

## DEEPPAKES ARE GETTING PROGRESSIVELY MORE DIFFICULT TO CRACK

- Deepfake are media generated through artificial intelligence in order to fool a viewer. Deepfake detection also uses artificial intelligence to try to prove if a deepfake is real or not. However, this means that the AI used to form the deepfakes can use the AI made to detect the deepfakes in order to create even better deepfakes that cannot be detected.
- Our group took inspiration from a Kaggle Deepfake Detection Challenge that was hosted by AWS, Facebook, and Microsoft in order to improve on deepfake detection. We wanted to know how the advanced AI used by these solutions would do in Intel DevCloud.

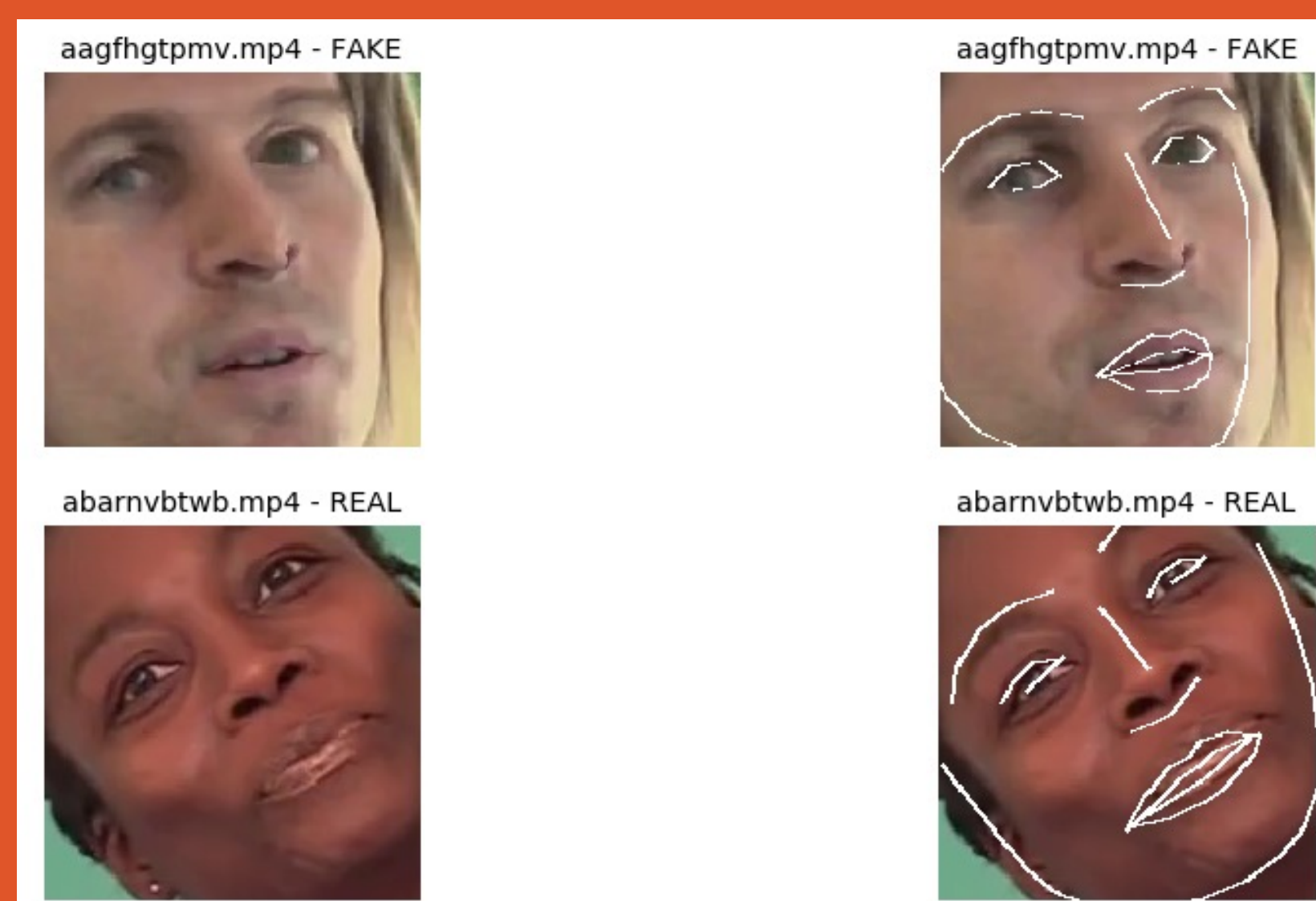


Figure 1: This image from a jupyter notebook showcases part of how the AI detects and recognizes deepfakes

Where you able to tell the first image was fake?

