AWS re:Invent

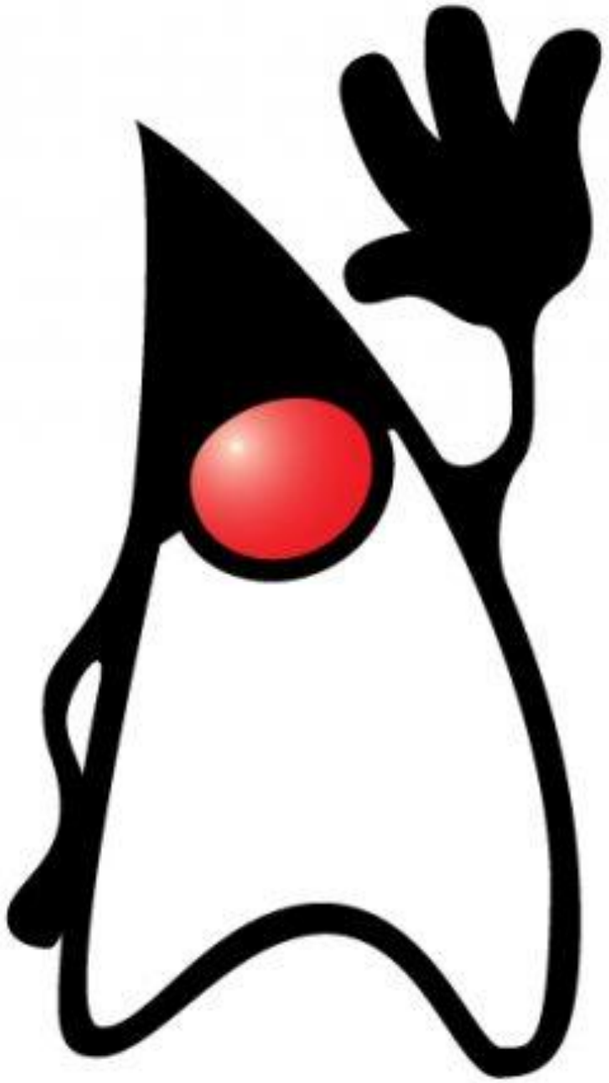
CMY201

Future-proof your career: Java developer to machine-learning practitioner

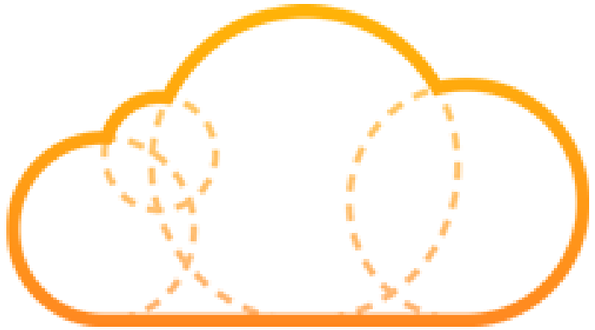
Kesha Williams
AWS Technical Instructor
A Cloud Guru

AWS re:Invent

aws



aws



alexa
Champion

About me

- Full-stack web developer
- 2017 machine learning
- DJL (Deep Java Library)
- Amazon SageMaker
- AWS DeepLens
- Amazon Rekognition

Agenda

Java to machine learning

Getting started

Challenges faced

Lessons learned

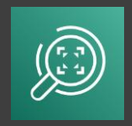
Q&A

Getting started

My machine learning journey

Level 1 adoption

AI services

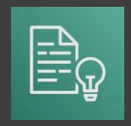

Rekognition


Polly


Lex


Personalize


Forecast


Comprehend


Translate

Level 2 adoption

ML services


Amazon ML


SageMaker


Ground Truth


Notebook


Model


Train

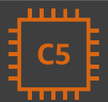
Algorithms + Marketplace | Training | Optimization | Deployment | Hosting

Level 3 adoption

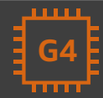
Toolkits + ML frameworks + interfaces + infrastructure

DJL

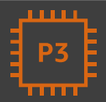

Amazon EC2



C5 instance



G4 instance



P3 instance

What kind of footwear is this?

