

# Deepfake Detector

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## Team Faux Fighters

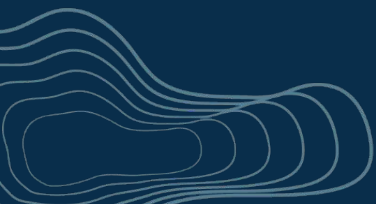
Cho, Anna

Denq, Christopher

Nelson, Reid (Jackson)

# Roadmap

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# Roadmap

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## Problem Statement



# Roadmap

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**Problem  
Statement**



**Methodology**



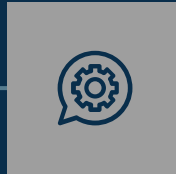
# Roadmap

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**Problem  
Statement**



**Methodology**



**Analysis**



# Roadmap

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**Problem  
Statement**



**Methodology**



**Analysis**



**Conclusion**



A decorative background on the right side of the slide featuring a topographic map with concentric contour lines in a light gray color.

**01**

# **Problem Statement**

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“AI is spook.”

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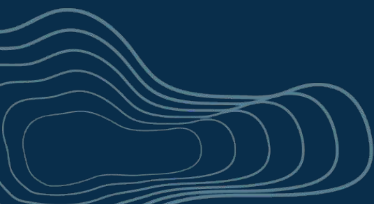
**—Elon Musk, probably**



# PROBLEM

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Generative AI makes it easy to deepfake.



# PROBLEM

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Generative AI makes it easy to deepfake.

Deepfake



Real



## **PROBLEM**

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Generative AI makes it easy to deepfake.

## **SOLUTION**

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We have “out-of-box” deepfake detector.

A decorative topographic map pattern with concentric contour lines in a light gray color, located on the left side of the slide.

**02**

# **METHODOLOGY**

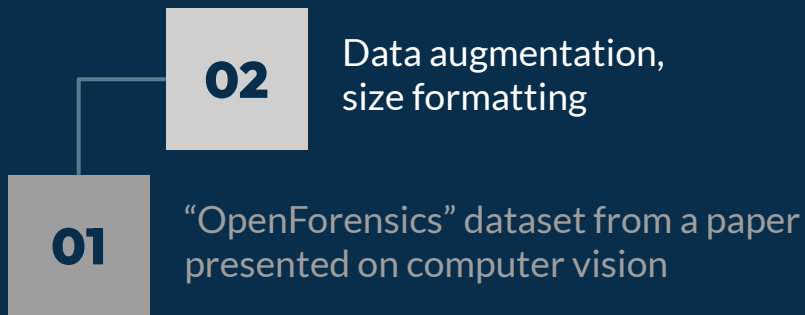
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**01**

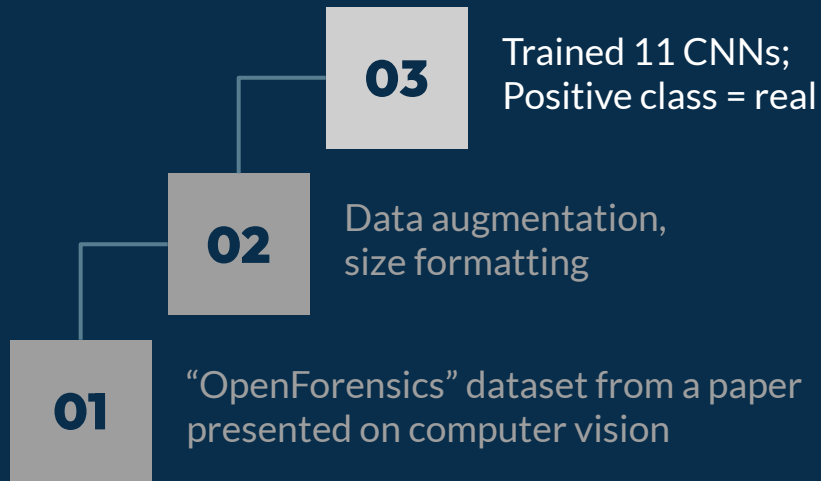
“OpenForensics” dataset from a paper  
presented on computer vision

**SOURCE**



**CLEAN**

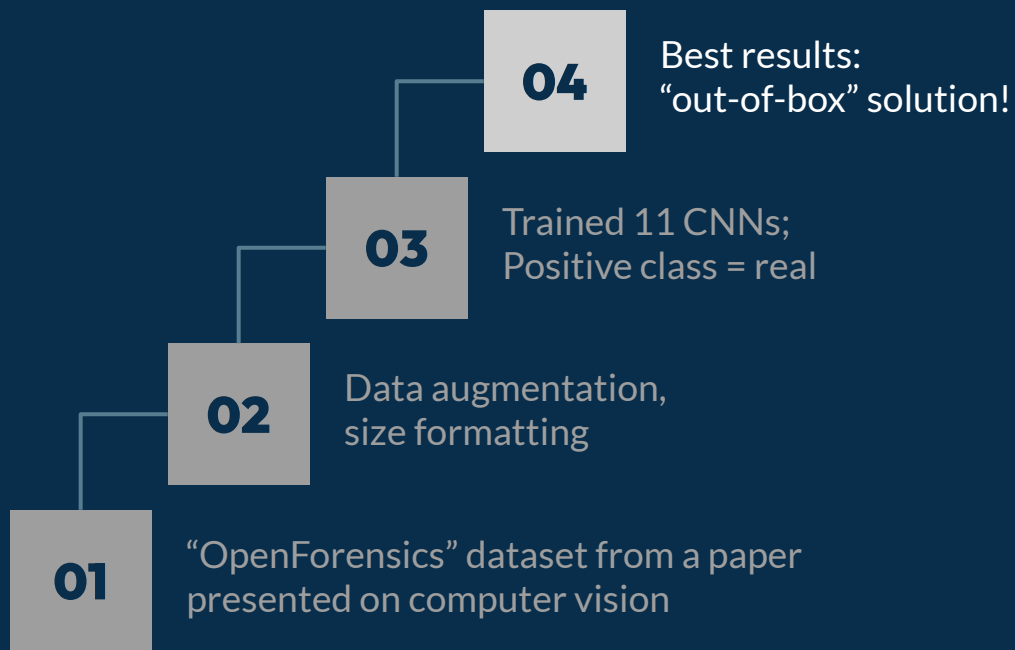
**SOURCE**



**MODEL**

**CLEAN**

**SOURCE**



**RESULT**

**MODEL**

**CLEAN**

**SOURCE**



A decorative background on the right side of the slide featuring a topographic map with concentric contour lines in a light gray color.

