BEST PRACTICES FOR BUILDING COMPUTER VISION MODELS

LUIS BERMUDEZ
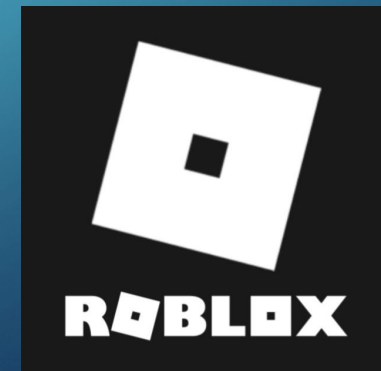
RESEARCH SCIENTIST

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

JOURNEY TO MACHINE LEARNING

SEMANTIC SEGMENTATION USE CASES

- Handwriting Recognition

- Visual Image Search
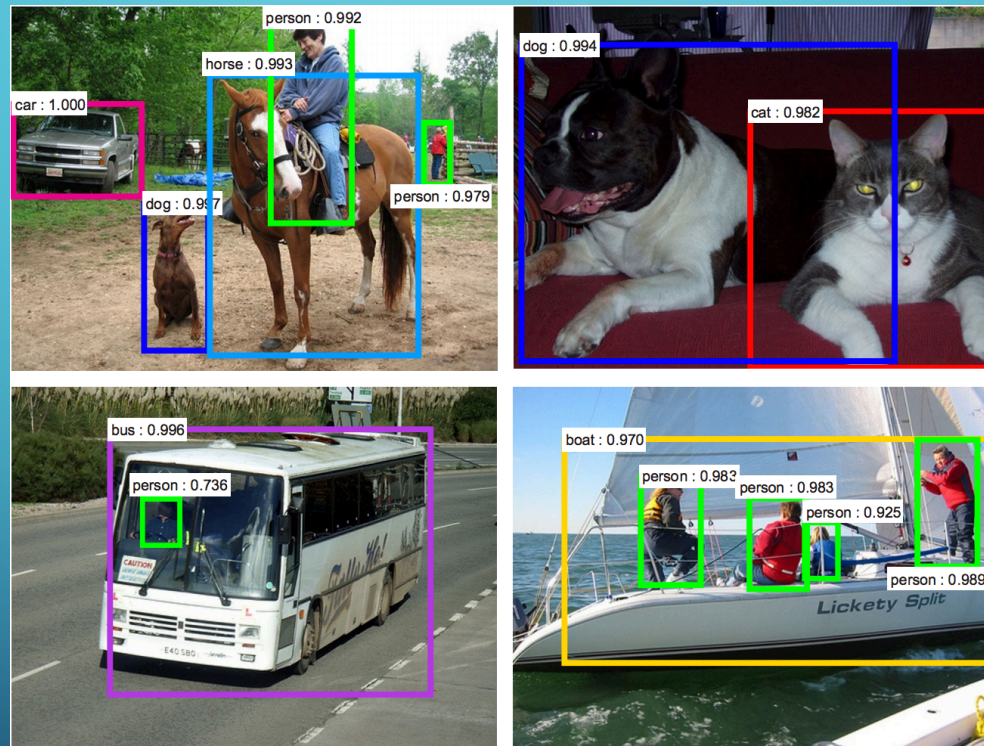
- Virtual Makeup

SEMANTIC SEGMENTATION USE CASES

- Portrait Mode
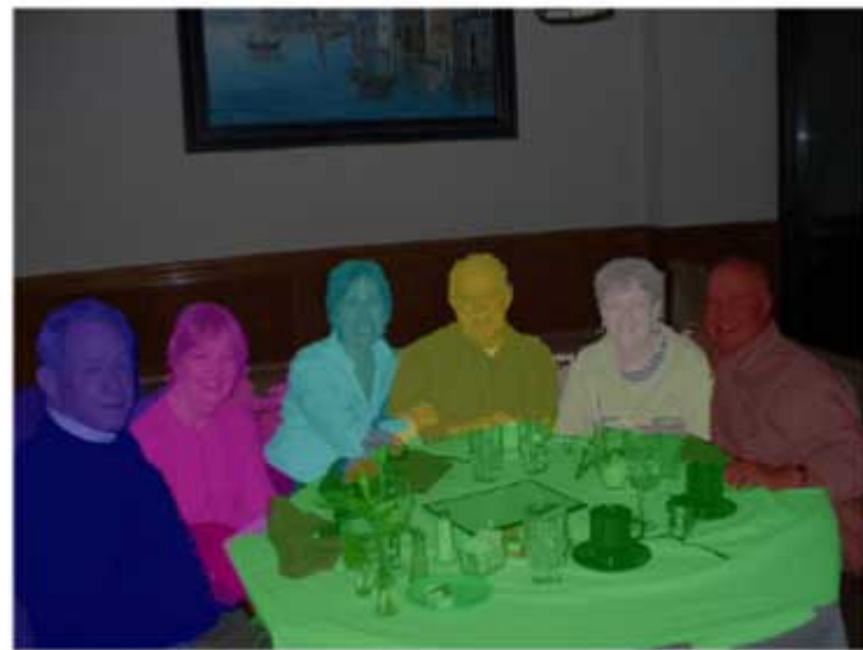
- Virtual Try On

- Self Driving Cars

OBJECT RECOGNITION
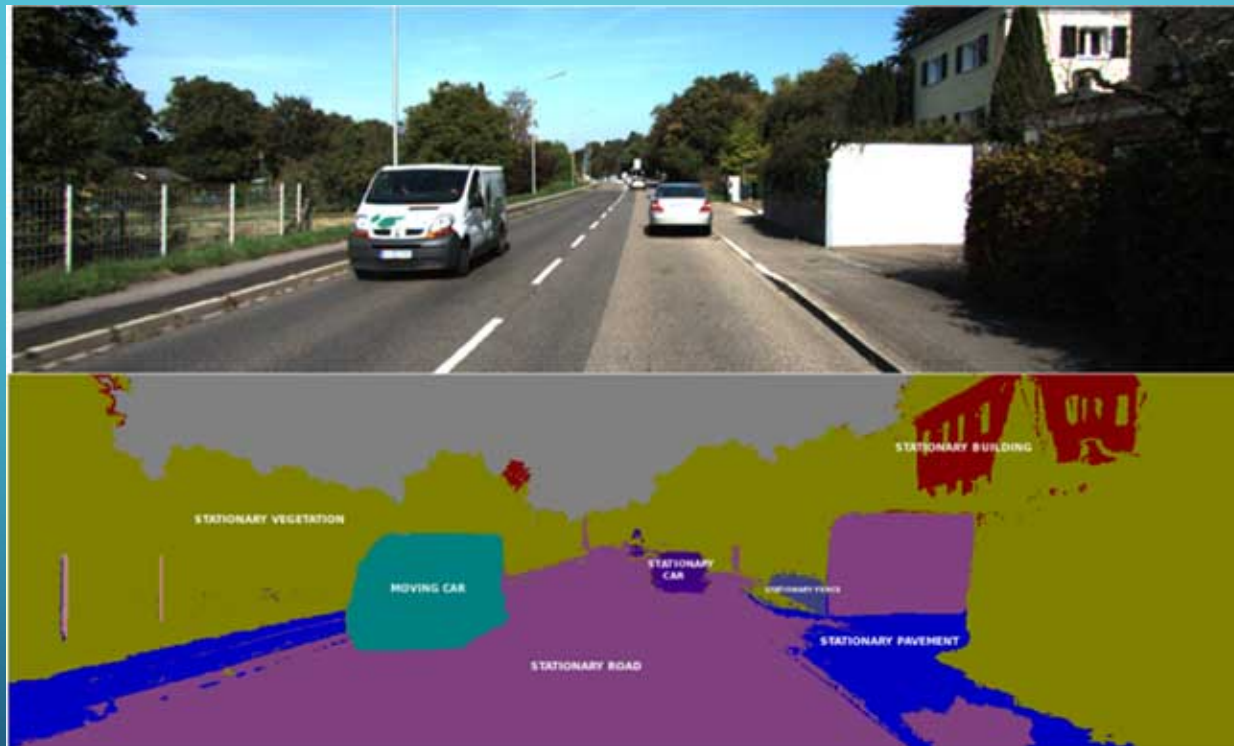
SEMANTIC SEGMENTATION
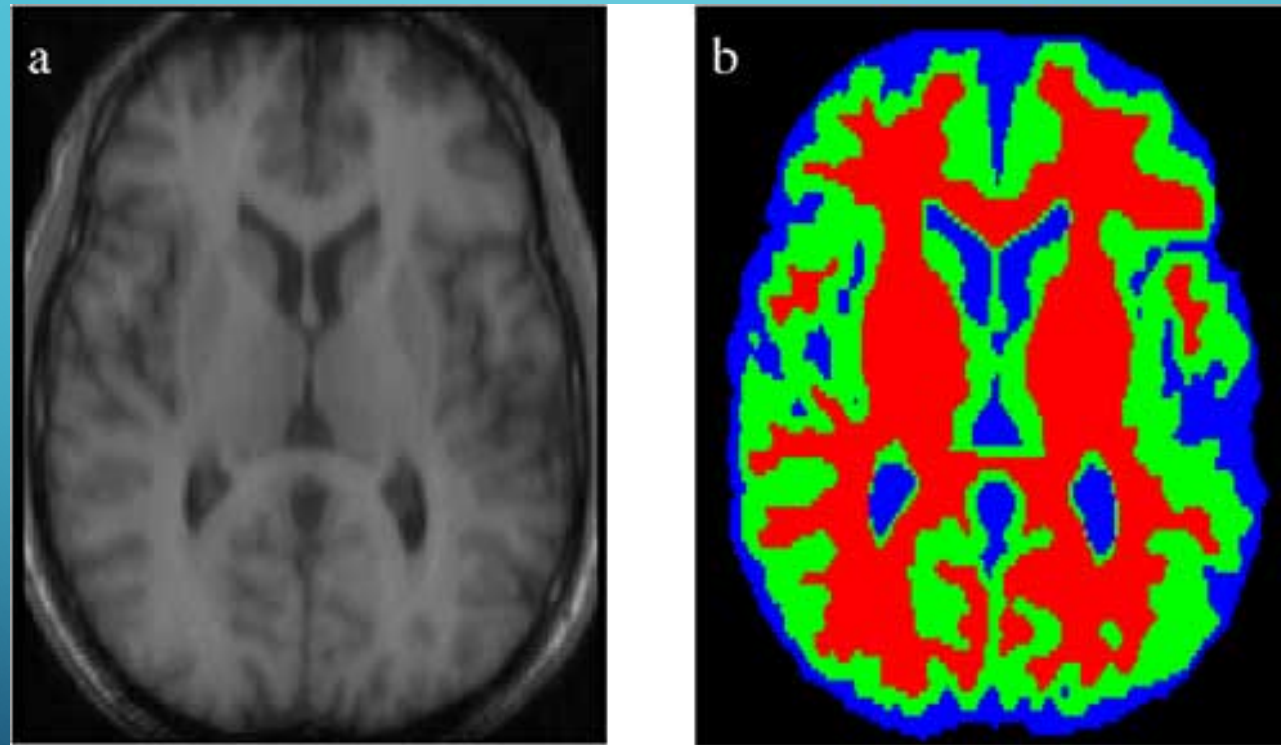

