

SEOUL

19.09.26

DEV DAY



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모두를 위한 컴퓨터 비전 딥러닝 툴킷, GluonCV 따라하기

3. AWS DeepLens

김무현 데이터 사이언티스트
Amazon Machine Learning Solutions Lab



AWS DeepLens
is not a
video camera ...

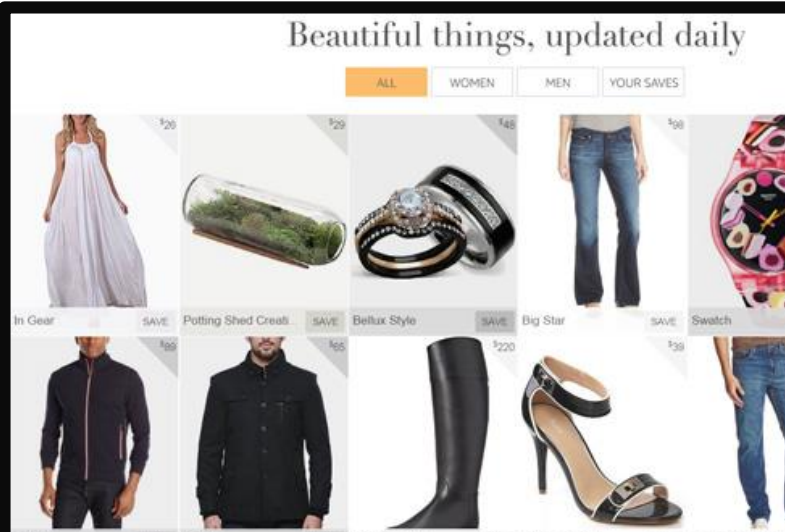
It's the
world's first
**deep learning-enabled
developer kit**



AWS DeepLens Specifications



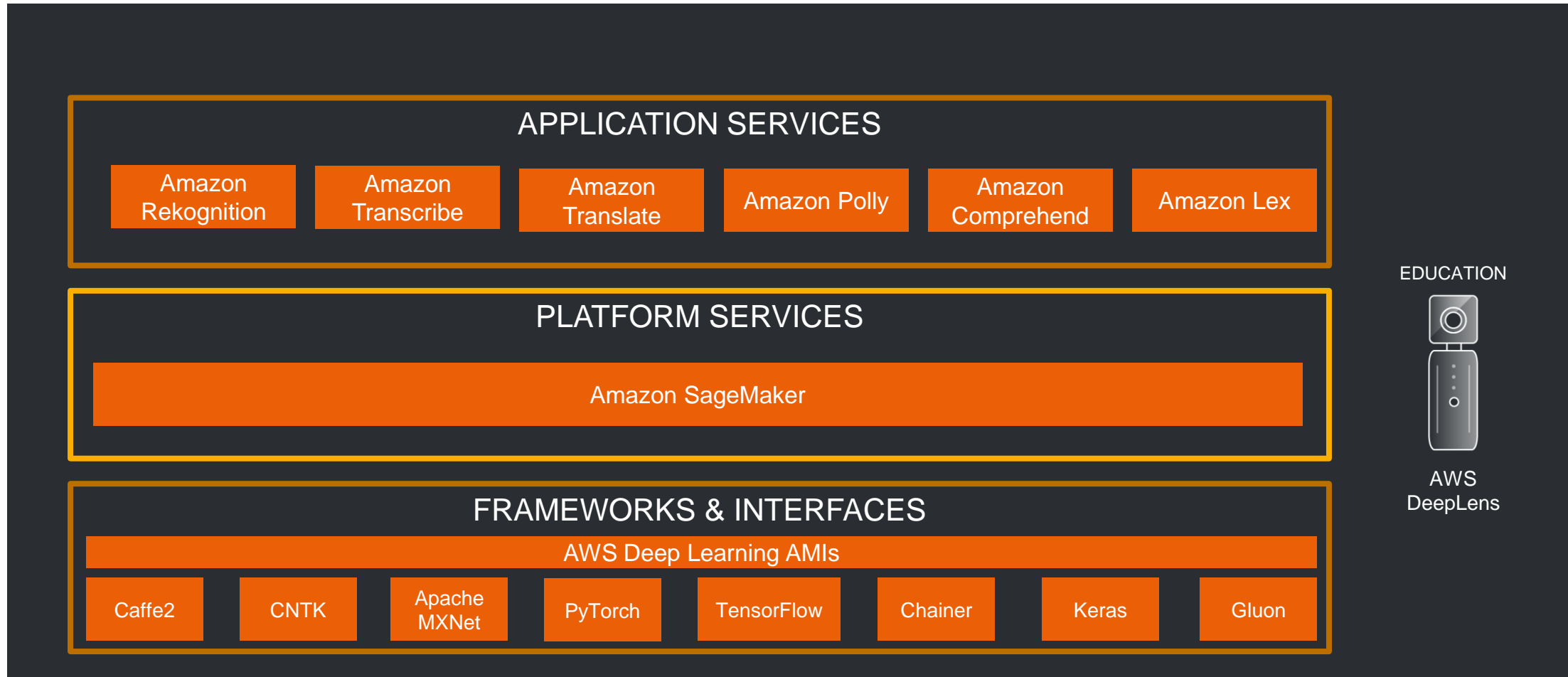
- Intel Atom Processor
- Gen9 graphics
- Ubuntu OS- 16.04 LTS
- 100 GFLOPS performance
- Dual band Wi-Fi
- 8-GB RAM
- 16-GB storage (eMMC)
- 32-GB SD card
- 4 MP camera with MJPEG
- H.264 encoding at 1080p resolution
- 2 USB ports
- Micro HDMI
- Audio out
- AWS Greengrass preconfigured
- Intel cLDNN Optimized for MXNet



