

UMETRIX VIDEO

October 2019



Video Trends

6 hours per day

amount of time that U.S. adults now spend watching video

43 % of time

amount of time 18-34 year-olds spend consuming media on digital platforms

mobile data demand is exponentially growing, with video as the driver, reaching

~80 % of traffic

within just the next few years

growing competition

in video streaming services, on-demand and live TV

viewers are ditching cable for streaming
faster than anyone expected

66%

of the general population
pay for subscription video on-demand service

service

Facebook Live

YouTube

Fortnite

Roku Channel

Free Dive

Crackle

CBS All Access

Hulu

Starz

Amazon Prime

Apple

Showtime

Netflix

HBO Now

Sling TV

DirectTV Now

YouTube TV

Hulu Live

PlayStation Vue

Video Everywhere



Mobile



Home



Devices



VR



A

Typical Problems

Types of video impairments

- Buffering
- Freezing

Impacts to video quality (MOS)

- Blockiness
- Blurriness
- Packet loss
- Noise



How to Measure Video Quality



Multi

- Small Screens
- Large HD Screens
- Large 4K Screens

Measure
Packets

Good

Measure
Frames

Compare
Frames

Better

View Pixels
Like a Person

Best

An Innovative Non-Reference Approach



Live



Chat



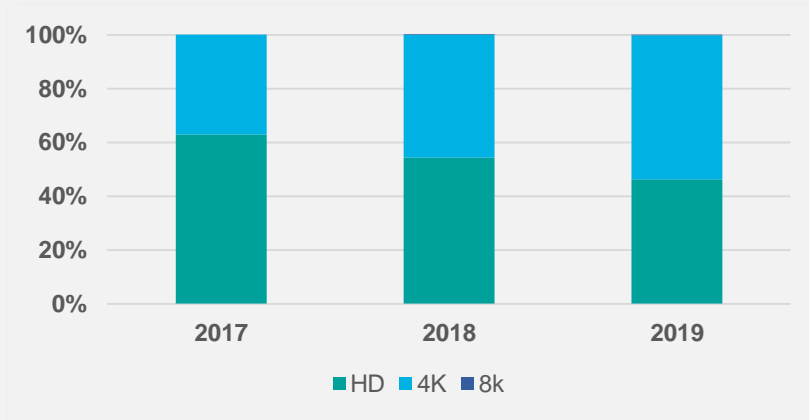
On-demand



Spirent Umetrix® Video
Using AI to see like your eyes do

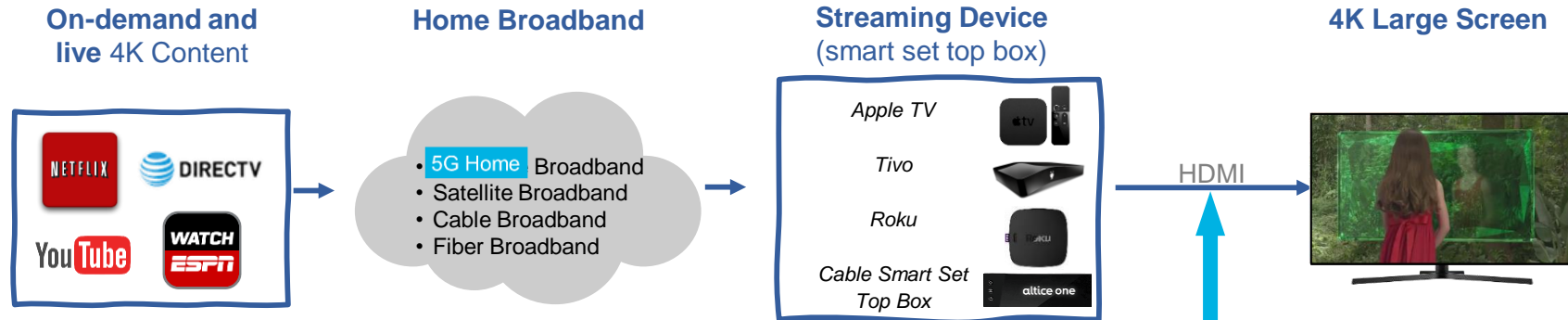
4K

- 4K is one of the 5G Use Cases
- Quickly Becoming “The Standard” for TV Sales



- If 4K doesn't perform as well as HD, why pay for 4K?

TV Service and Media Streaming Devices




What can we TEST

- ✓ **Streaming Delivery:**
HBO on T-Vision vs Verizon 5G
- ✓ **Live Sports Delivery:**
ESPN Soccer on AT&T Direct TV vs. Comcast
- ✓ **Streaming Player:** Roku vs Tivo vs Apple



Casting

On-demand, and
live 4K Content Wi-Fi
casting
media path Wi-Fi
Control
path

4K Streaming Device

Amazon Fire Stick

Roku

Apple TV

Google Chromecast

HDMI

4K Large Screen



What can we TEST

- ✓ **Streaming Device:** Fire Stick, Roku, ...
- ✓ **Streaming Service:** Netflix, Hulu, ...