Semantic Segmentation

Instance Segmentation

SEMANTIC SEGMENTATION

SEMANTIC SEGMENTATION

TRAINING DATA

- Amazon Turk

- Third Party Labelling
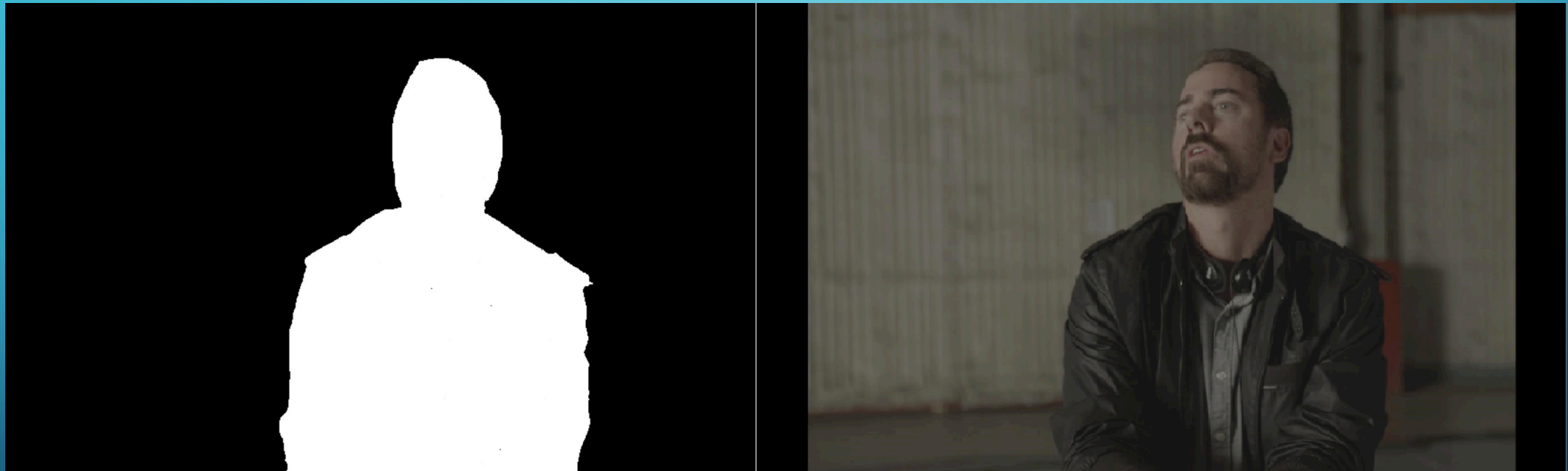
- Professional Labelling

