
def dot(xs, ys):
    return sum([x * y for x, y in zip(xs, ys)])
```
Other technologies

\[ x \cdot y = x_1 \cdot y_1 + \cdots + x_n \cdot y_n \]

def dot(xs, ys):
    return sum([x * y for x, y in zip(xs, ys)])

dot([0.1, 0.2, 0.3], [1.0, 2.0, 3.0])
def dot(xs, ys):
    return sum([x * y for x, y in zip(xs, ys)])
```python
def dot(xs, ys):
    return sum([x * y for x, y in zip(xs, ys)])
```
Other technologies
Other technologies
Other technologies
Other technologies
Other technologies

#redhat #rhsummit
Conclusions
THANKS!

@sophwats • @willb • @FOSSJunkie