Boots

Shoes

Sandals

Slippers

DJL

mxnet

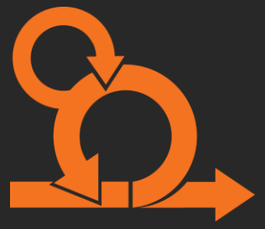
Level 3

How I tackled solving the problem

Traditional software development

User

Interact with data



Agile

Sprints

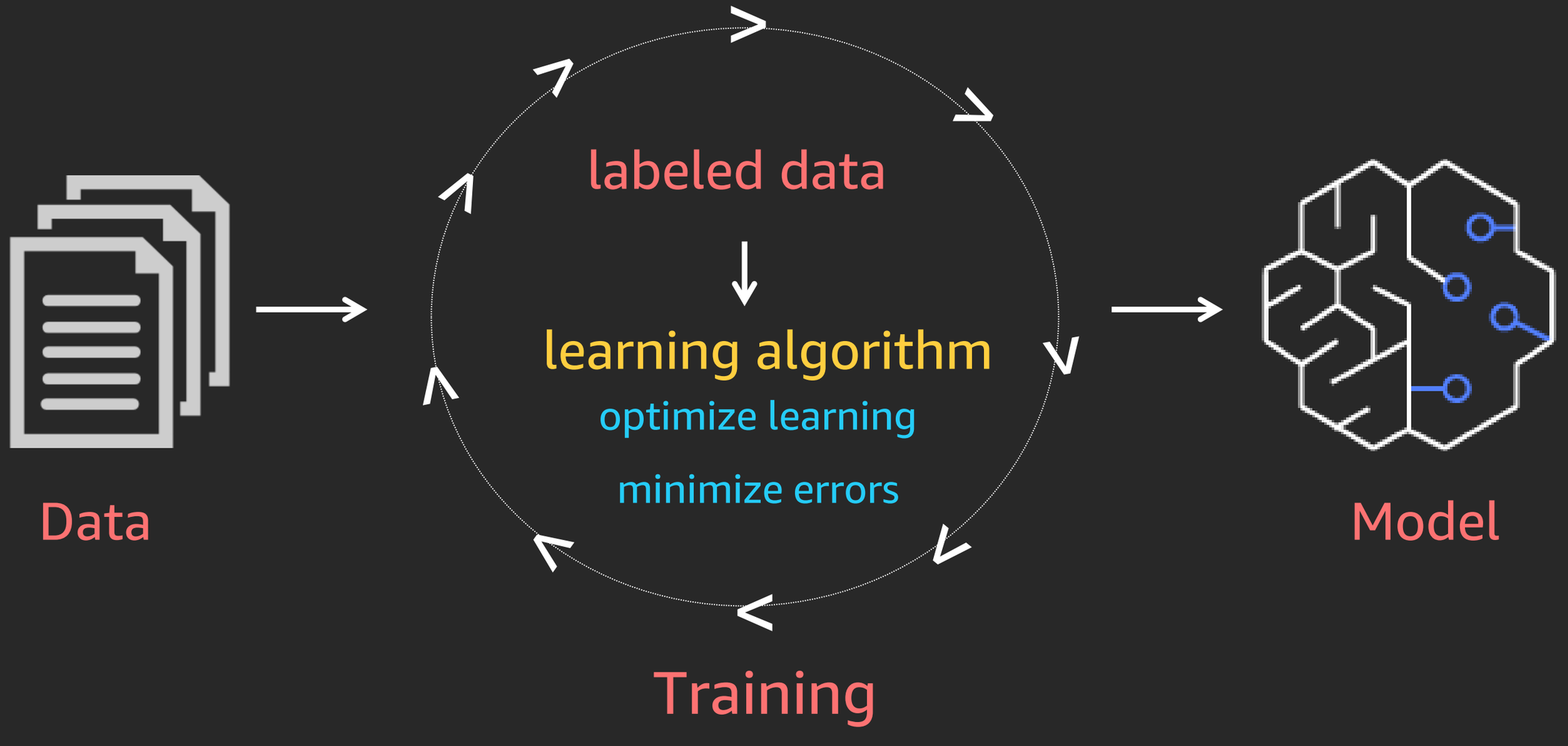
GUI

Display data

APIs