Artificial Intelligence at Amazon



The Amazon Machine Learning Stack



Get Started with Sample Projects

HOT DOG / NOT HOT DOG



OBJECT DETECTION



FACE DETECTION



ACTIVITY DETECTION



HEAD POSE DETECTION



ARTISTIC STYLE TRANSFER



CAT VS. DOG



Or build custom deep learning models in the cloud using
Amazon SageMaker

Today We Will Cover

1. Machine learning overview



2. Deploy out-of-box model to AWS DeepLens



3. Training a model in Amazon SageMaker



4. Extending a project



AWS Lambda



Amazon S3

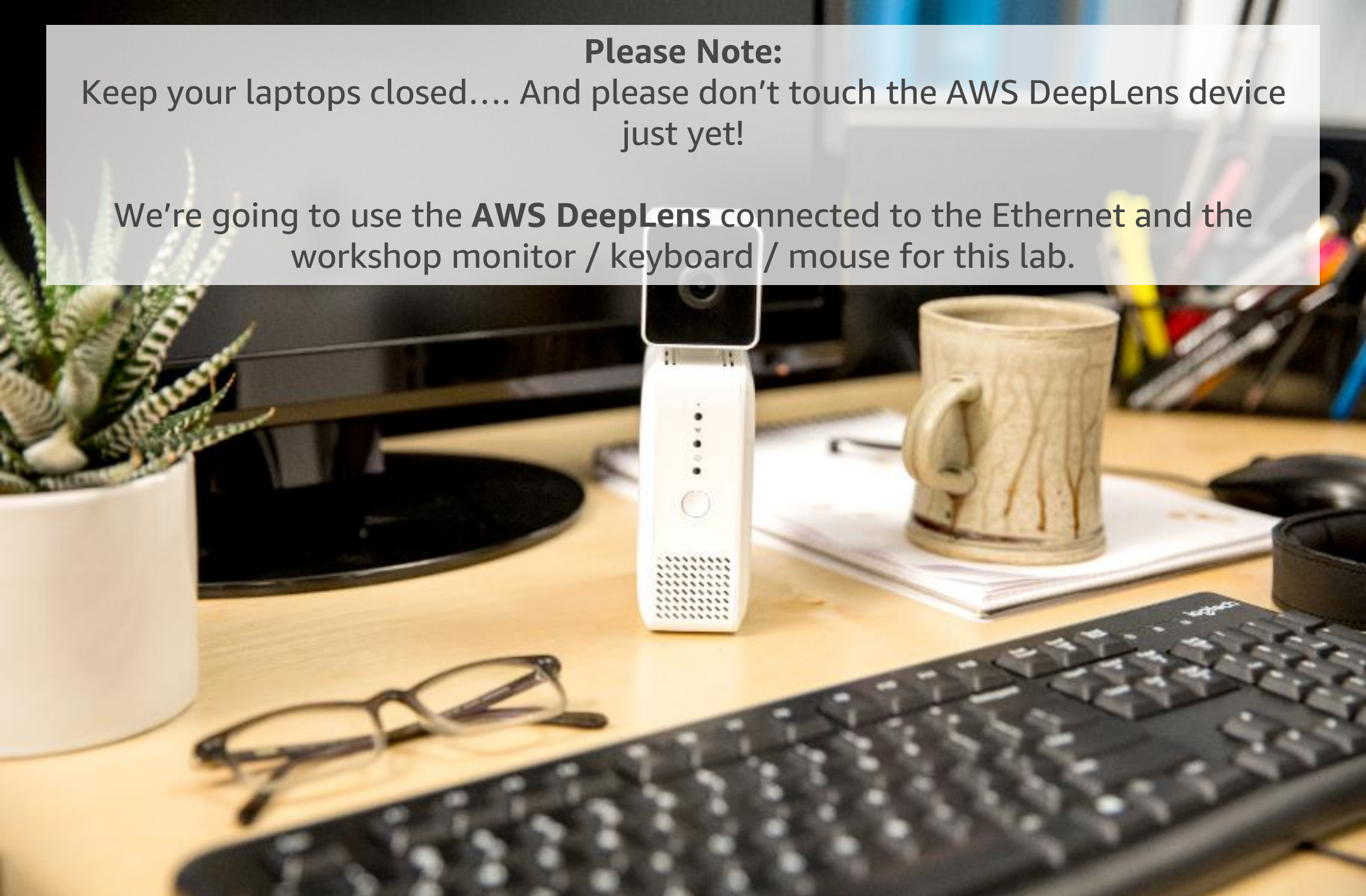


Amazon Rekognition

Please Note:

Keep your laptops closed.... And please don't touch the AWS DeepLens device just yet!

We're going to use the **AWS DeepLens** connected to the Ethernet and the workshop monitor / keyboard / mouse for this lab.



