

A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue gradient background, resembling a circuit board or neural network structure.

# BEST PRACTICES FOR BUILDING COMPUTER VISION MODELS

LUIS BERMUDEZ

RESEARCH SCIENTIST

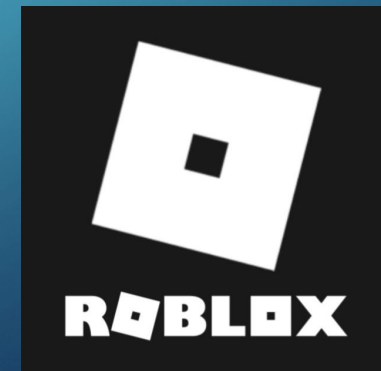
# ABOUT US

- One of the first startups in Silicon Valley
- Serving Netflix, Two Sigma, and Stanford
- Intel Capital has funds and incubates startups
- Nearly every major film has been touched by Intel
- Presented at NeurIPS, CVPR, SIGGRAPH, WACV, and more



# WHAT WE DO

- Optimize TensorFlow
- Build AI Frameworks
- Customer Solutions



The background is a blue gradient. In the corners, there are white line-art illustrations of circuit boards or neural network connections. These lines are of varying thickness and connect to small circles, creating a technical, futuristic feel.

# JOURNEY TO MACHINE LEARNING

# SEMANTIC SEGMENTATION USE CASES

- Handwriting Recognition
- Visual Image Search
- Virtual Makeup





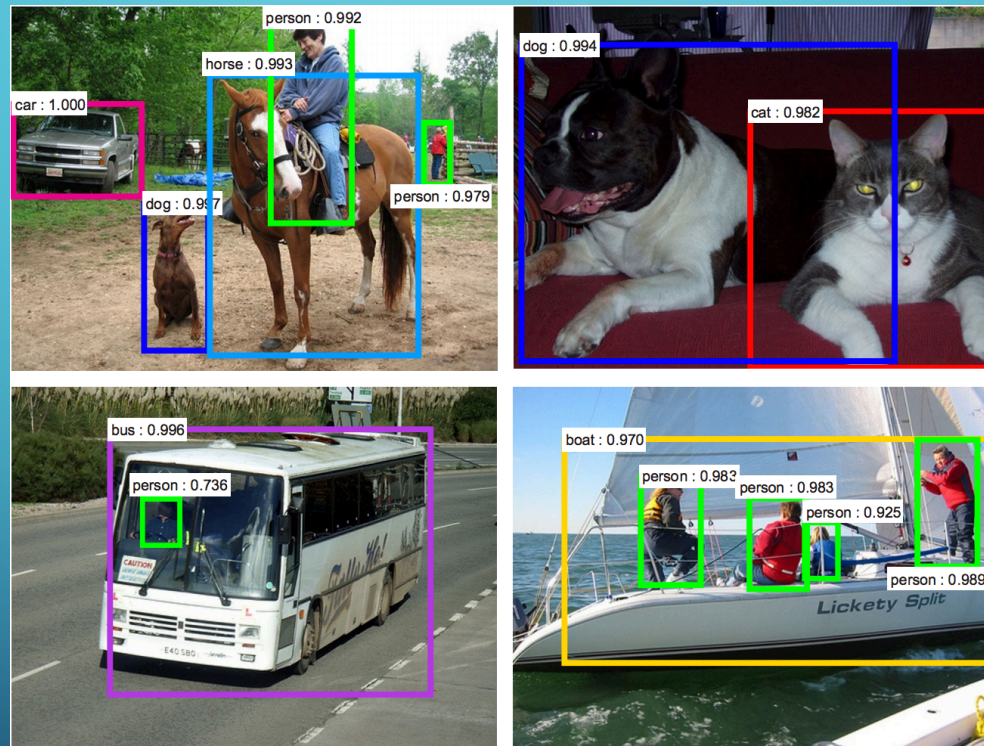
# SEMANTIC SEGMENTATION USE CASES

- Portrait Mode
- Virtual Try On
- Self Driving Cars





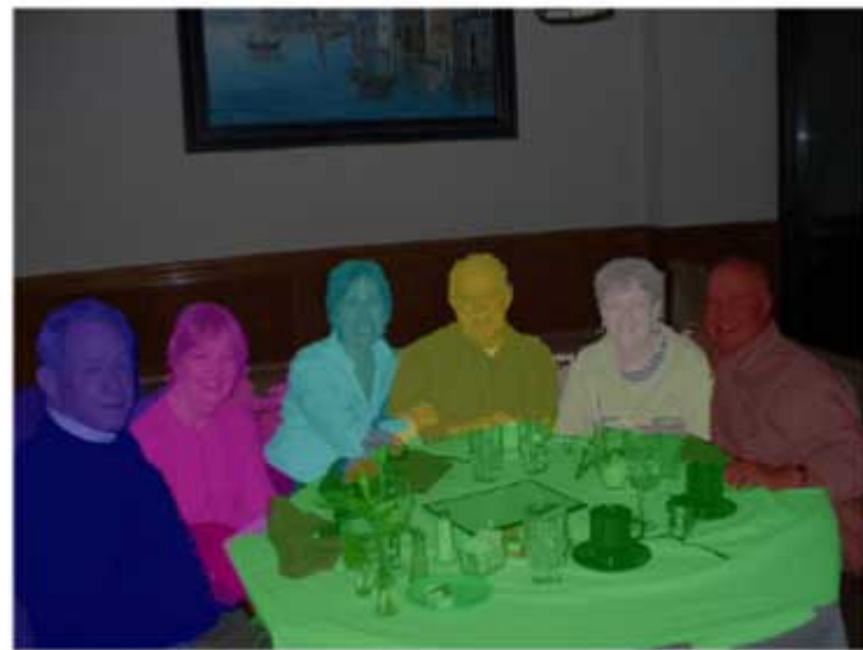
# OBJECT RECOGNITION



# SEMANTIC SEGMENTATION



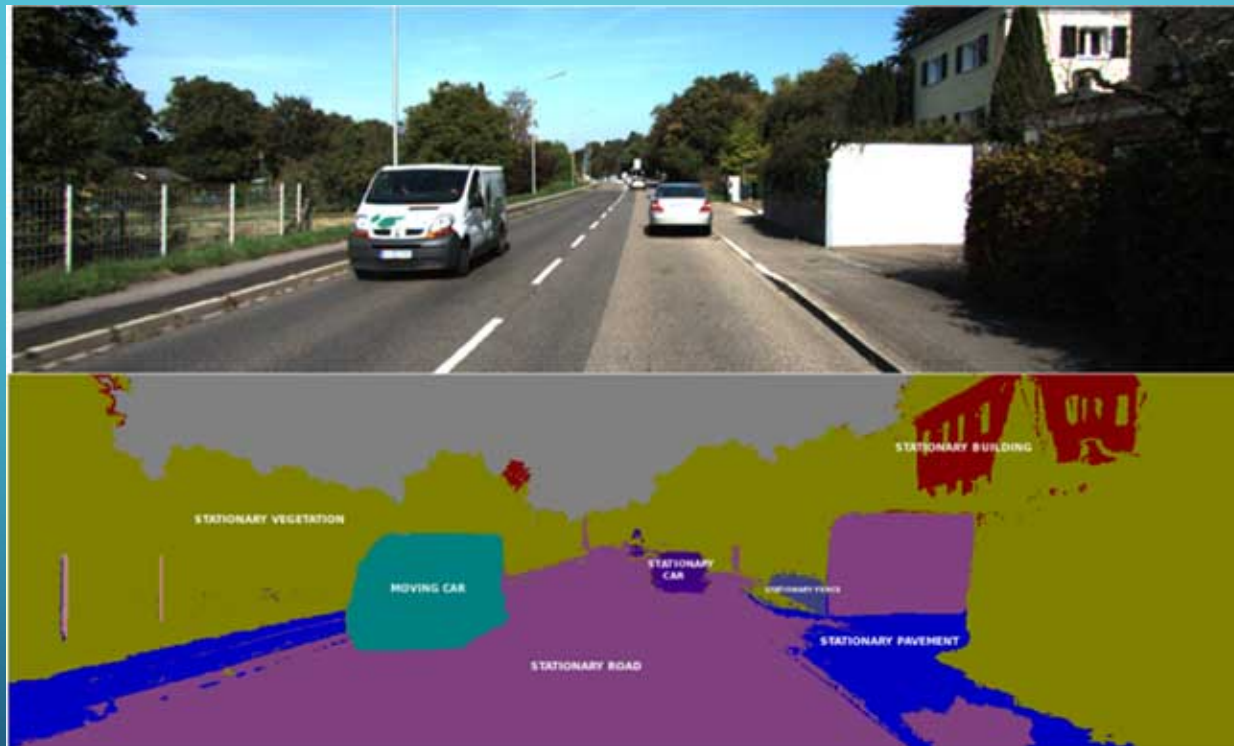
Semantic Segmentation



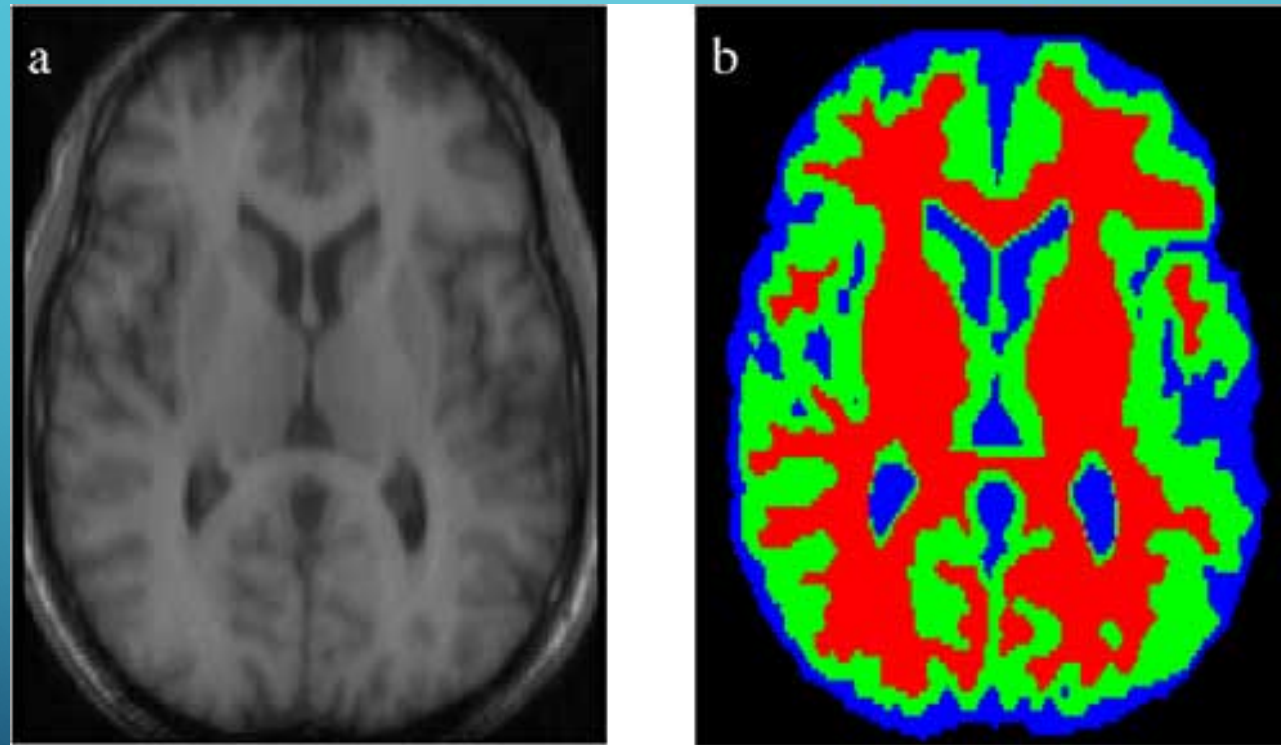
Instance Segmentation