# DEEPPAKE DETECTION IN INTEL-DEV CLOUD

## Is it Real, Or is it Fake?

### ADAPTING TO INTEL DEV CLOUD

The most important areas of our work included adapting the deepfake AI to Intel DevCloud.

While there was seemingly a lack of thorough documentation regarding the tools of Intel DevCloud aside from sample data and models, jupyterlabs and jupyter notebooks were powerful tools that made the process easy to step into.

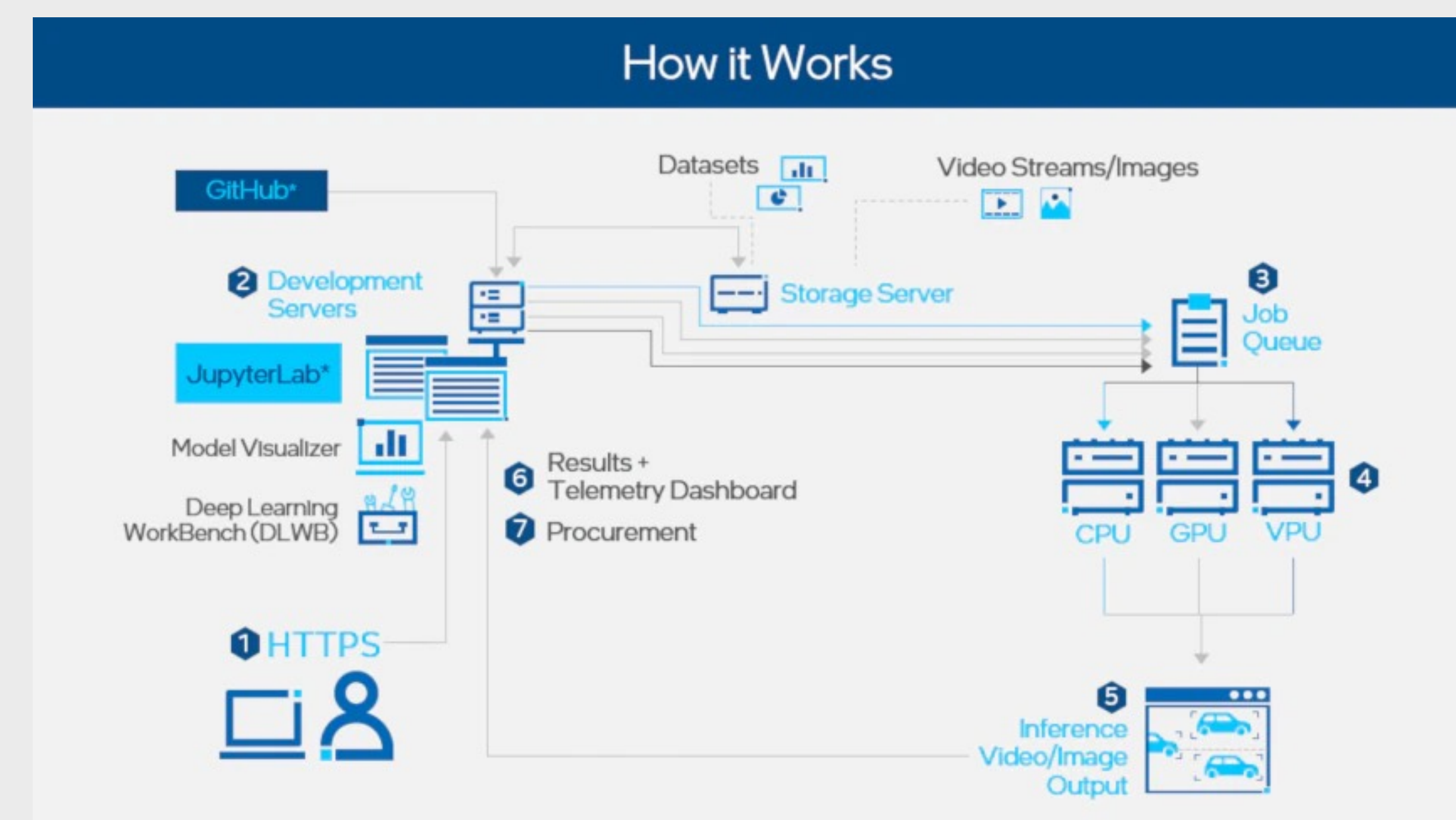


Figure 2: Intel DevCloud Overview

As figure 2 entails, Intel DevCloud has a lot of tools that make it a powerful tool to use with AI and deepfake detection. We were able to connect to github to easily import and store all the training data and necessary modules as well as use jupyterlabs to run our inference models. Finally, use of the job queue could be used to speed up training though GPUs.