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

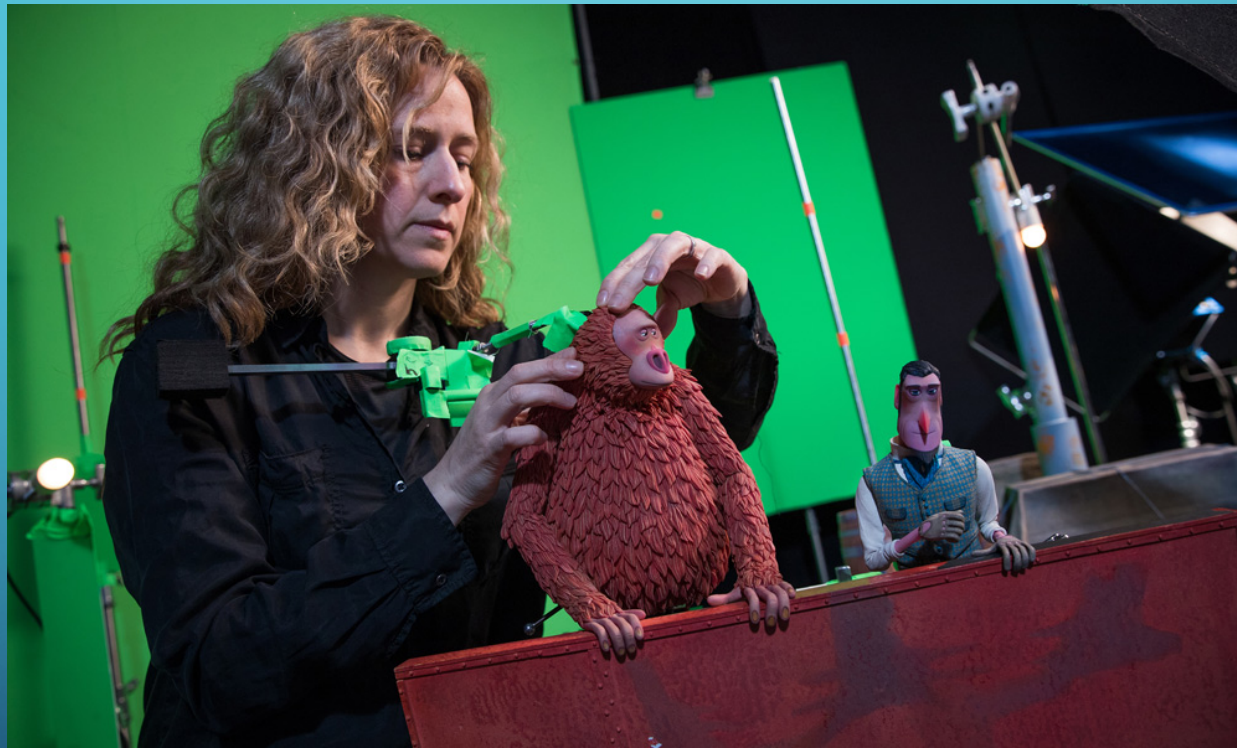- Mask R-CNN

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