**03**

# **ANALYSIS**

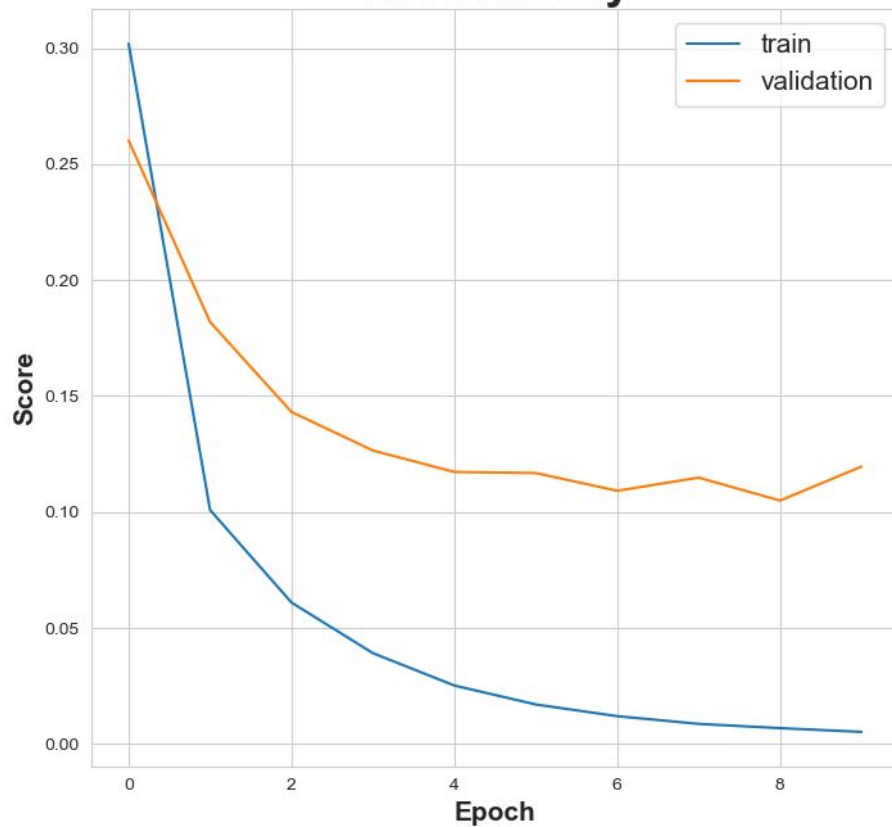
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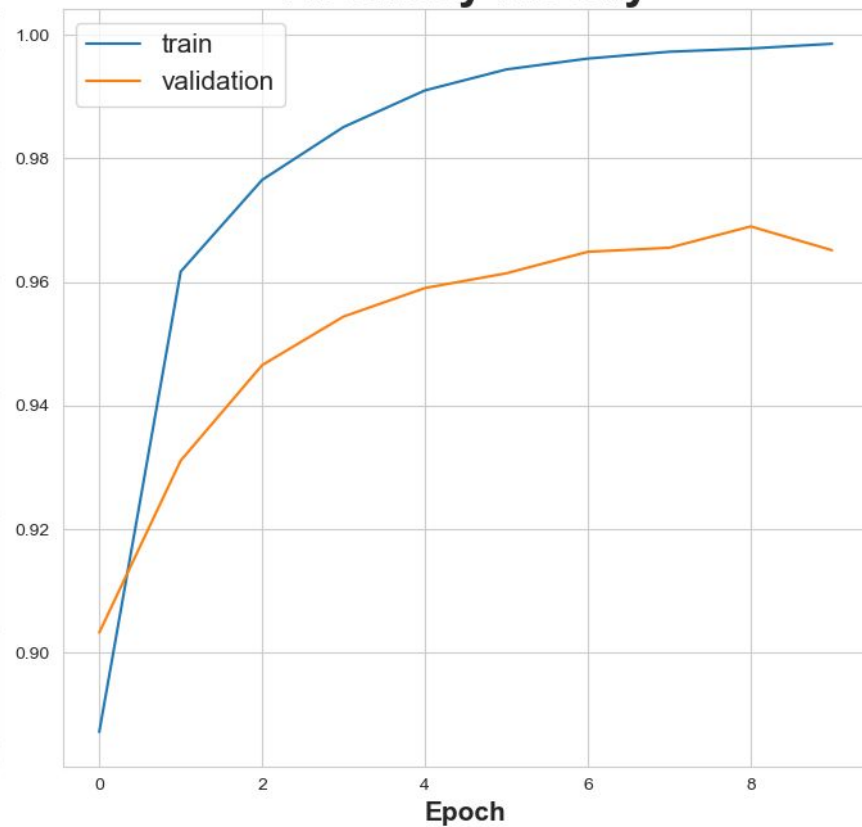
**Best Model**