### CONNECTING TO INTEL DEV CLOUD

In order to setup a front end site that could connect remotely to Intel DevCloud, we had to store our inference results in csv files in real time and transfer them onto our local machine.

In the image to the right is an example of our inference results.

	filename	label	inference	time
1	metahuman.mp4	0.597	Efficientnet Single Mo...	1.482
2	metahuman.mp4	0.212	ResNeXt50 Classifier	1.645

Figure 3: Results from Intel DevCloud

### THE REQUIREMENTS

We have created an interface to cloud service with Intel DevCloud to do inference in real-time.

We used the Intel DevCloud for working with both the AI training model and inference model for our deepfake detection and also are deploying the inference in real time using the Intel DevCloud.

### WHY USE DEV CLOUD?

DevCloud is a powerful sandbox tool for machine learning and artificial intelligence due to the tools it provides to optimize models and run tests on CPUs, GPUs, and VPUs.

Learn more at: <https://www.intel.com/content/www/us/en/dev-elooper/tools/devcloud/edge/learn/overview.html>

Or simply by searching for: Intel DevCloud

### ABOUT OUR TEAM

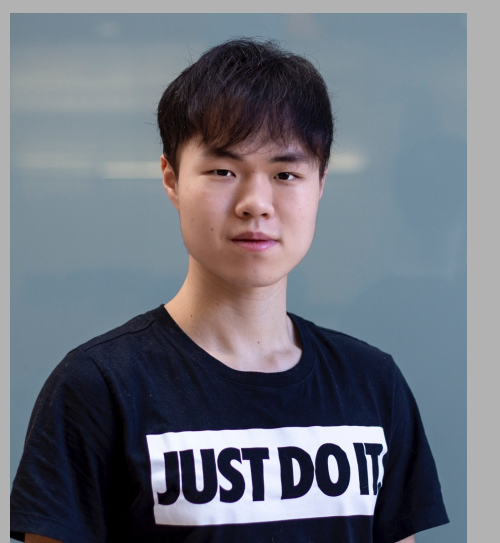
We are a team of five passionate CS students interested in artificial intelligence

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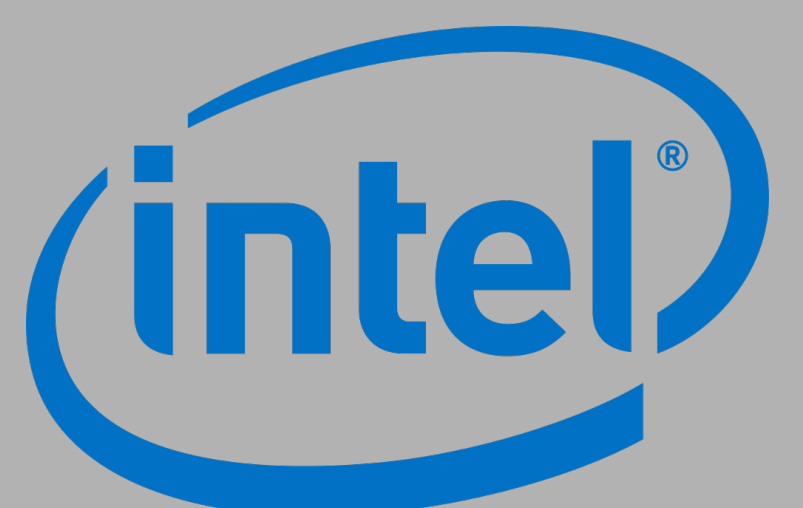
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### OUR MISSION

In our project, we want to show off the performance of Intel DevCloud as a tool to work with Artificial Intelligence. In doing so, we are exploring deepfake AI in Intel DevCloud and providing documentation regarding how one can use the Intel DevCloud with AI for future users and students.

We made this our mission because Intel DevCloud is a free service, which provides a lot of tools, software and hardware for AI data analysis, inference and model training. Students and researchers should be aware of this powerful solution.

Another mission of our project is simply spreading awareness about the danger of deepfake videos which can be detected in our project, in our media centric society.