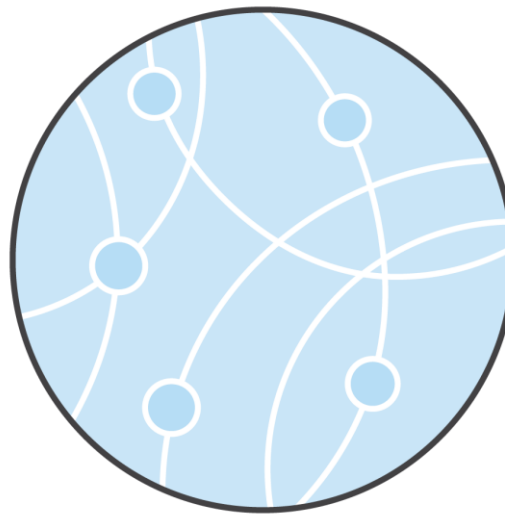
1. Machine Learning Overview



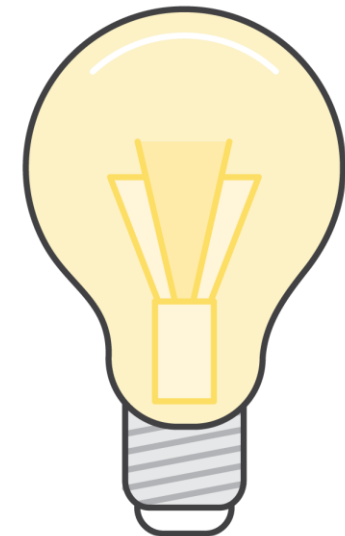
Overview of Deep Learning



Data

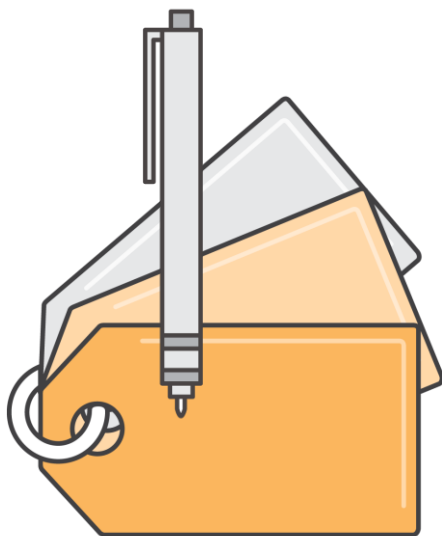


Model training

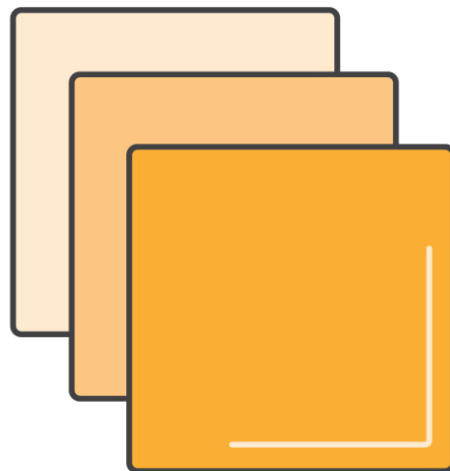


Inference

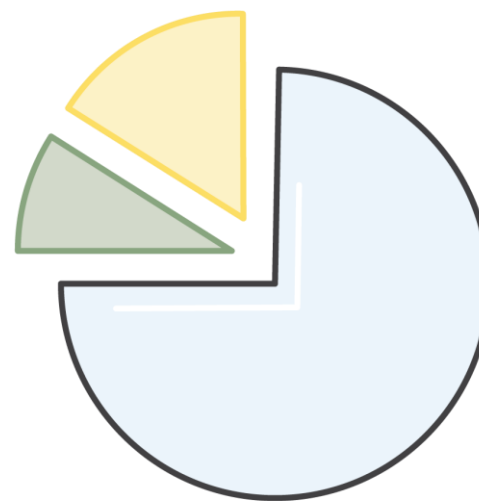
Data



Annotate



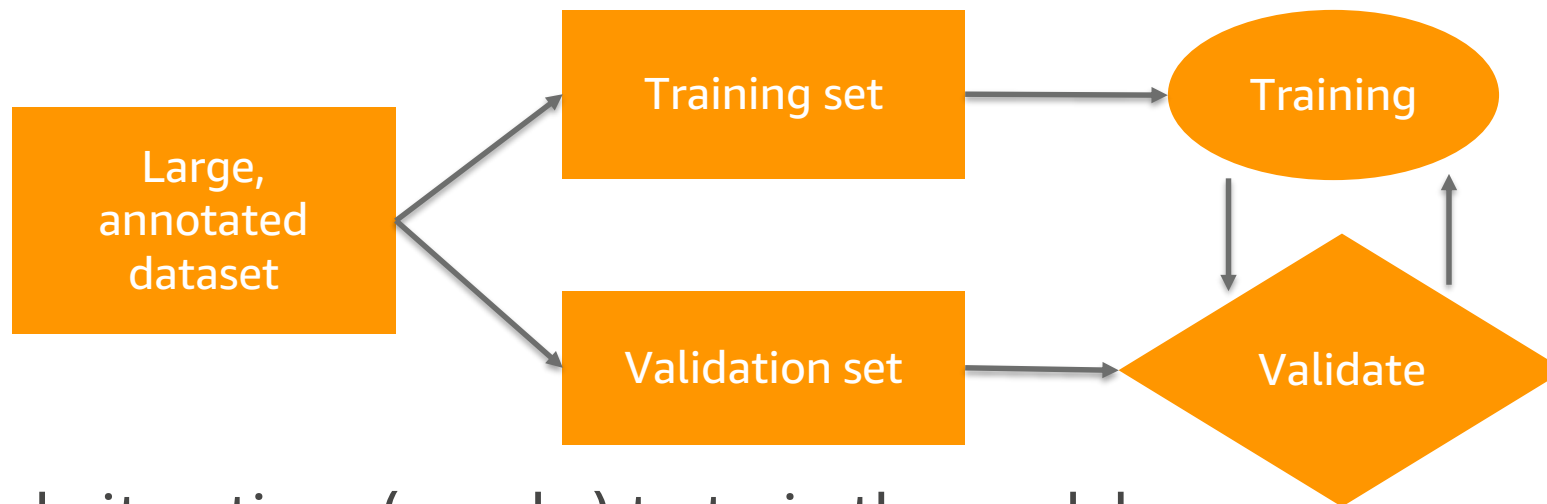
Preprocess



Data split

Model Training

- Define model architecture
- Input the annotated and cleaned data into the model



- Multiple iterations (epochs) to train the model
- Validate with held back dataset

Inference

It's where the magic happens!

1. Preprocess the new data or image just like a training set.
2. Feed image back to the trained model to get a predicted output.