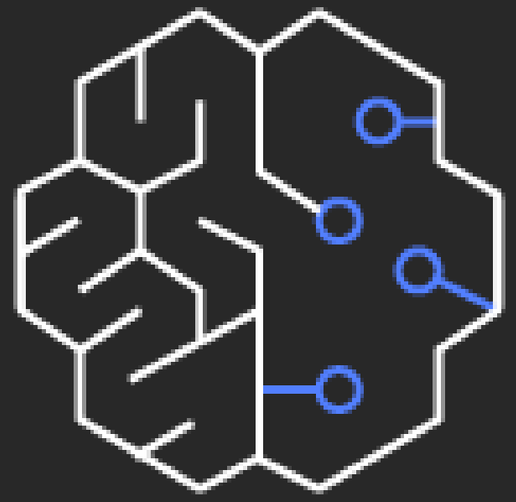
Retrieve data

ML model development



What kind of footwear is this?

Footwear



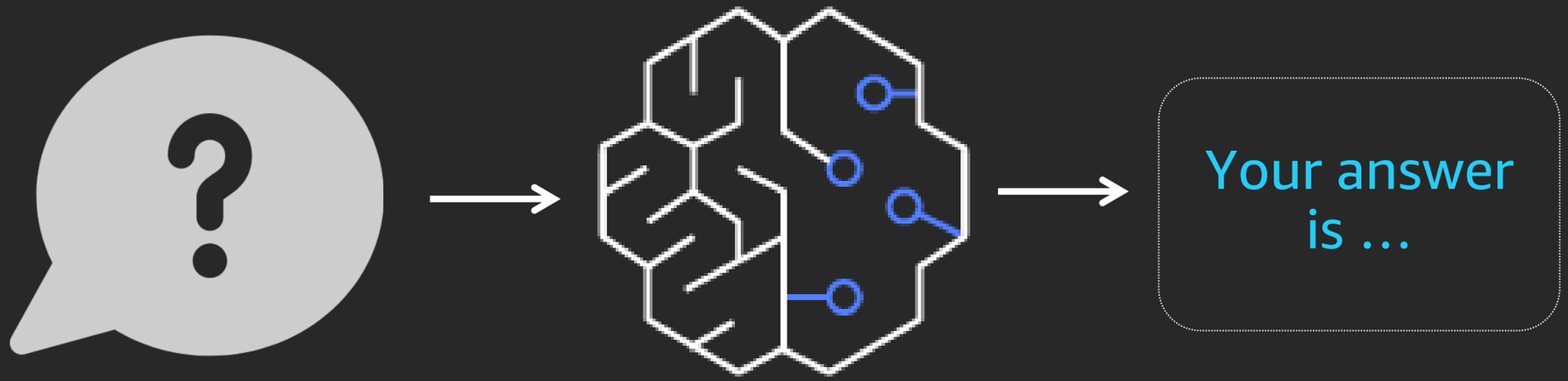
Model

Slippers

Prediction

The model

The model is a mathematical representation of trends and patterns found in data.