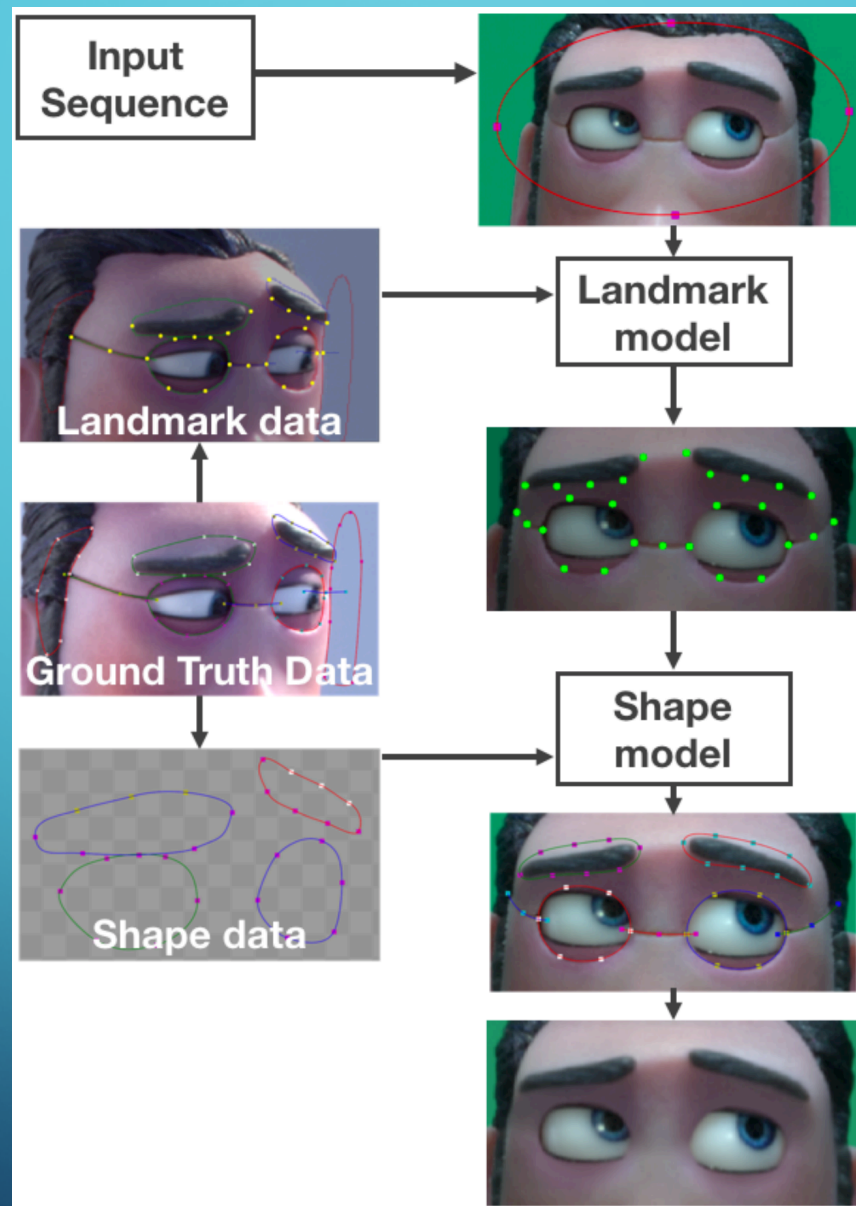# SEMANTIC SEGMENTATION FOR VFX

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…
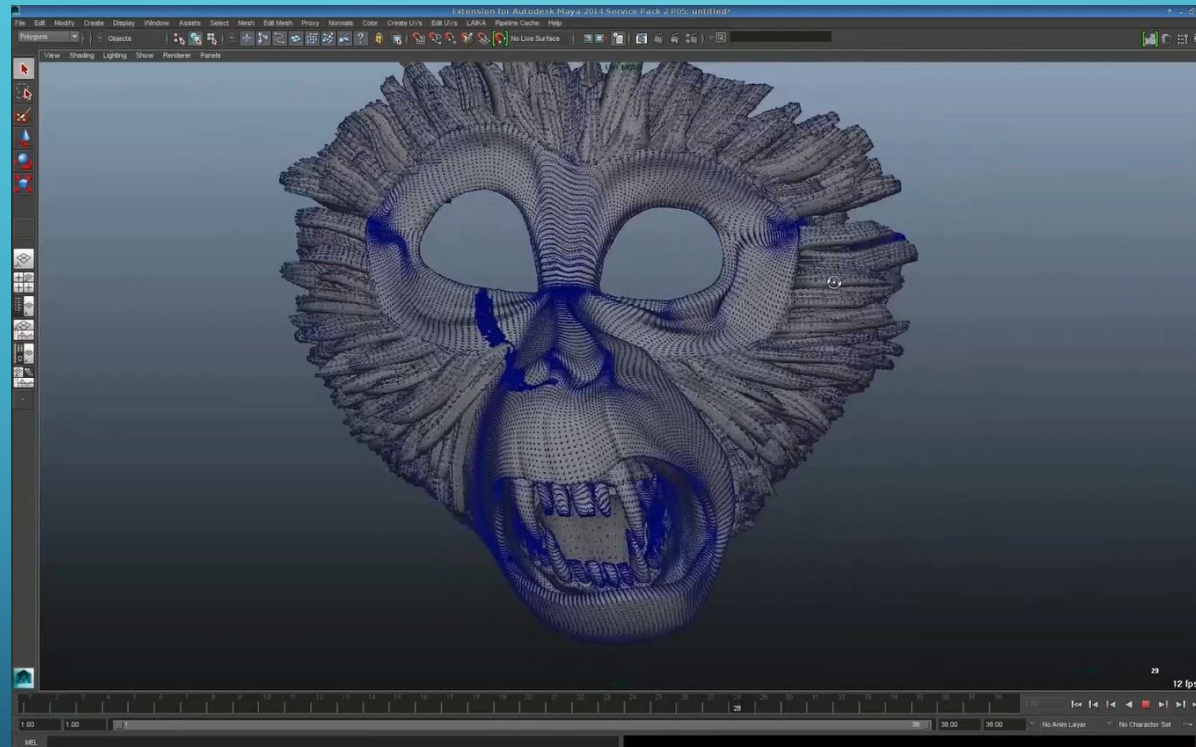