2. Deploying an out-of-box model to AWS DeepLens

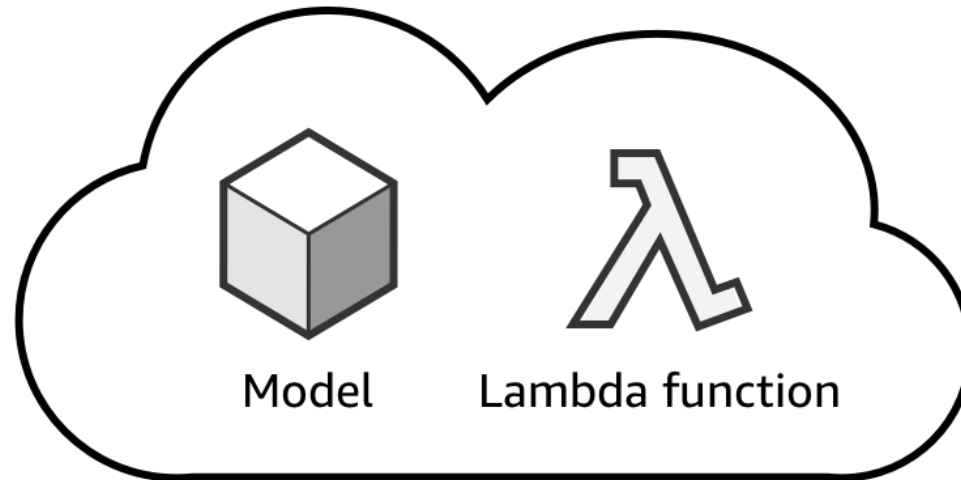


Under the Covers – Console

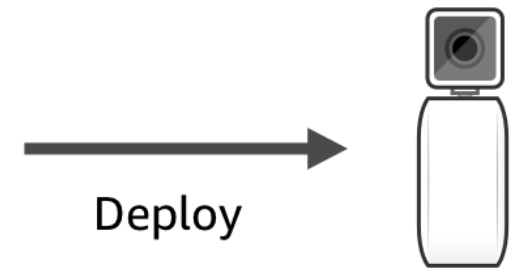
AWS DeepLens



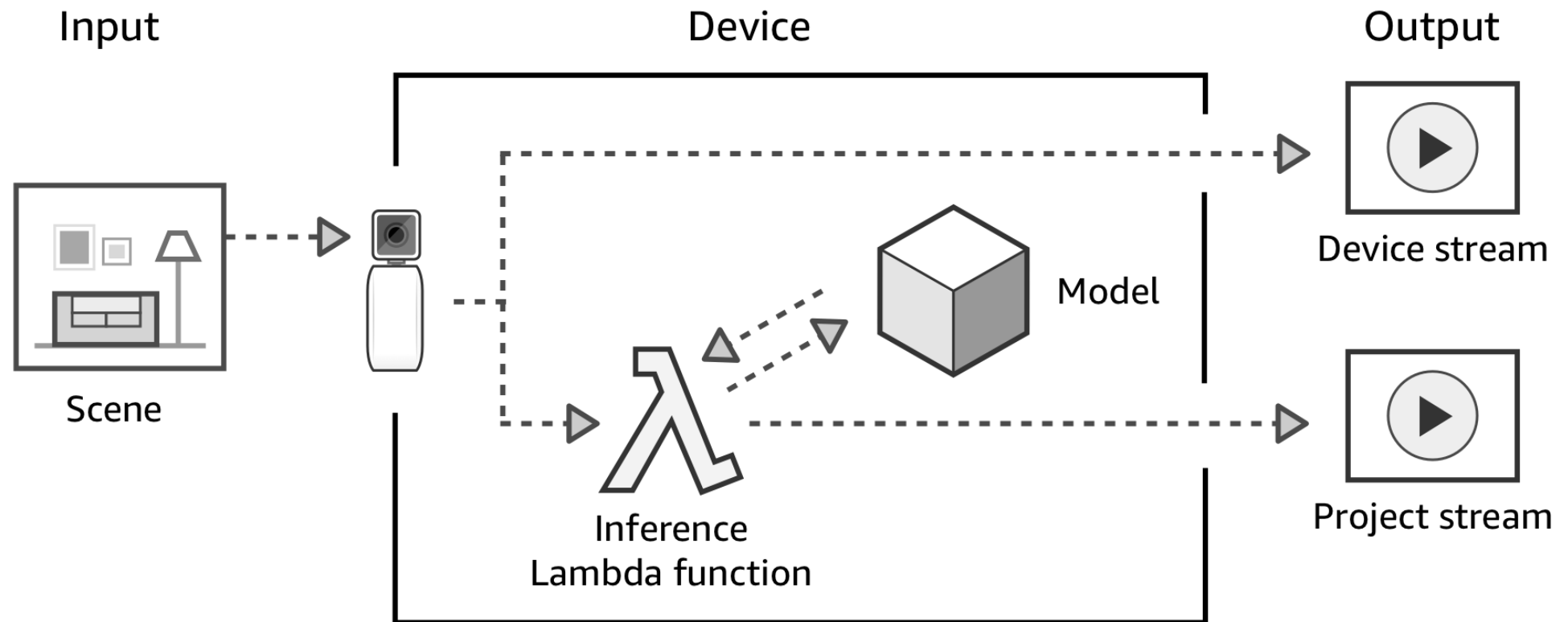
Create project / Deploy project



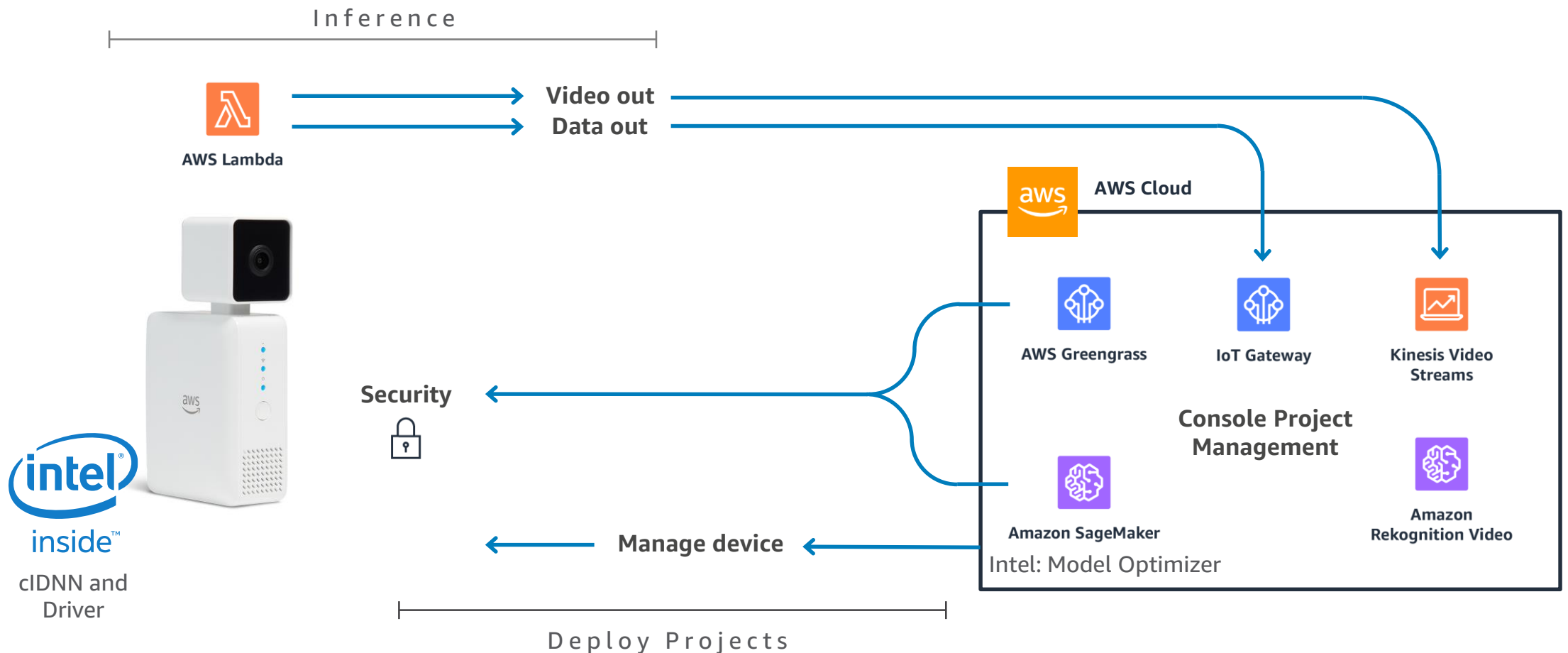
Device



Under the Covers – Device



AWS DeepLens Architecture



Lab #1: Deploying a Model to AWS DeepLens

- Objective: You will learn how to deploy a model
- Time: 40 min.
- Steps:



Follow along Instructions

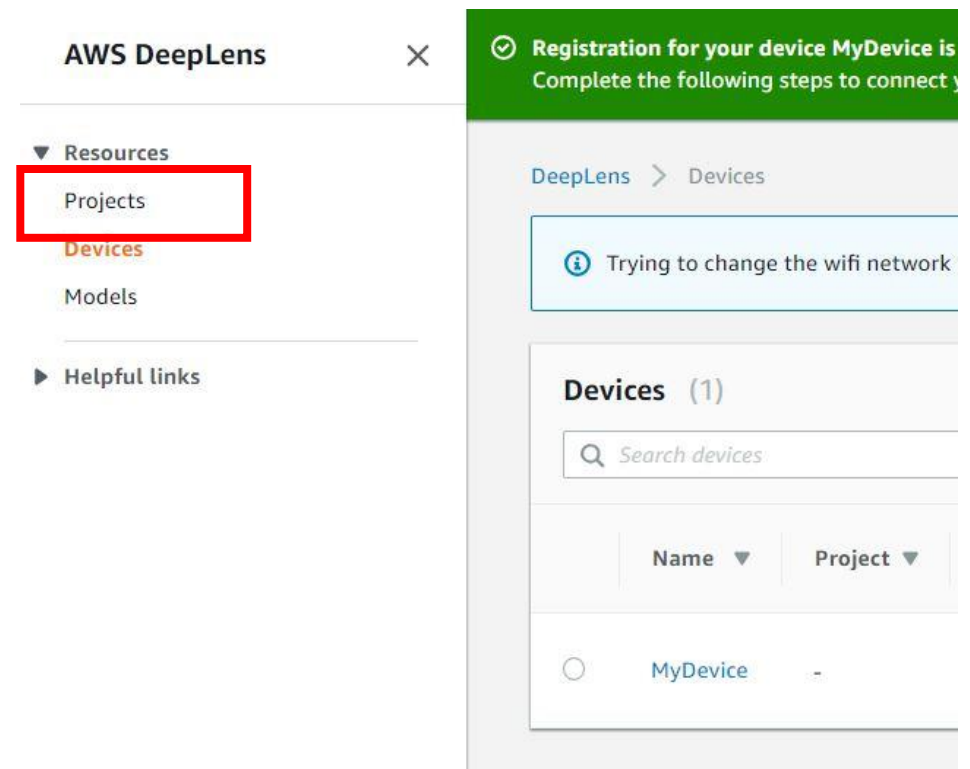
1. Find the instruction manual here:

<https://github.com/mahendrabairagi/DeeplensWorkshop/>

2. Select: Lab 1

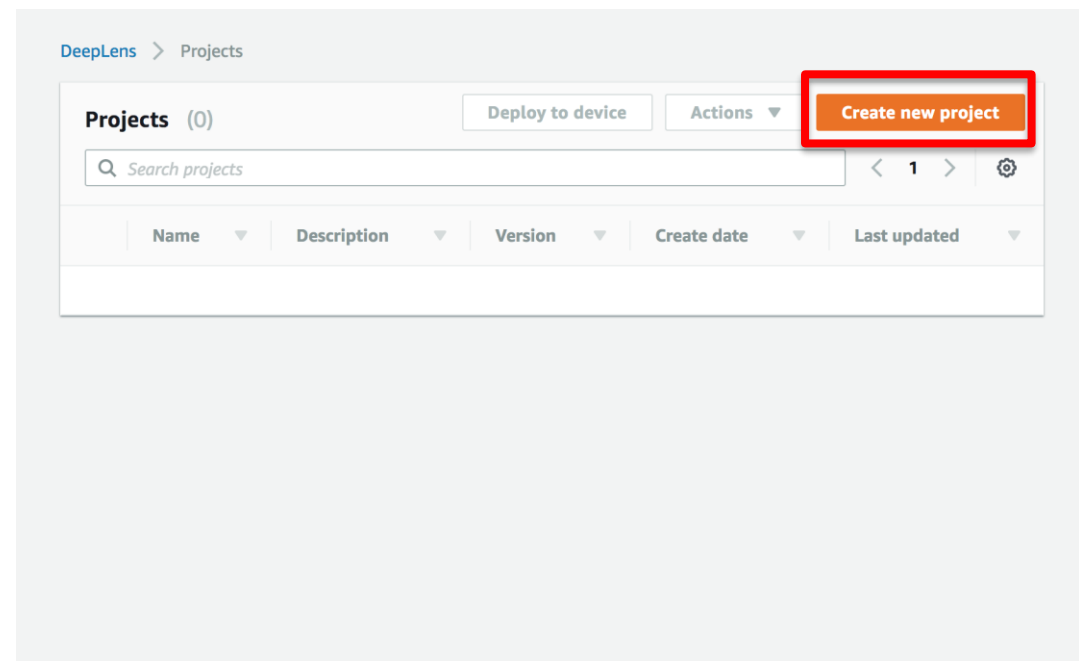
Now, It's Time to Create a Project

1. From the left navigation bar, choose **Projects**.



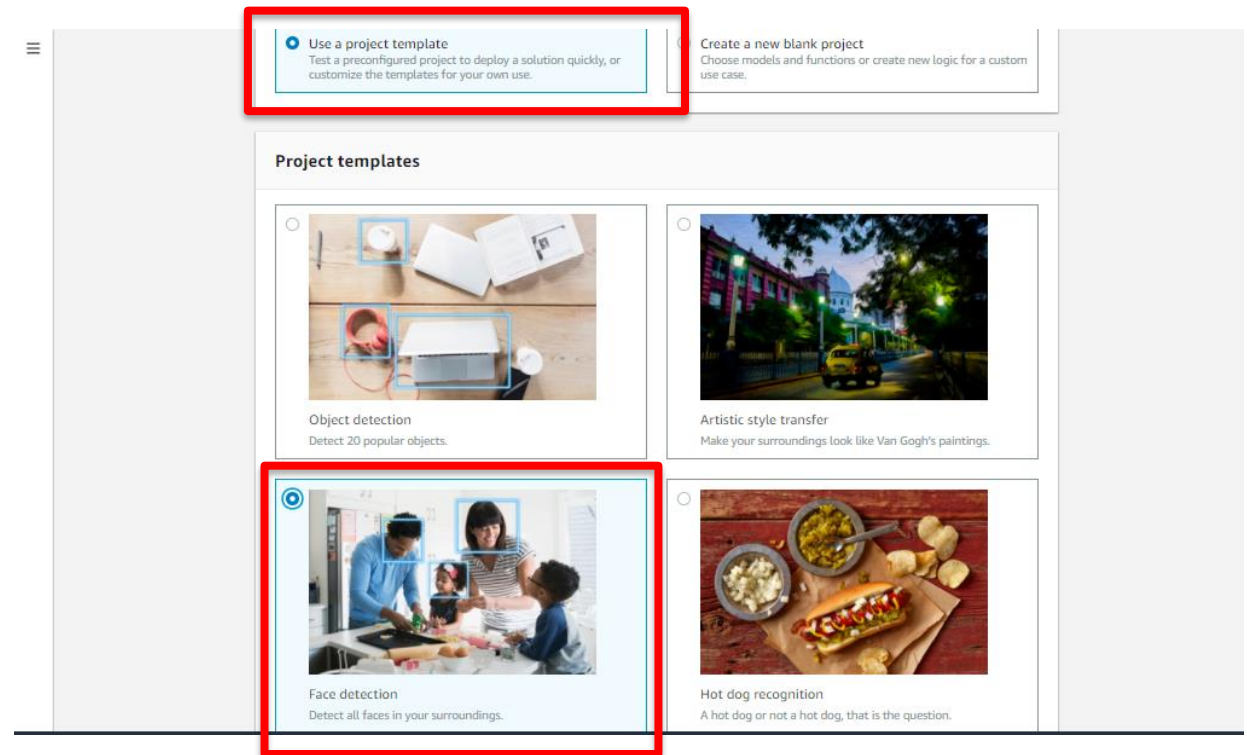
Now, It's Time to Create a Project

1. Choose **Create new project**.



Use a Face Detection Sample

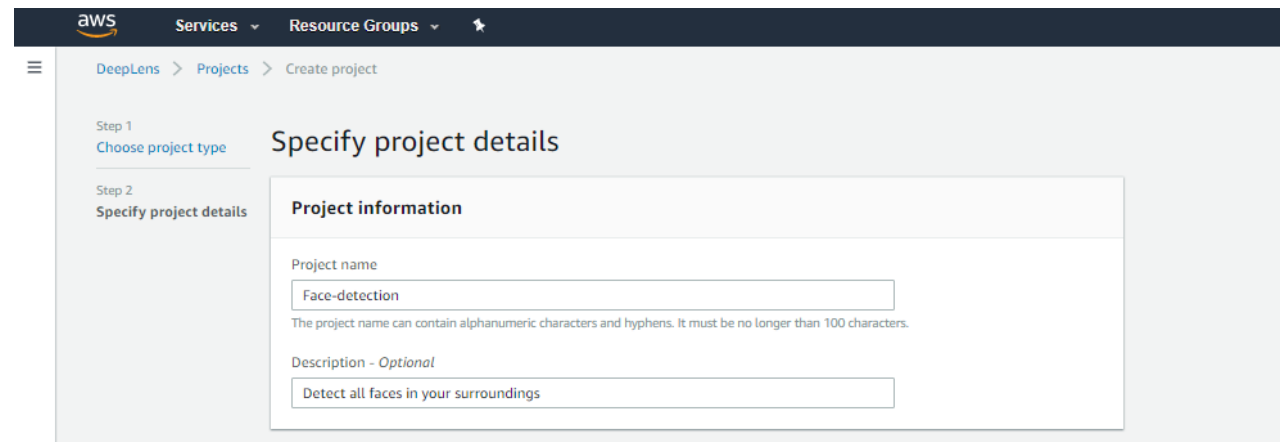
3. Choose **Use a project template**.
4. Choose **Face detection** from sample project templates.
5. Choose **Next** at the bottom of screen.



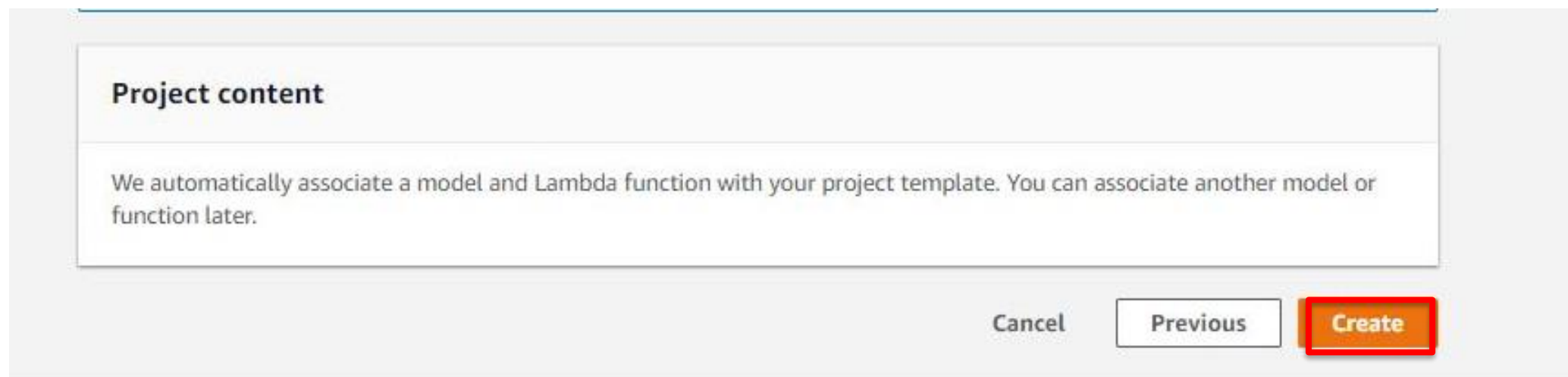
Create a Project

6. Choose **Create**.

It will take a few minutes to create the project.