# SEMANTIC SEGMENTATION



# SEMANTIC SEGMENTATION





# TRAINING DATA

- Amazon Turk
- Third Party Labelling
- Professional Labelling

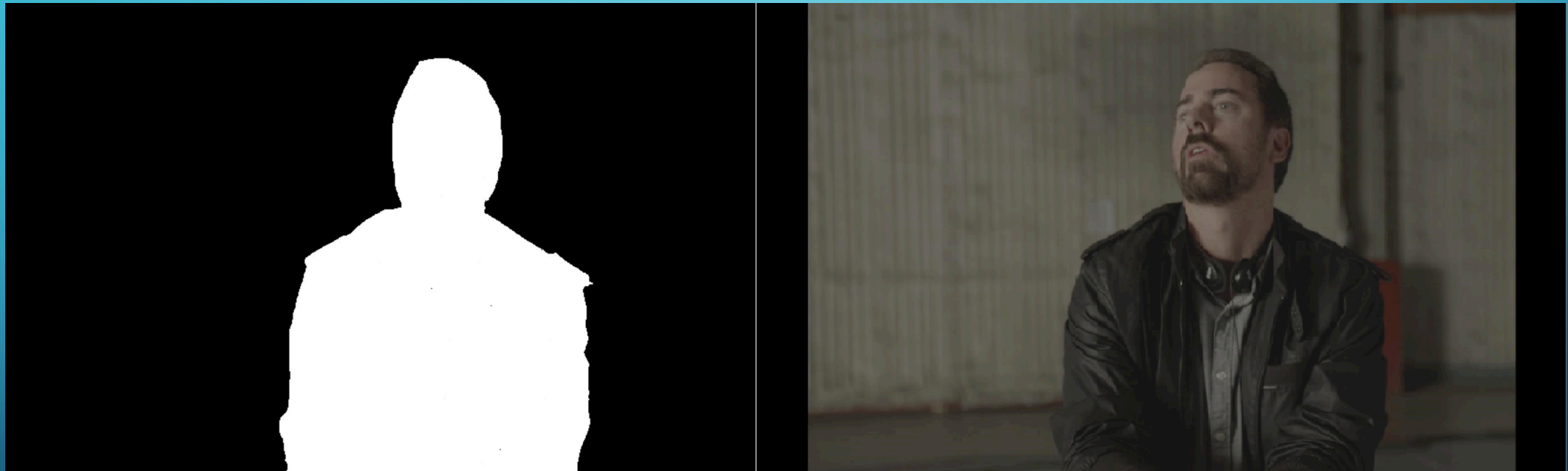
# HISTORY OF WORK (1979-1999)

- Image Segmentation by Clustering
- Histogram-Based Approaches
- Compression
- Region-Growing

# HISTORY OF WORK (2000-2020)

- Convolutional Neural Networks
- R-CNN
- Fast R-CNN
- Fully Convolutional Networks
- Mask R-CNN