Question

Model

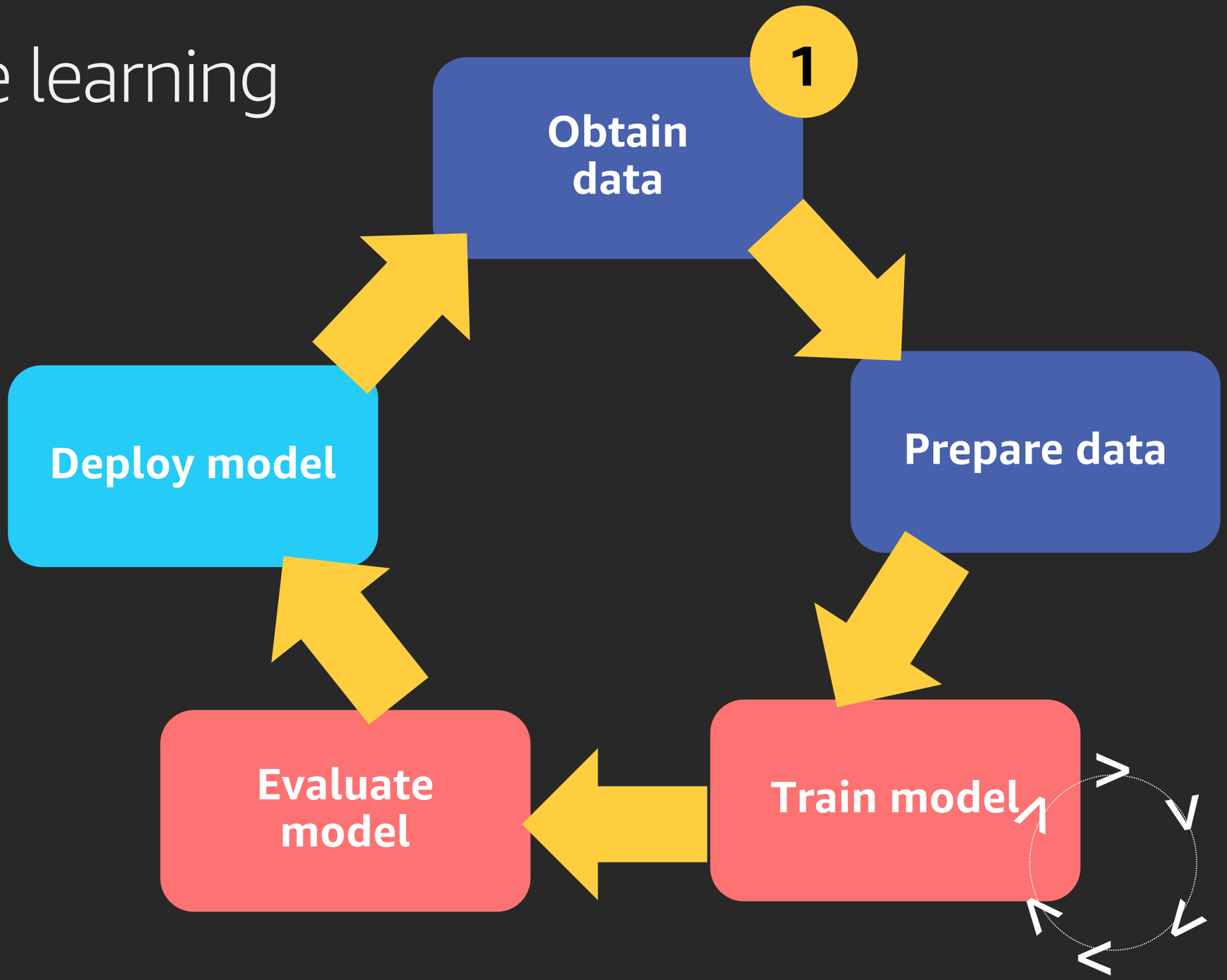
Prediction

Binary classification

Multiclass classification

Regression

Machine learning lifecycle



The data

Data

- Reputable data source
- Domain knowledge
- Clean and format data
- Prepare and transform data
- Check for bias