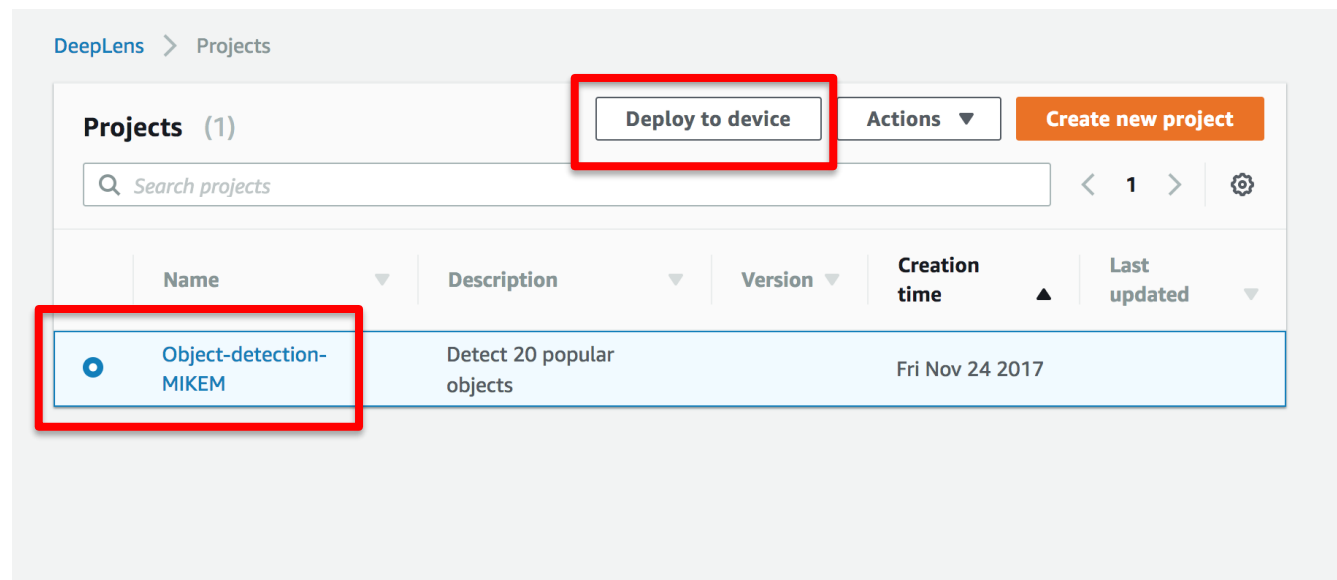
The screenshot shows the AWS DeepLens console interface. At the top, there's a navigation bar with 'aws', 'Services', and 'Resource Groups'. Below it, a breadcrumb trail reads 'DeepLens > Projects > Create project'. On the left, a sidebar indicates 'Step 1: Choose project type' and 'Step 2: Specify project details'. The main area is titled 'Specify project details' and contains a 'Project information' section. This section has two input fields: 'Project name' with the value 'Face-detection' and a description 'The project name can contain alphanumeric characters and hyphens. It must be no longer than 100 characters.', and 'Description - Optional' with the value 'Detect all faces in your surroundings'.



This screenshot shows the 'Project content' section of the AWS DeepLens console. It features a heading 'Project content' and a text block stating: 'We automatically associate a model and Lambda function with your project template. You can associate another model or function later.' At the bottom right, there are three buttons: 'Cancel', 'Previous', and 'Create'. The 'Create' button is highlighted with a red border and a red shadow, indicating it is the next step.

Deploy Project to the Device

7. Find your project in the list (the one you just named).
8. Choose the radio button.
9. Choose **Deploy to device**.



Target Your Device

10. Select your device.

11. Choose **Review**.

Target device

Choose the device you want to deploy your project to.

Devices (1)

< 1 > ⚙

Name ▼	Project ▼	Registration status ▼	Creation time ▲
<input checked="" type="radio"/> milleK9TB	-	✓ Completed	Fri Nov 24 2017

CancelReview

Deploy!

12. Choose **Deploy**.

A note on costs ...

Review and deploy

Deployment check

AWS DeepLens will deploy the project below to your device. Choose Deploy to continue.

New project: Object-detection-MIKEM

Type	Name
Lambda	[arn:aws:lambda:us-east-1:742969847900:function:deeplens-object-detection:1]
Model	deeplens-object-detection

Deployment will incur costs
AWS DeepLens uses various services to help deploy a project to your device. Costs will be aggregated and itemized for review in AWS Billing. [Learn more](#)

Cancel Previous **Deploy**

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Wait for the Project to Be Deployed

Blue banner = Deployment in progress

- 🔄 **Deployment of project Artistic-style-transfer, version 1.0 is in progress.**
Waiting for deployment workflow to begin.

Green banner = Deployment successful

- ✅ **Deployment of project Artistic-style-transfer, version 1.0 succeeded.**
Click on "View project stream" for instructions on how to view the filtered or transformed AWS DeepLens output.

Let's View the Output

You can view the output over the terminal or on the browser.
For the workshop, we will view the output over terminal

1. Open Terminal on Ubuntu desktop (on the desktop, choose the top left button and search for terminal).
2. Enter the following command:

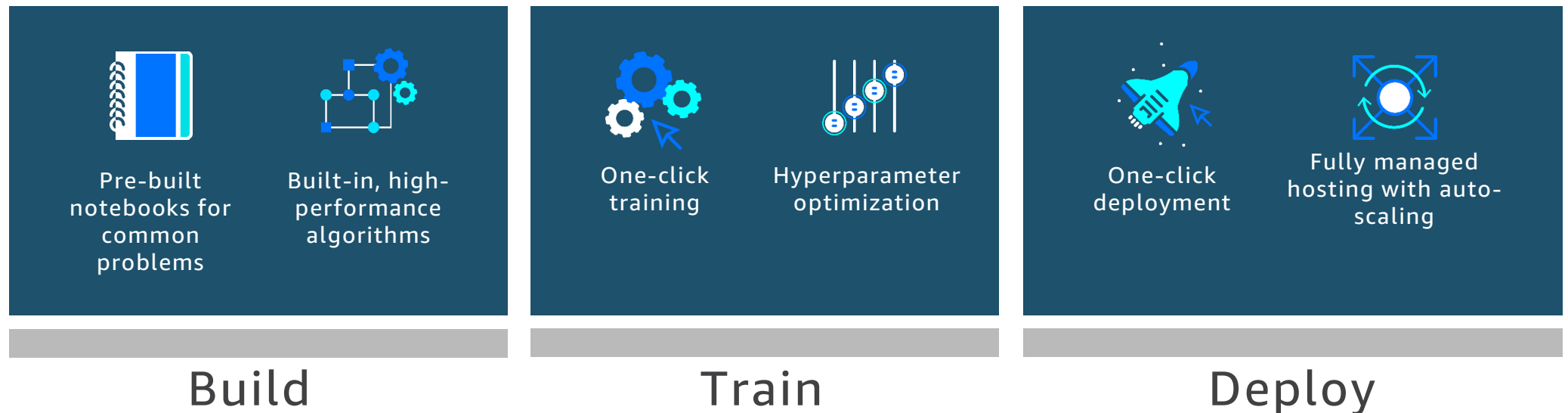
```
mplayer -demuxer lavf -lavfdopts format=mjpeg:probesize=32 /tmp/results.mjpeg
```

3. Training a Model in Amazon SageMaker



What is Amazon SageMaker?