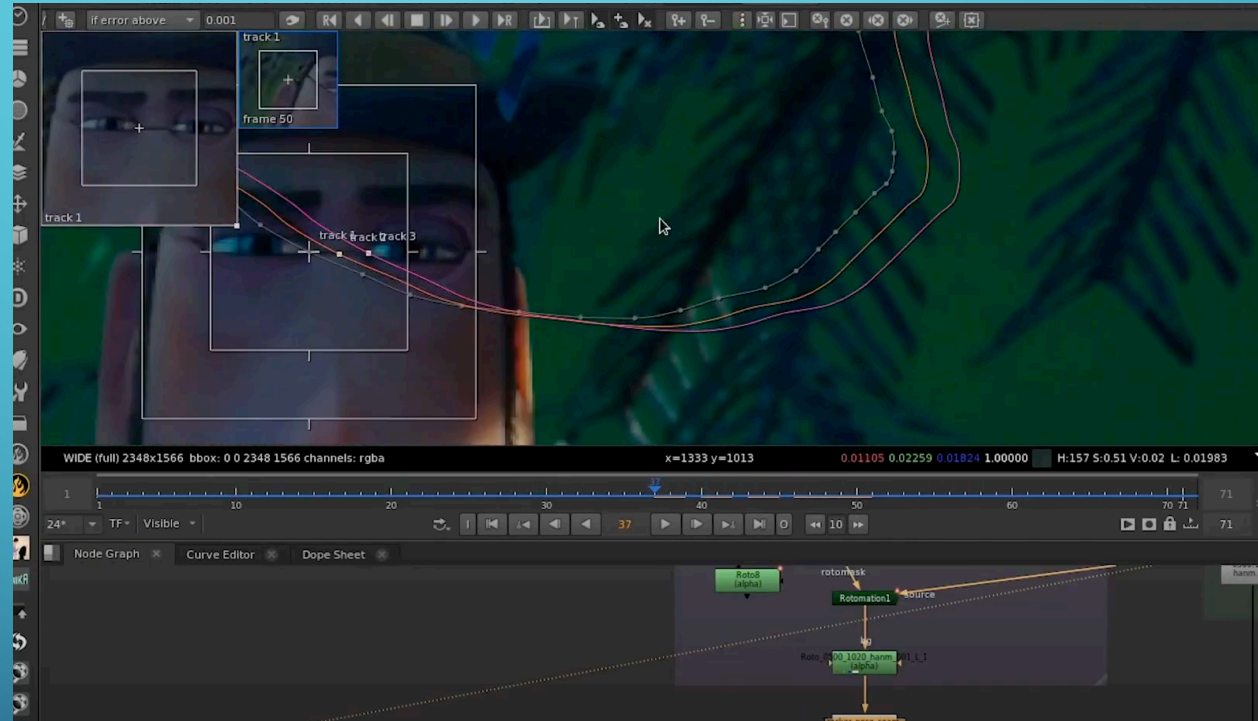# DATA EFFICIENCY

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

THANK YOU!

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