# INTERACTIVE VIDEO SEGMENTATION



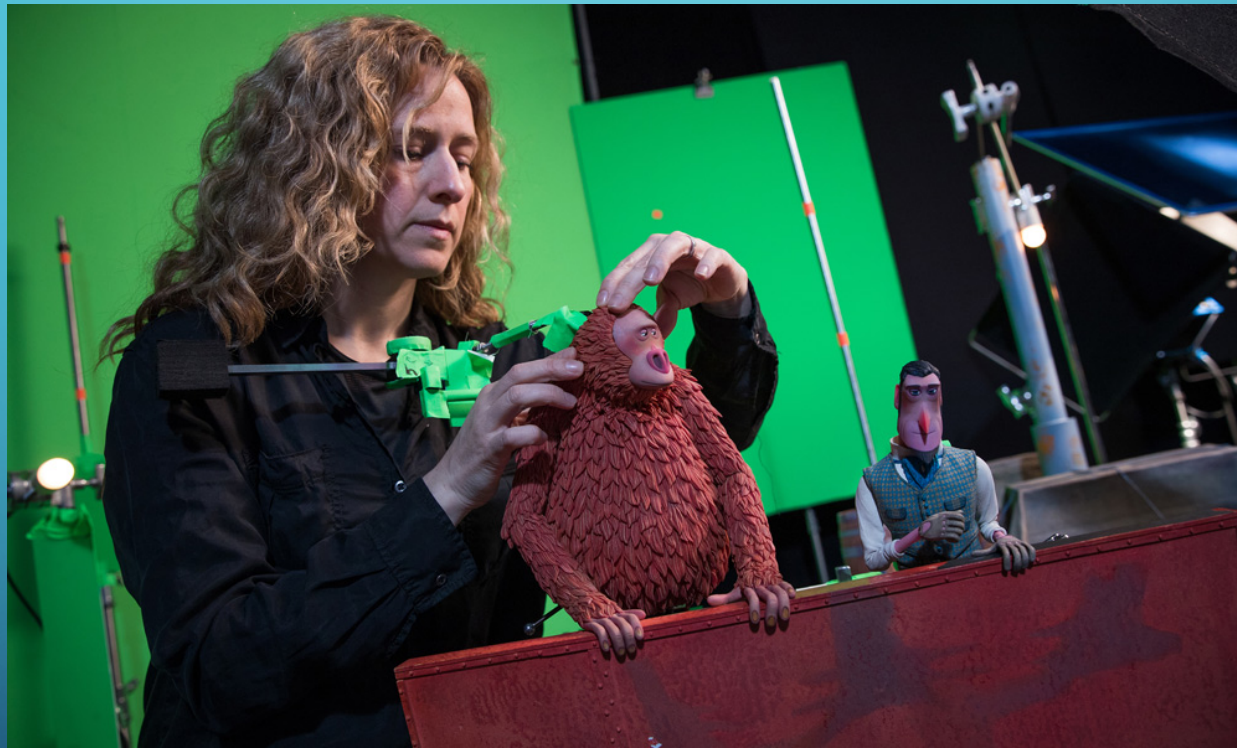
High Fidelity Interactive Video Segmentation Using Tensor Decomposition, Boundary Loss, Convolutional Tessellations, and Context-Aware Skip Connections. A. Rhodes, M. Goel.  
Intel Corporation