Amazon SageMaker is a fully managed platform that enables developers and data scientists to quickly and easily build, train, and deploy machine learning models at any scale.





4. Extending a Project

Self-Paced Lab Instructions

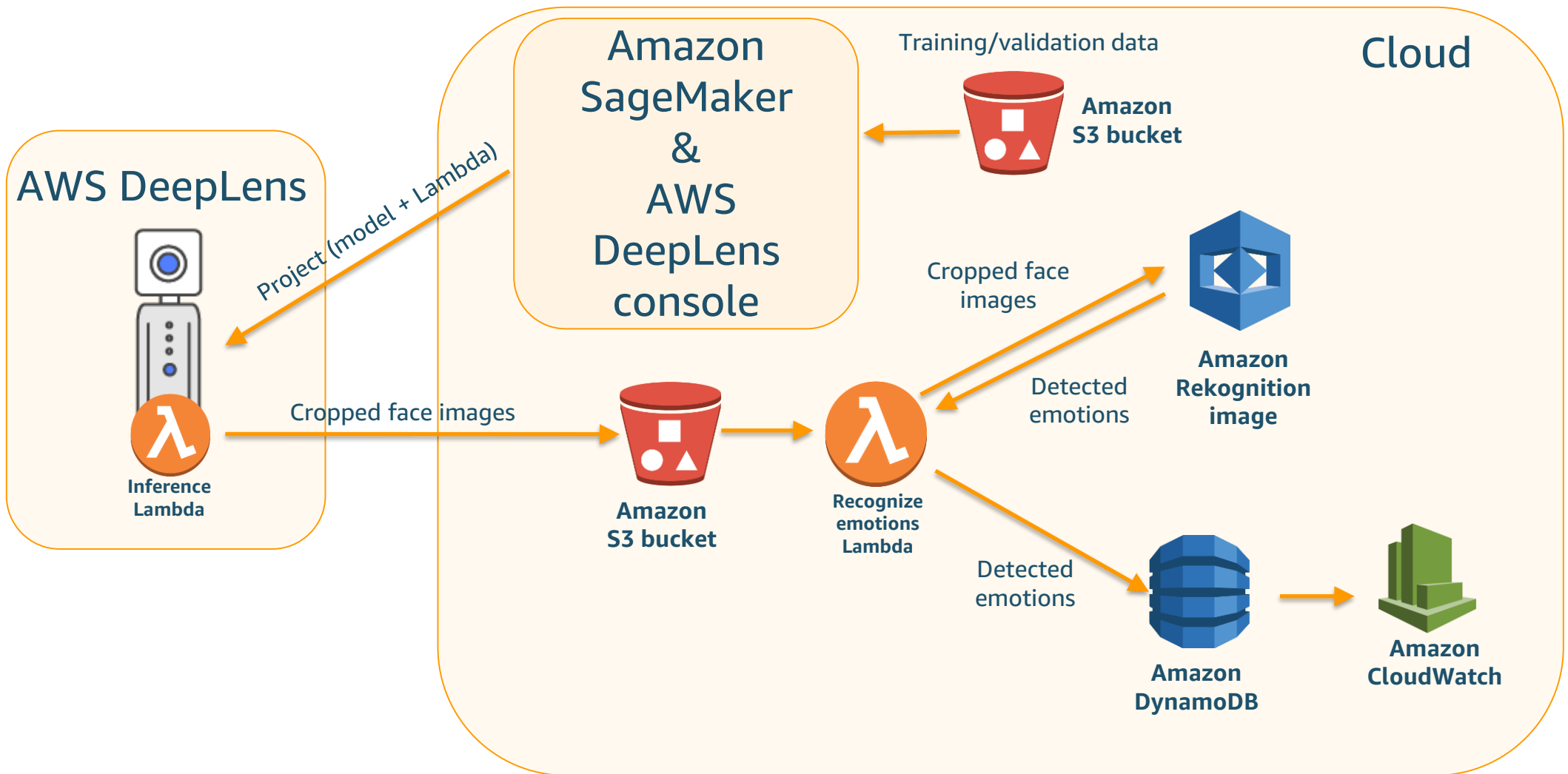
1. Find the instruction manual here:

<https://github.com/mahendrabairagi/DeeplensWorkshop/>

2. Choose: Lab 3

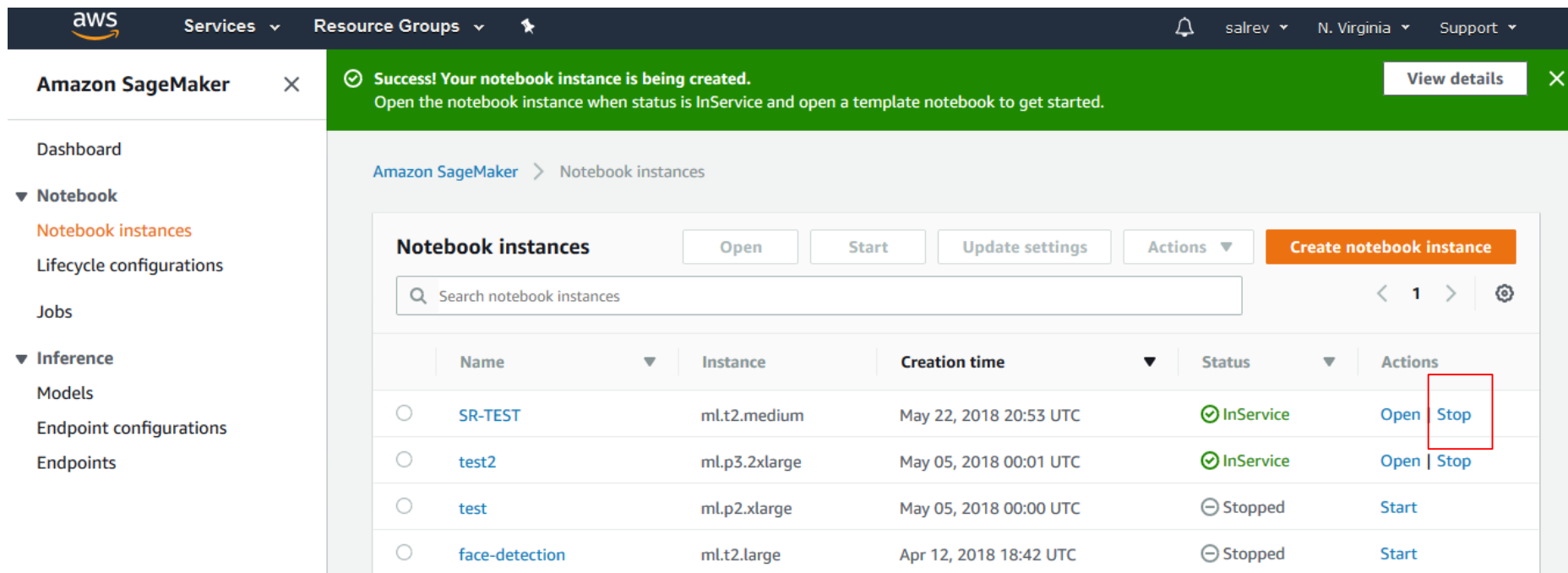


40 minutes



Important Note!