**Eff.NetV2\_B0**

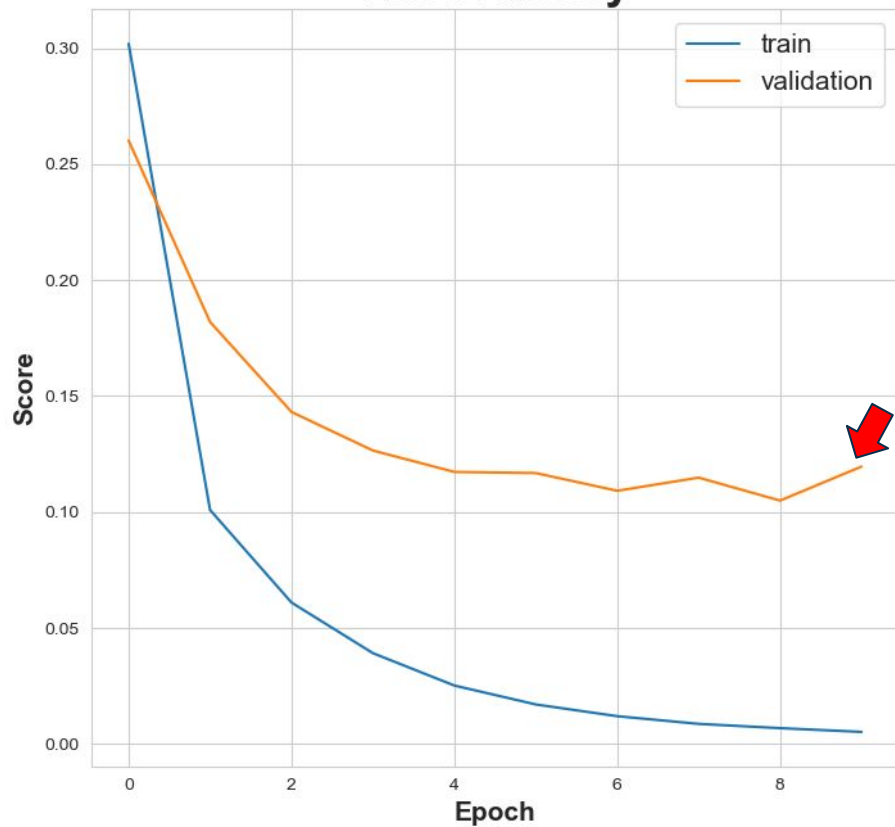
## Loss History



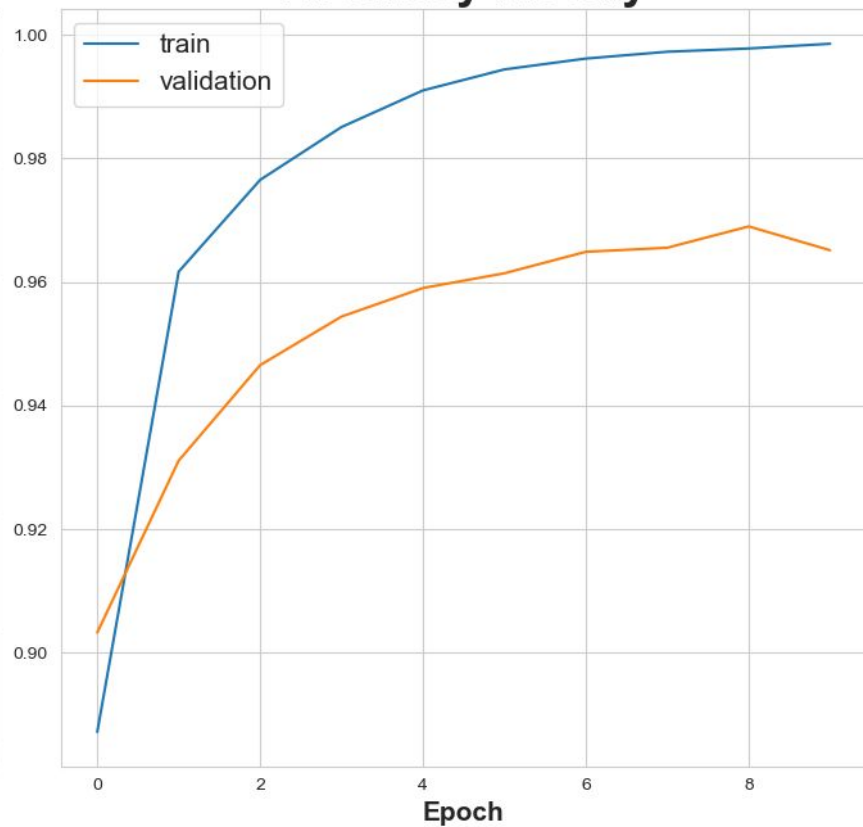
## Accuracy History



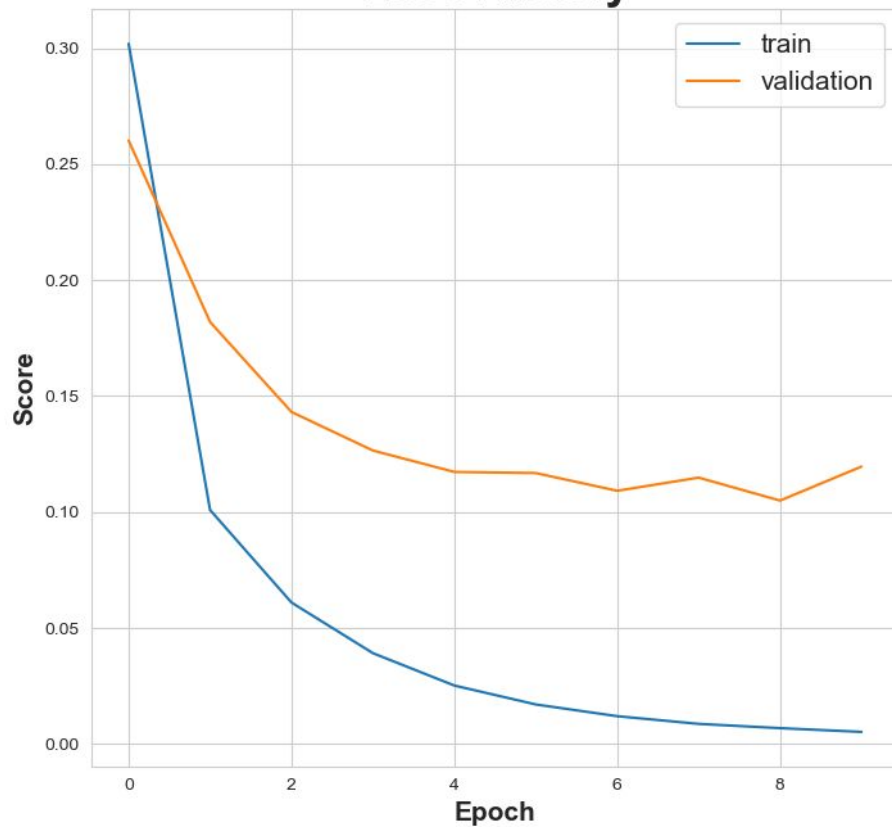
## Loss History



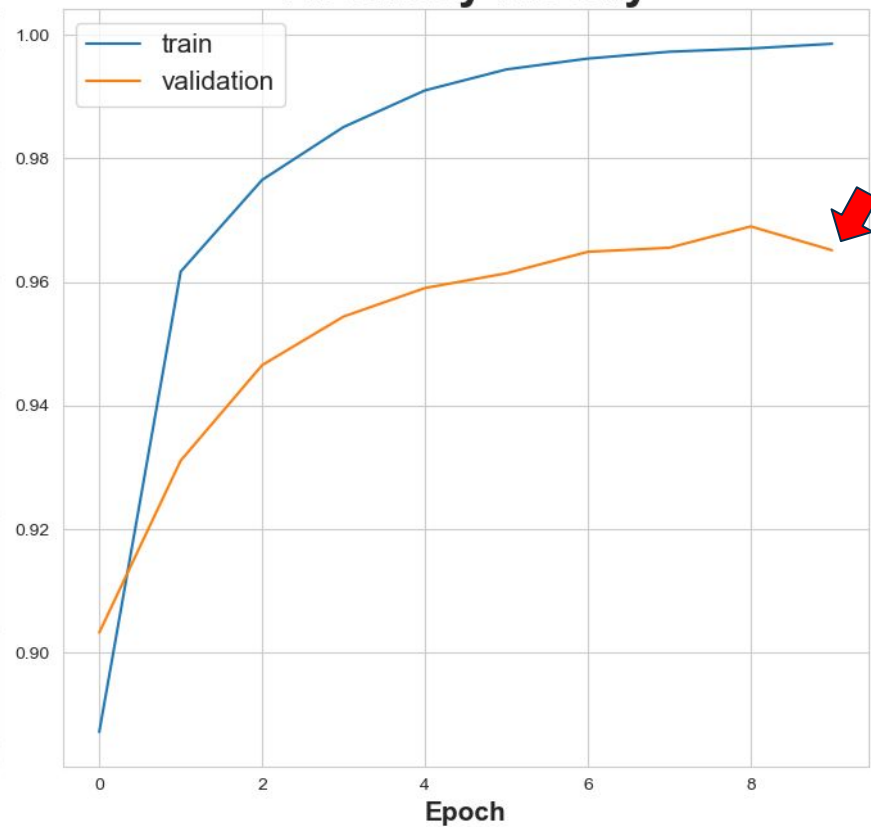
## Accuracy History



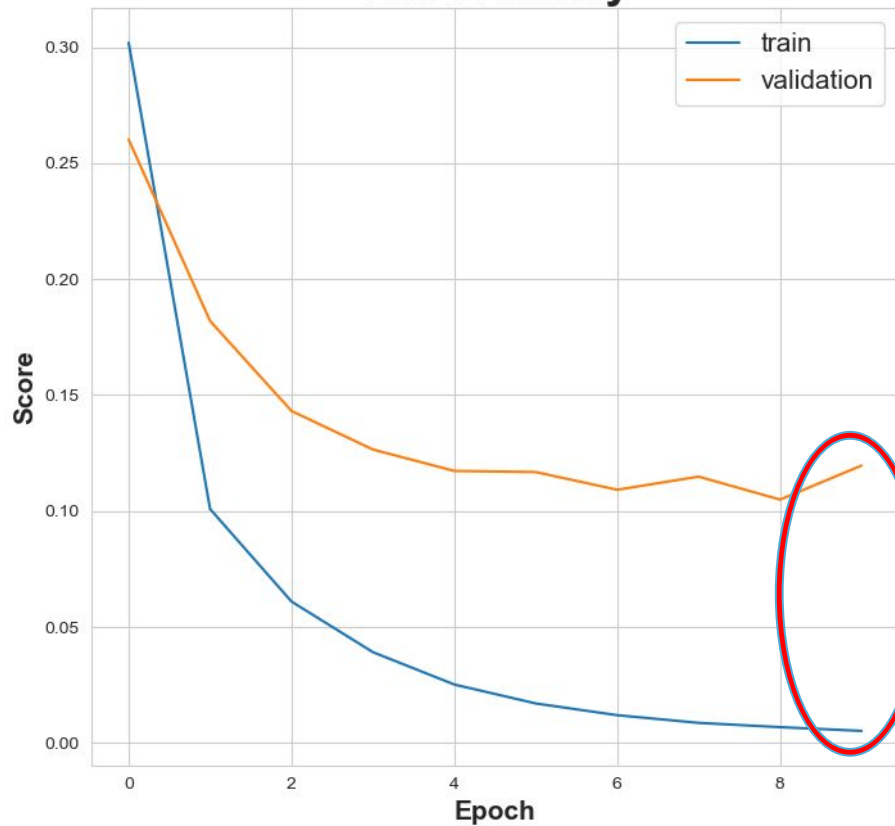
## Loss History



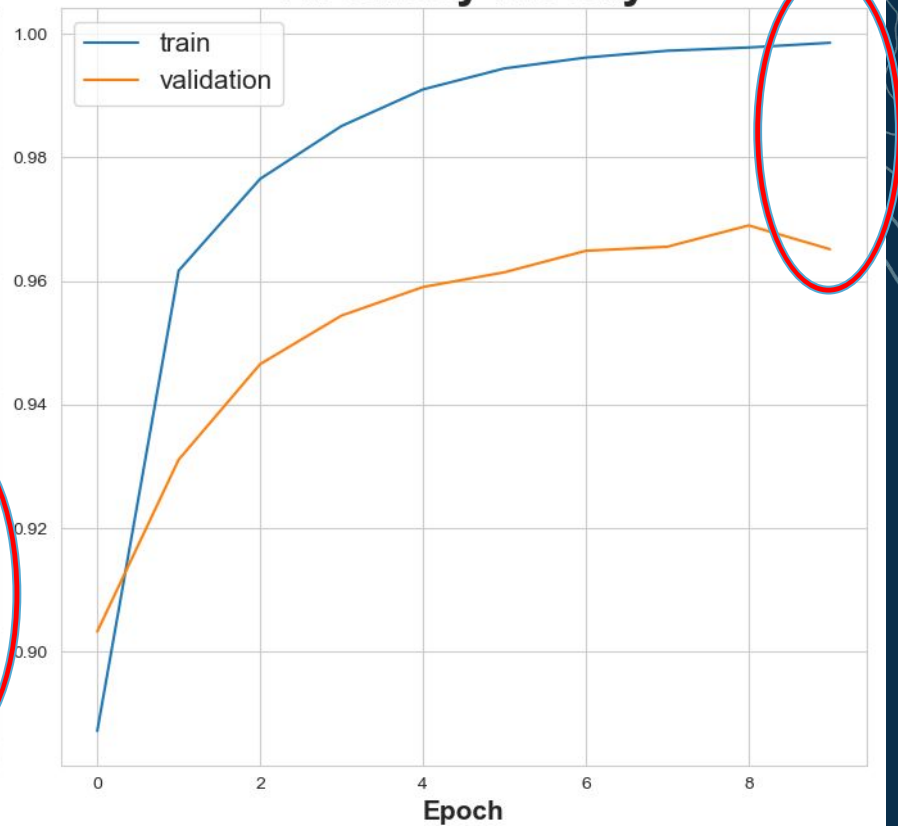
## Accuracy History



## Loss History

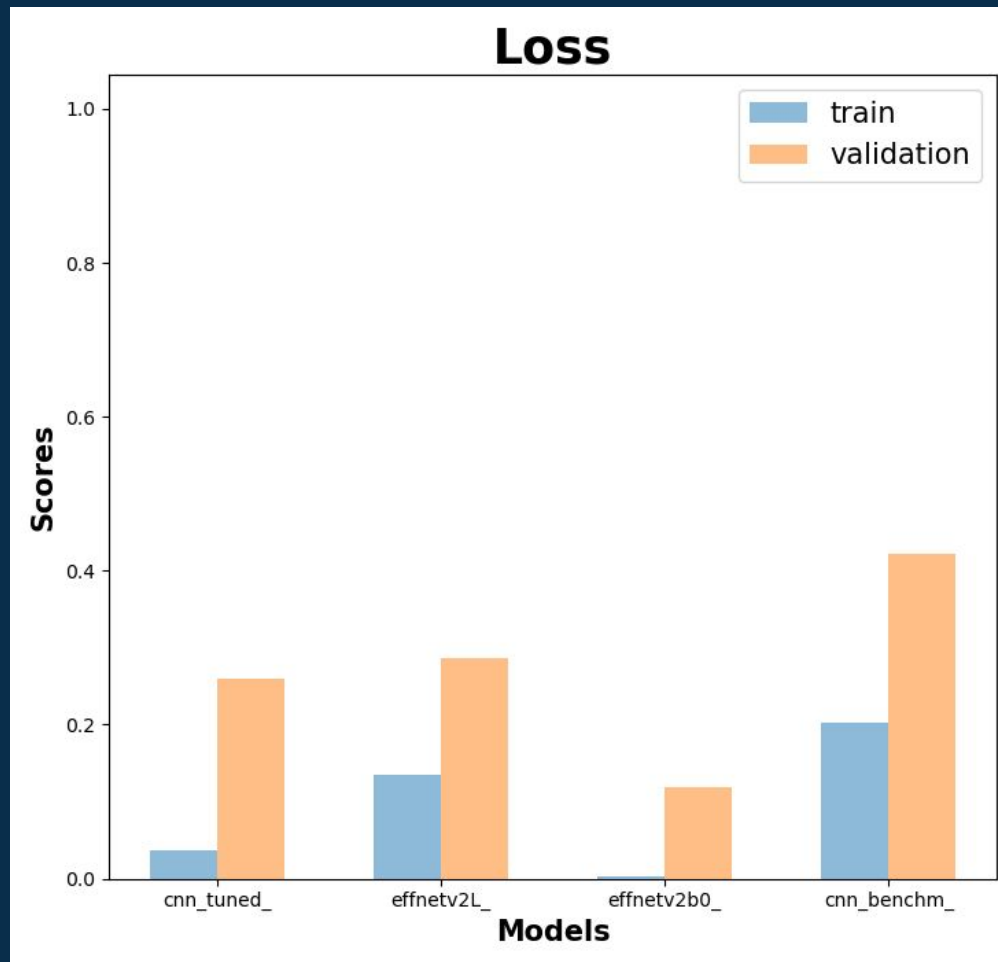