# SEMANTIC SEGMENTATION FOR VFX

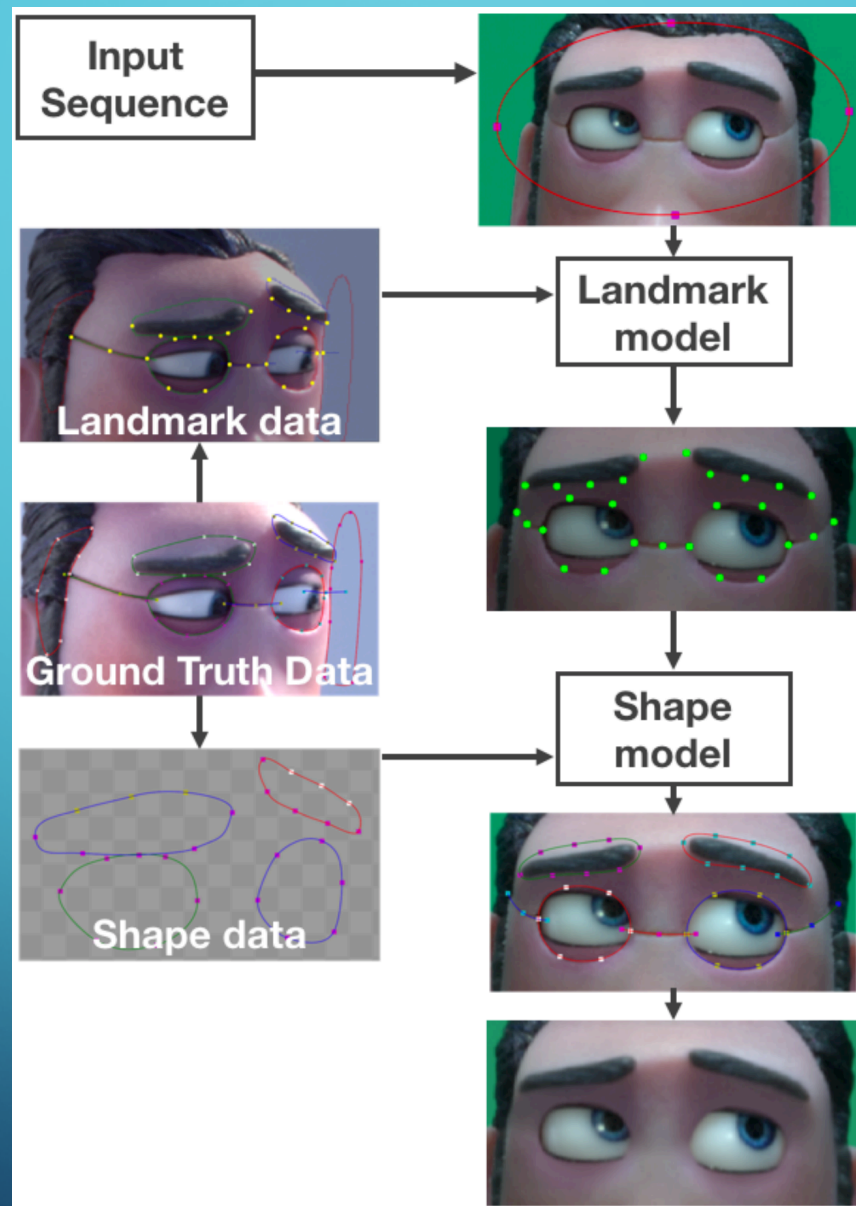


# 3D PRINTED





# ALGORITHM



# PROBLEM

- Professional Rotoscoping Artists
- Millions of Labels
- Seasonal Hiring
- Nuke VFX Software
- Data Privacy

This is the problem we run into time and time again...