Please ensure you stop the Amazon SageMaker notebook instance to avoid ongoing charges to your AWS account.



The screenshot shows the Amazon SageMaker console interface. At the top, there's a navigation bar with the AWS logo, 'Services', 'Resource Groups', and user information. A green banner at the top right displays a success message: 'Success! Your notebook instance is being created. Open the notebook instance when status is InService and open a template notebook to get started.' Below this, the left sidebar contains navigation links for 'Dashboard', 'Notebook' (with sub-links for 'Notebook instances', 'Lifecycle configurations', and 'Jobs'), and 'Inference' (with sub-links for 'Models', 'Endpoint configurations', and 'Endpoints'). The main content area is titled 'Amazon SageMaker > Notebook instances'. It features a 'Notebook instances' section with buttons for 'Open', 'Start', 'Update settings', 'Actions', and a prominent orange 'Create notebook instance' button. A search bar is also present. Below the search bar is a table listing notebook instances. The table has columns for Name, Instance, Creation time, Status, and Actions. Two instances are in 'InService' status, and two are 'Stopped'. A red box highlights the 'Stop' button in the Actions column for the first 'InService' instance, 'SR-TEST'.

Name	Instance	Creation time	Status	Actions
SR-TEST	ml.t2.medium	May 22, 2018 20:53 UTC	InService	Open Stop
test2	ml.p3.2xlarge	May 05, 2018 00:01 UTC	InService	Open Stop
test	ml.p2.xlarge	May 05, 2018 00:00 UTC	Stopped	Start
face-detection	ml.t2.large	Apr 12, 2018 18:42 UTC	Stopped	Start

Now, it's your turn



Winners of the AWS DeepLens Hackathon



First place



ReadToMe

Created by Alex Schultz

ReadToMe is a deep learning enabled application that is able to read books to kids. In this case, *Green Eggs and Ham*, by Dr. Seuss.

Second place



Dee

Created by Matthew Clark

Dee is a fun AWS DeepLens interactive device for children. The device asks children to answer questions by showing a picture of the answer.

Third place



SafeHaven

Created by Nathan Stone and Peter McLean

SafeHaven uses Alexa and AWS DeepLens to bring peace of mind for vulnerable people and their families.

View all 23 projects at: <https://aws.amazon.com/deeplens/community-projects>



AWS DeepLens Challenge

Are You Ready for a Challenge?

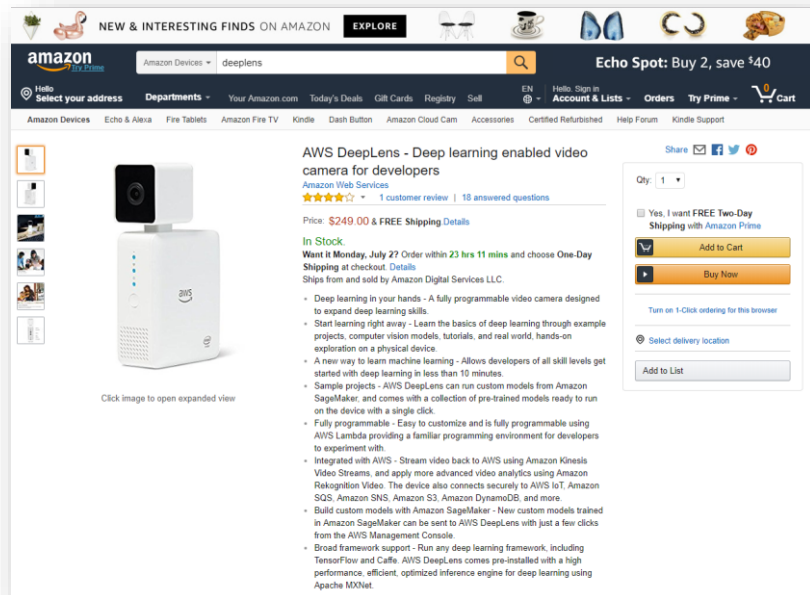
Build machine learning projects using AWS DeepLens, and make a difference!

- **What is it:** Eight themed challenges that will each run for two weeks, you have the opportunity to combine your ideas with the capability of AWS DeepLens to create machine learning projects that can have a positive impact on the world.
- **Why:** These challenges will help you gain valuable machine learning experience within a fun, collaborative, and inspiring environment. You'll be making a positive impact on improving people's lives and supporting non-profits that benefit our society.
- **When:** Challenges started on July 10 and will run through end of 2018.
- **Learn more:** <https://aws.amazon.com/deeplens/challenge/>

Thanks & Wrap-Up

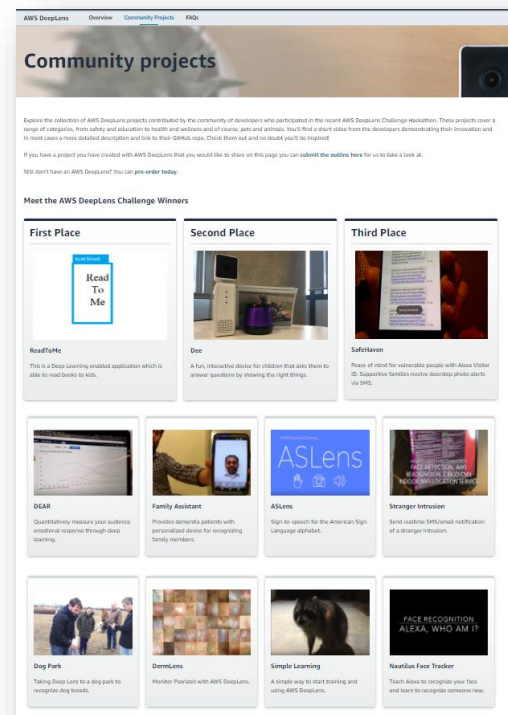
Order on Amazon.com

Search: AWS DeepLens



See what others have built

aws.amazon.com/deeplens/community-projects



Request a workshop

Work with your AWS account management team to request a hands-on Amazon SageMaker & AWS DeepLens workshop



Questions?





Thank you!

여러분의 피드백을 기다립니다!



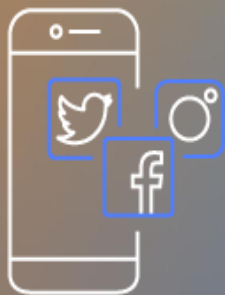
강연 평가 및 설문 조사

QR 코드를 통해 AWS DEV DAY SEOUL에 대한 여러분의 의견을 공유해주세요.
강연 평가 및 설문 조사에 참여해 주신 분께는 등록데스크에서 특별한 기념품을 드립니다.



강연 영상

AWS DEV DAY SEOUL 강연 영상은 행사 종료 후 메일로 공유드릴 예정입니다.



#AWSDEVDAYSEOUL

소셜미디어에 행사 참여 소감을 공유해주세요!