## Accuracy History

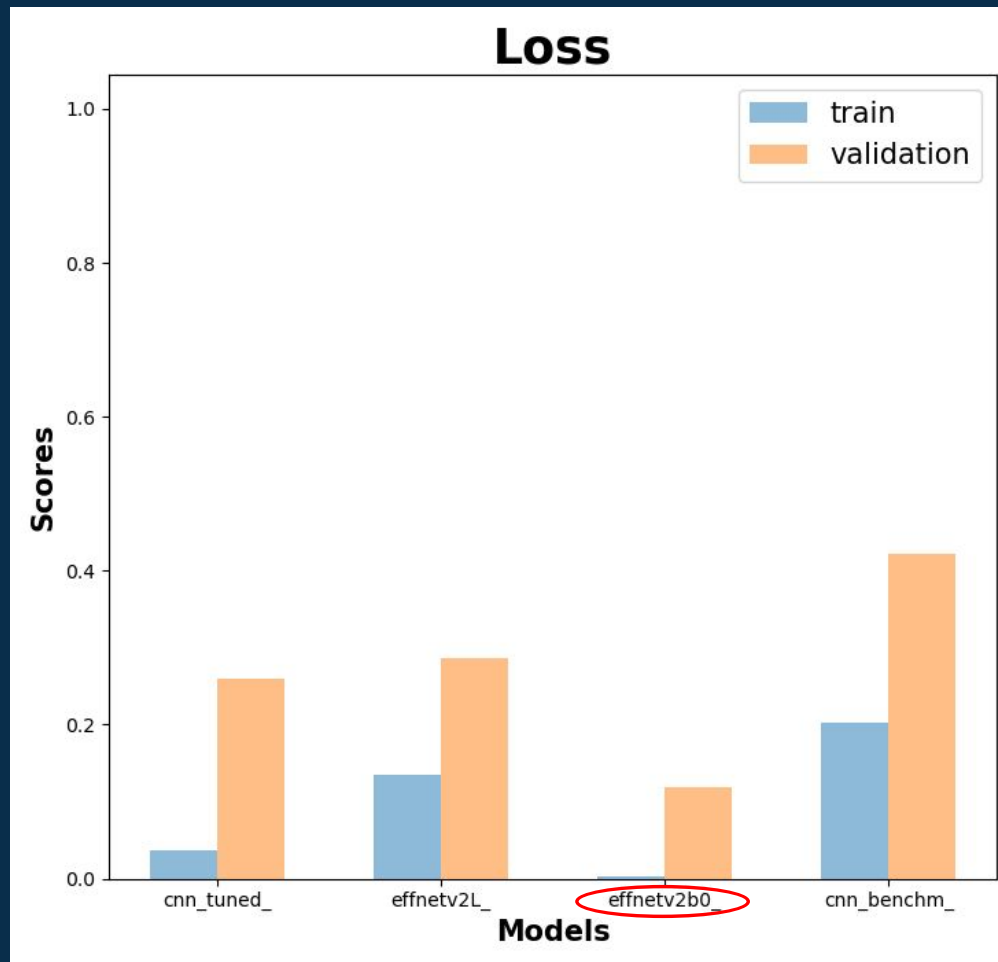


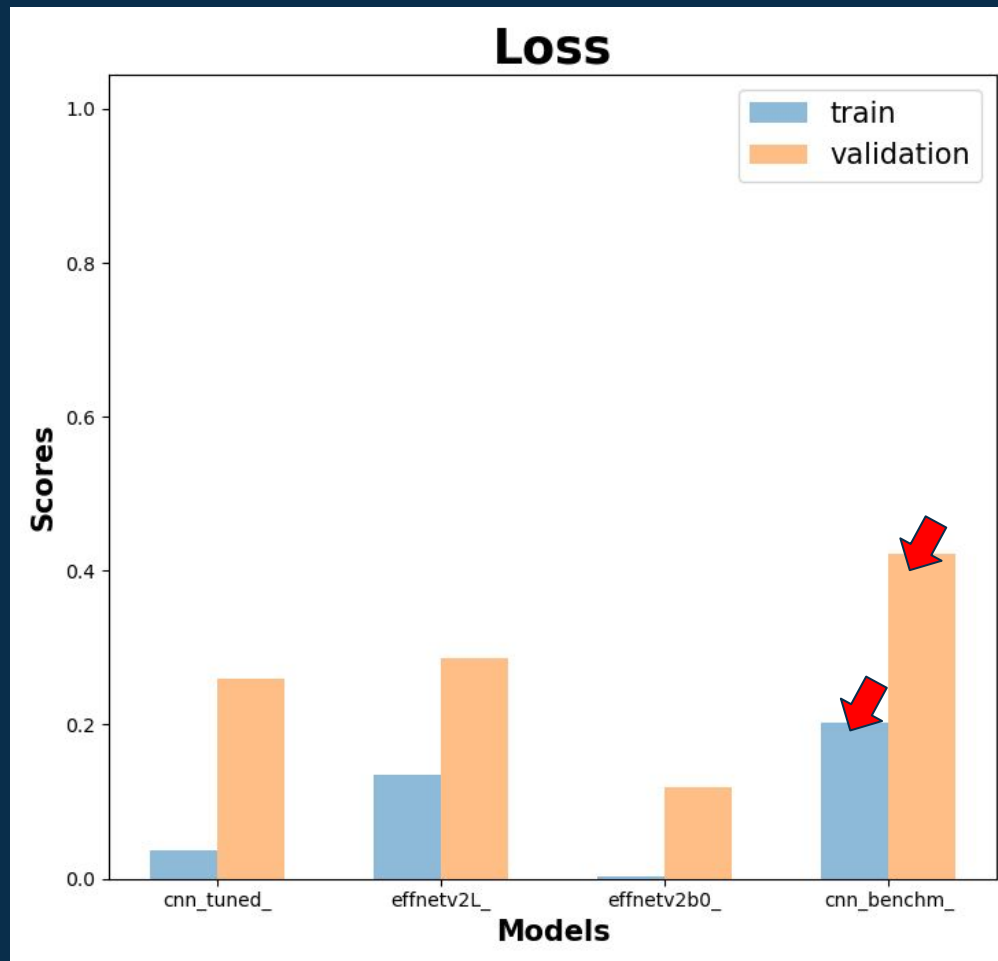


## **Selected Model Comparisons**

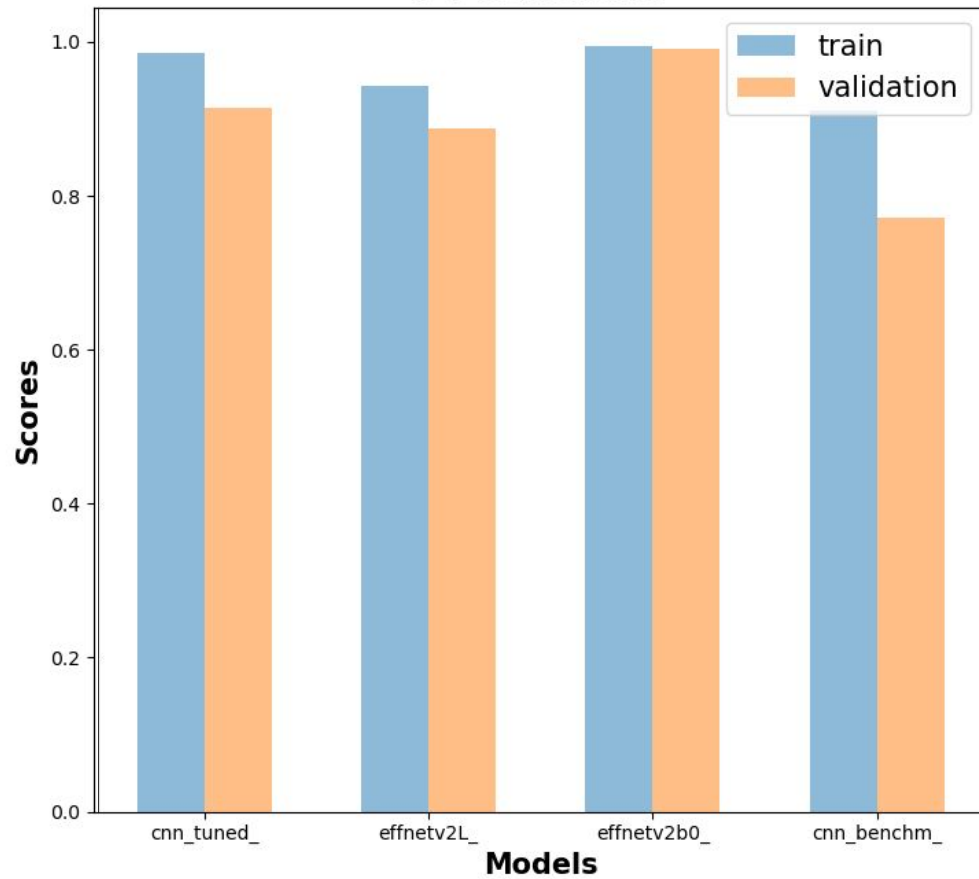


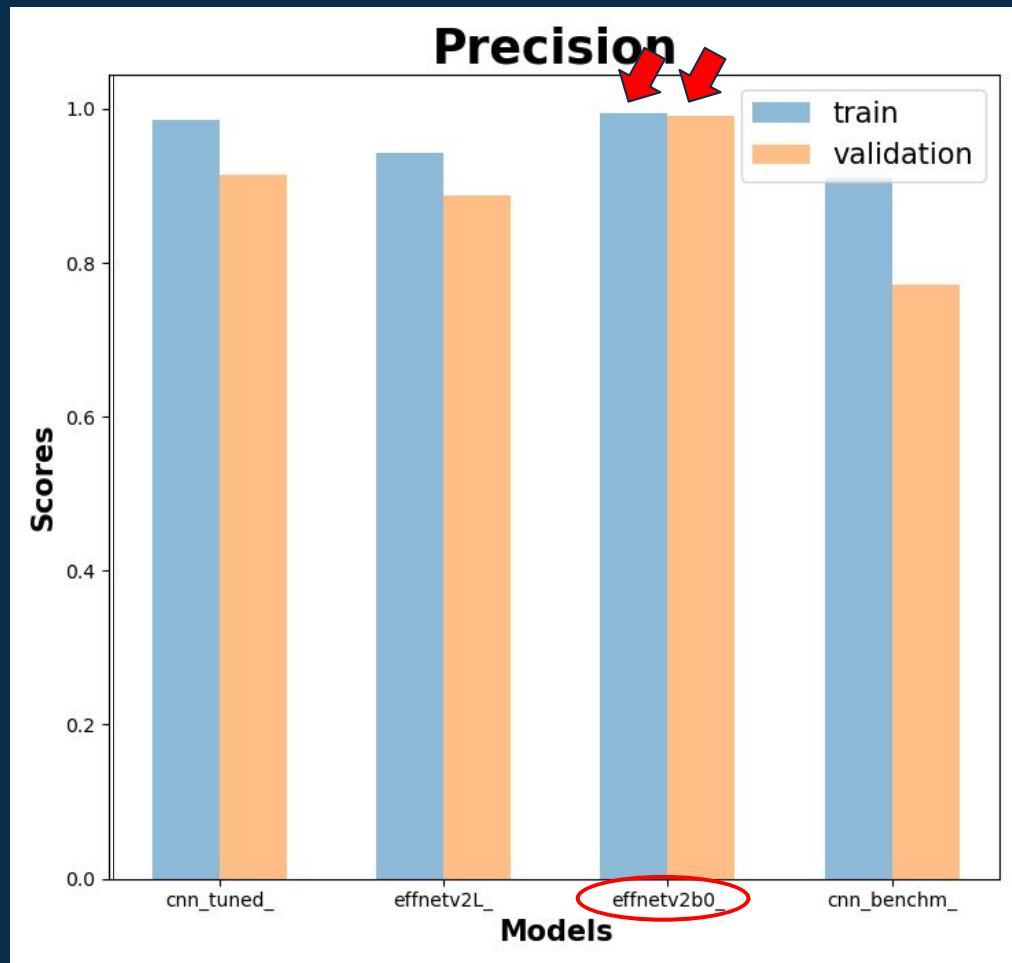






## Precision



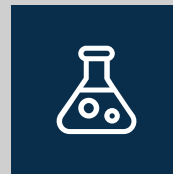




**Best**



**Benchmark**



**Experimental**



# Best



## Benchmark

Sequential CNN (Base)  
Prec: 0.849