# DATA EFFICIENCY



# OLD MOVIES

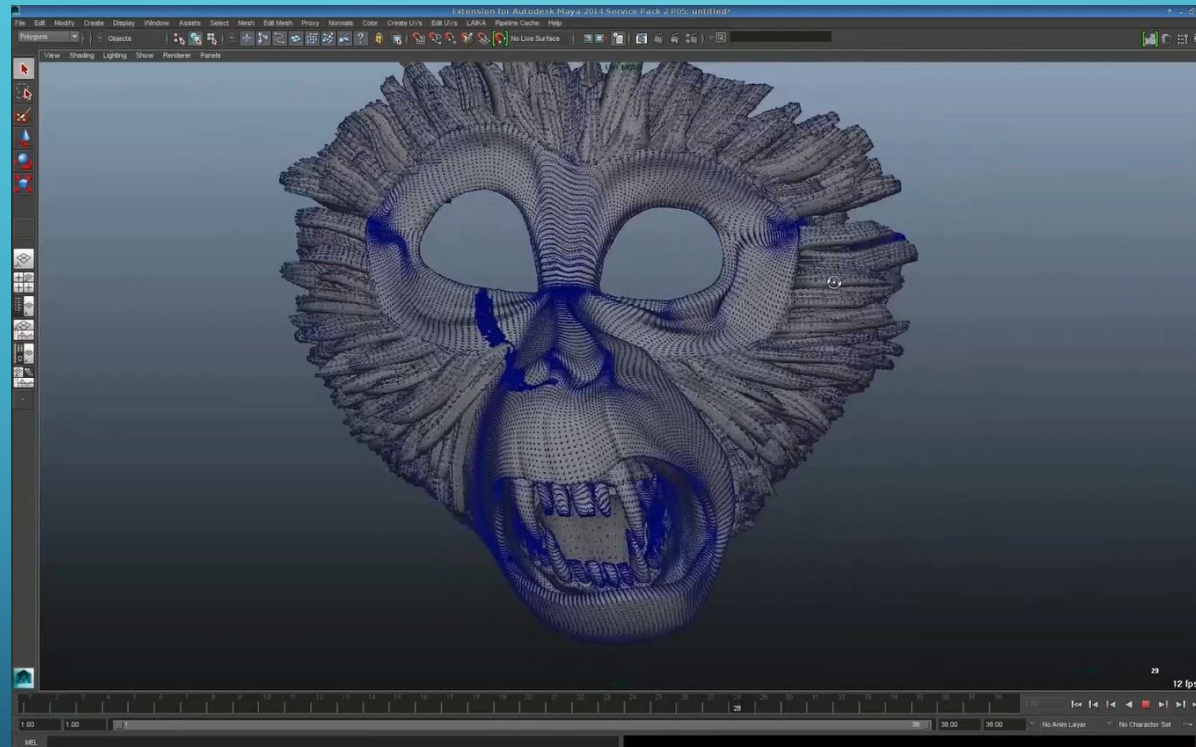




# DOMAIN



# SYNTHETIC DATA



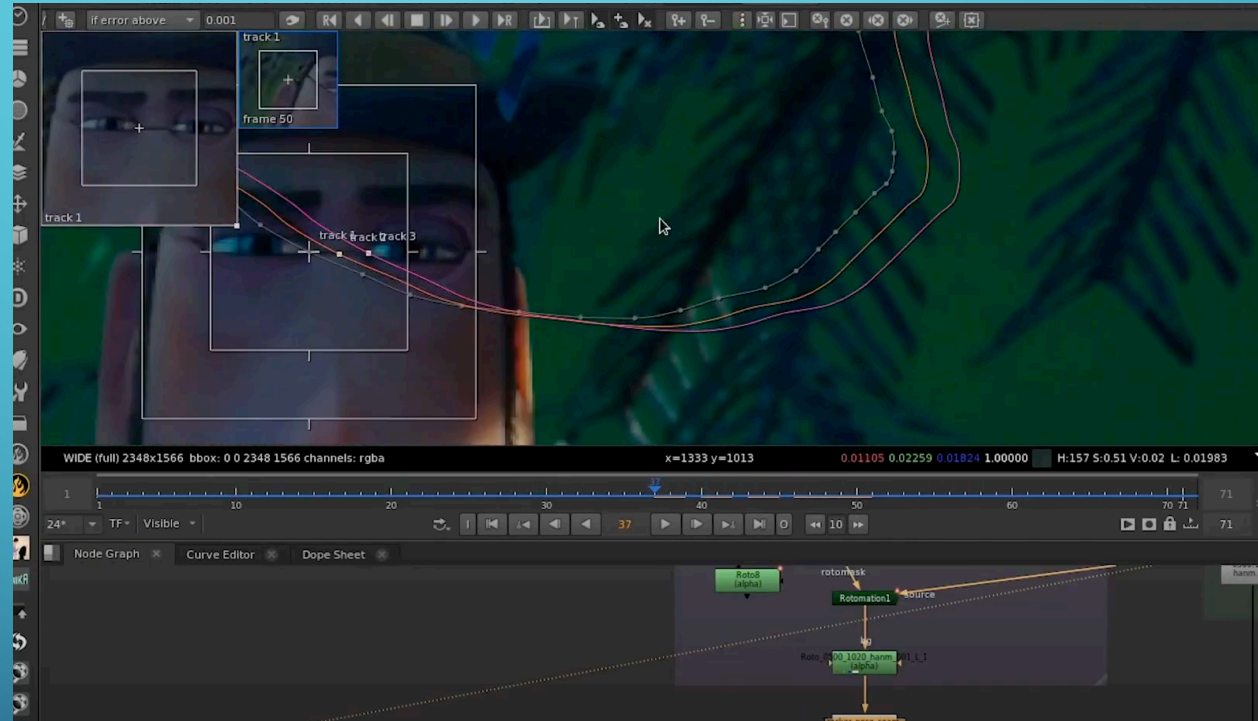


# FINAL RESULTS... ALMOST



# WORKFLOW INTEGRATIONS

- Nuke
- SilhouetteFX



# FUTURE WORK

- Domain Gap
- Optical Flow
- Optimization



# GENERALIZABILITY ACROSS CHARACTERS





# BEST PRACTICES

- Landmarks
  - Synthetic Data
  - Recycle Data
  - Augment Data
- 



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THANK YOU!

[beluis3d@gmail.com](mailto:beluis3d@gmail.com)

[twitter.com/beluis3d](https://twitter.com/beluis3d)