Footwear classification model

Deep Java Library (DJL) Overview

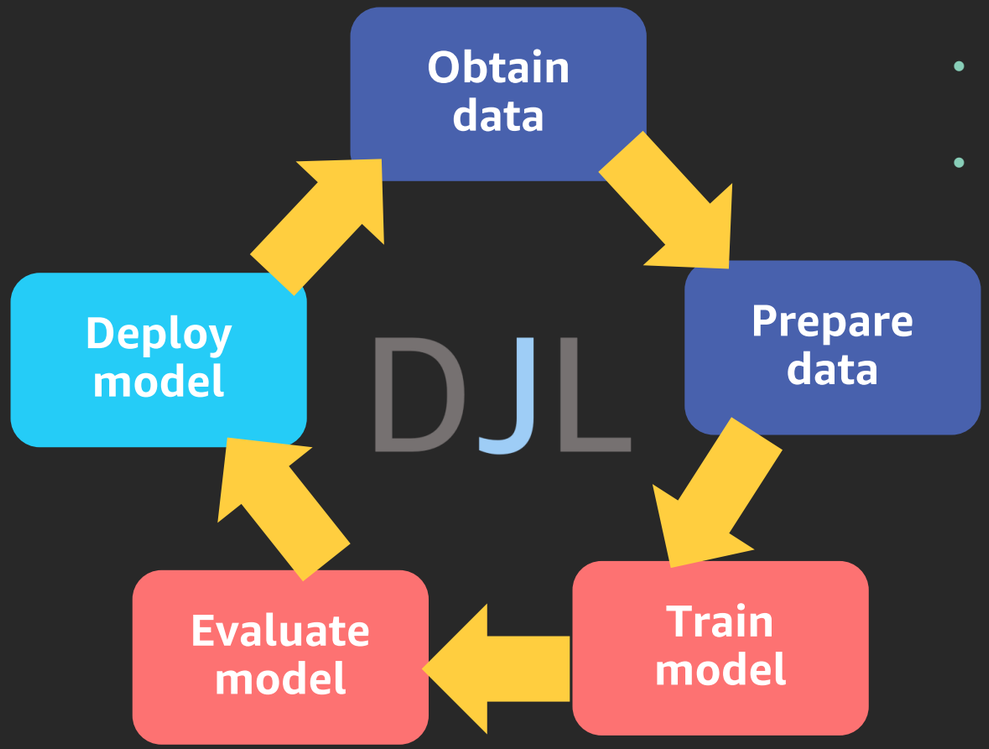
Deep learning toolkit for Java developers

Inference

- Single or batch predictions
- Translators provide pre and post processing

Deploy

- Load model artifact to MXNet model zoo or load from local folder



Data

- Provides popular datasets out-of-the-box.
- Dataset class to retrieve data from a local folder or URL
- Dataset separates data into train and validation sets

Train

- Engine and framework agnostic
- Currently supports Apache MXNet
- Automatic CPU/GPU detection
- Easily set hyperparameters
- Evaluates model using validation training set
- Produces model artifact

Footwear classification data

Boots

Shoes

Sandals

Slippers

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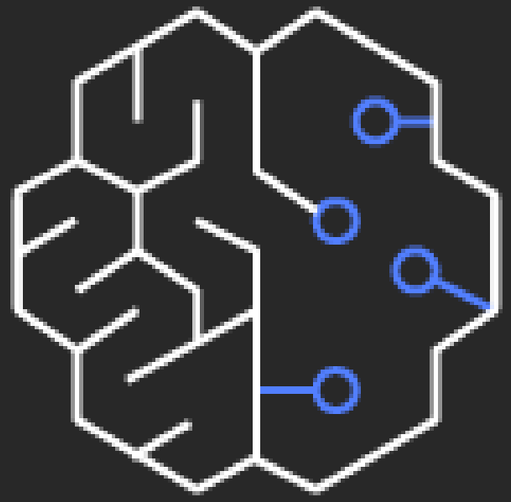


Model

[

class: "0", probability: 0.00003,

class: "1", probability: 0.01133,

class: "2", probability: 0.00179,

class: "3", probability: 0.98682

]

Prediction

Demo

Lessons learned

Lessons learned

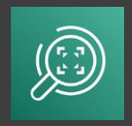
- Machine learning is very approachable using AWS
- DJL makes it super easy for Java developers to transition to ML
- Understand the machine learning lifecycle and common ML terms
- Domain knowledge is more important than being an ML expert
- Software engineering knowledge helps

What’s next for you?

Your journey

Level 1 adoption

AI services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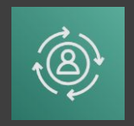
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C5 instance


G4 instance


P3 instance

Practical pathway

1. Understand the machine learning lifecycle and terminology
2. Start with supervised learning with binary or multiclass classification
3. Identify your first use case (something fun)
4. Find data and gain domain knowledge of data
   - Kaggle
   - UCI Machine Learning Repository
5. Train model using DJL
6. Blog about your journey

Code samples

- Footwear classification code
  - http://bit.ly/deep-java
- Footwear classification article
  - http://bit.ly/dj-footwear
- DJL JavaDoc
  - https://djl-ai.s3.amazonaws.com/java-api/0.1.0/index.html

Q&A

Thank you!

Kesha Williams

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@KeshaWillz

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