## Experimental



# Best



## Benchmark

Sequential CNN (Base)  
Prec: 0.849



## Experimental

EfficientNetv2\_L (TL)  
Prec: 0.822



# Best

EfficientNetv2\_B0  
Prec: 0.992



## Benchmark

Sequential CNN (Base)  
Prec: 0.849



## Experimental

EfficientNetv2\_L (TL)  
Prec: 0.822



A decorative topographic map pattern with concentric, wavy lines in a light gray color, located on the left side of the slide.

**04**

# **CONCLUSION**

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# TAKEAWAYS

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## BEST MODEL

EfficientNetv2\_B0

Precision: 0.992

# TAKEAWAYS

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## BEST MODEL

EfficientNetv2\_B0

Precision: 0.992

## UNCERTAINTIES

- Generalize to other types of deepfake image generators?
- Susceptible to image manipulations (eg. blur)?

# TAKEAWAYS

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## BEST MODEL

EfficientNetv2\_B0

Precision: 0.992

## UNCERTAINTIES

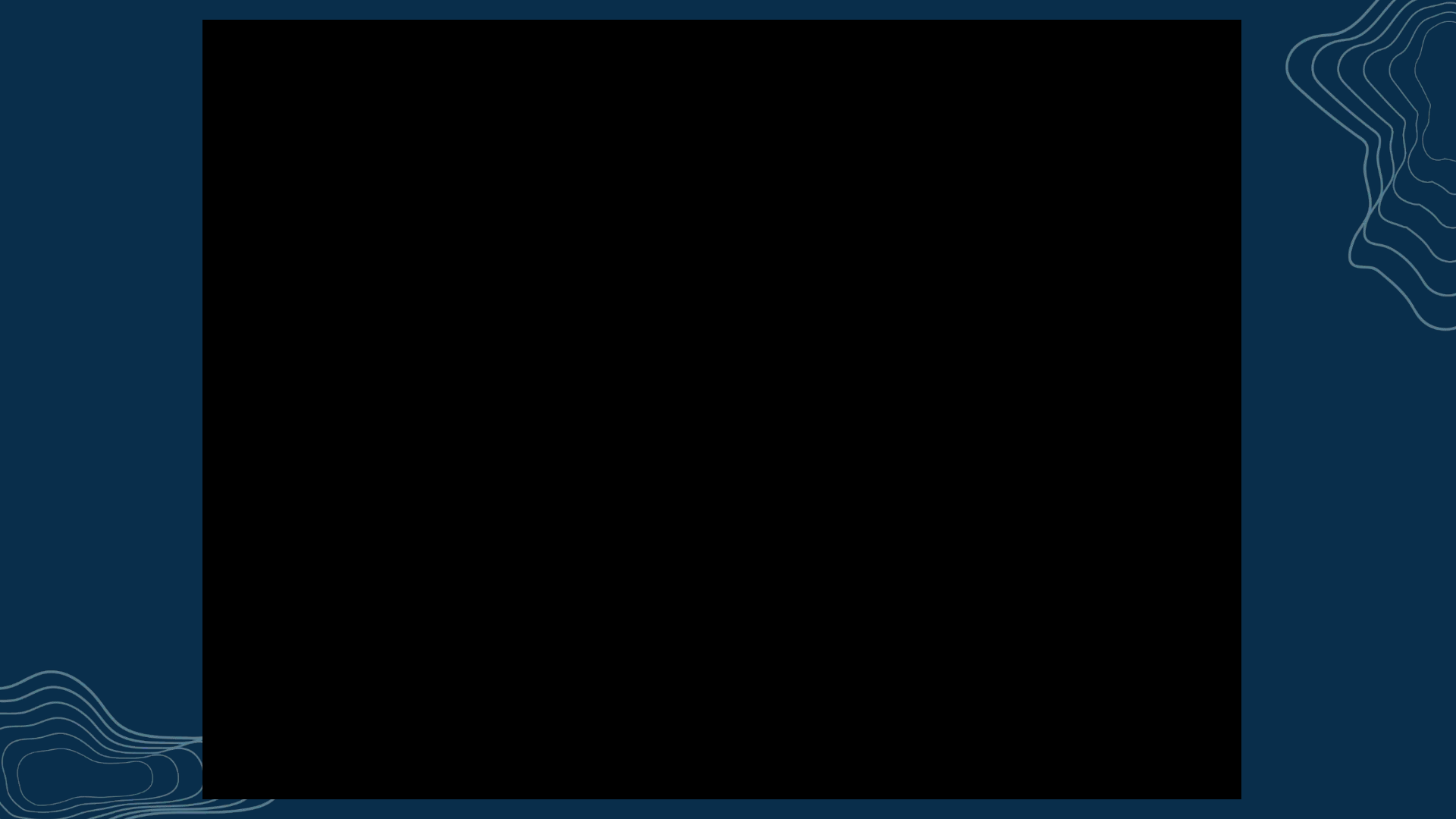
- Generalize to other types of deepfake image generators?
- Susceptible to image manipulations (eg. blur)?

## FUTURE

- Retrain larger EfficientNetv2 Model (eg. more compute resources)
- Address overfitting: (eg. data augmentation)

# DEMO TIME

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The background is a solid dark blue. In the top right and bottom right corners, there are intricate, white, wavy line patterns that resemble topographical map contour lines or stylized smoke. These lines are thin and flow in a generally downward and rightward direction.

# THANK YOU!

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Questions?