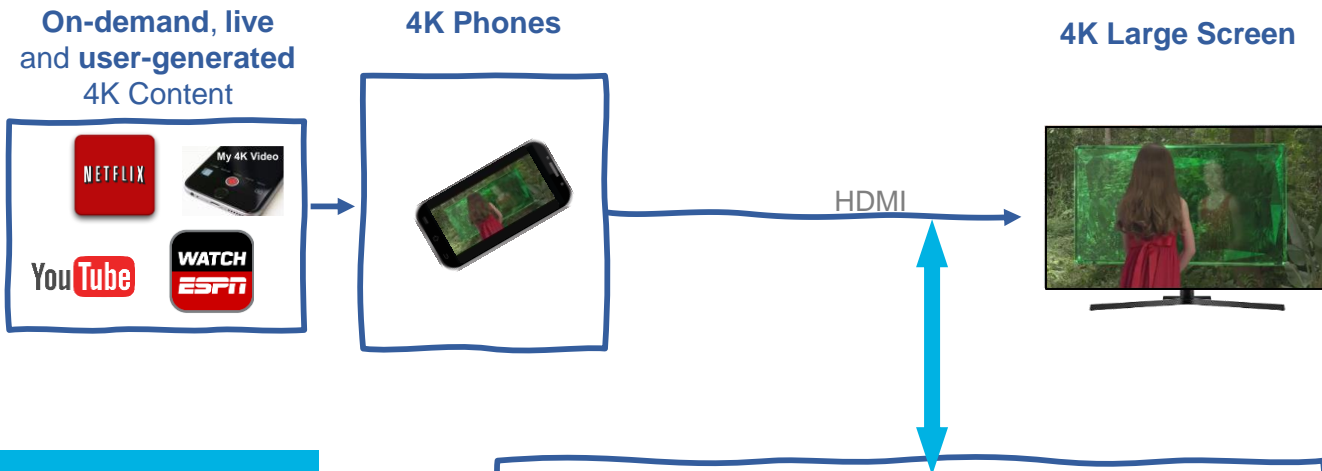


Umetrix Video 4K



- ✓ Buffering
- ✓ Freezing
- ✓ Blockiness
- ✓ Blurriness
- ✓ Packet loss

Tethering



What can we TEST

- ✓ **Streaming Device:** 4K Phones...
- ✓ **4K Content Source:** Netflix, YouTube ...



5G Home

4K Video Scenarios

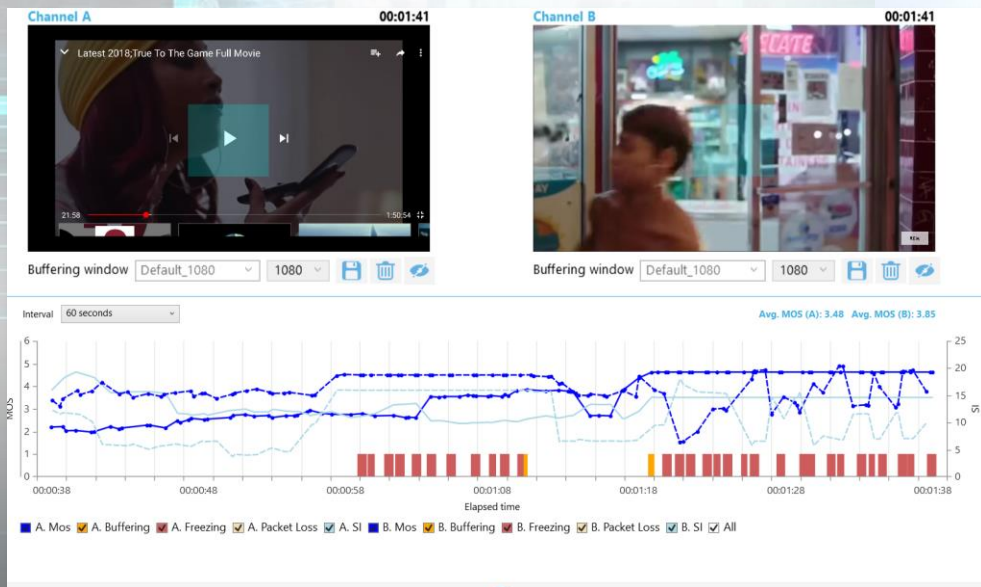


Tethering

What can we TEST

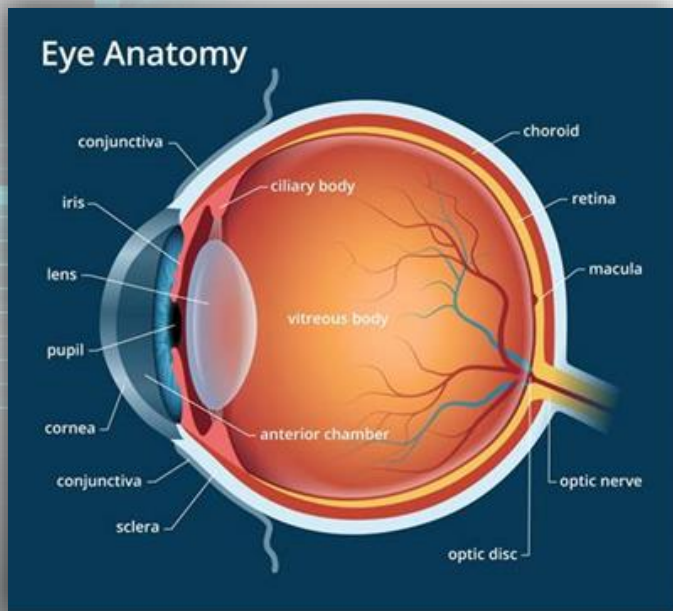
- ✓ **Streaming Device:**
 - 4K Phones...
- ✓ **4K Content Source:**
 - Netflix, YouTube ...



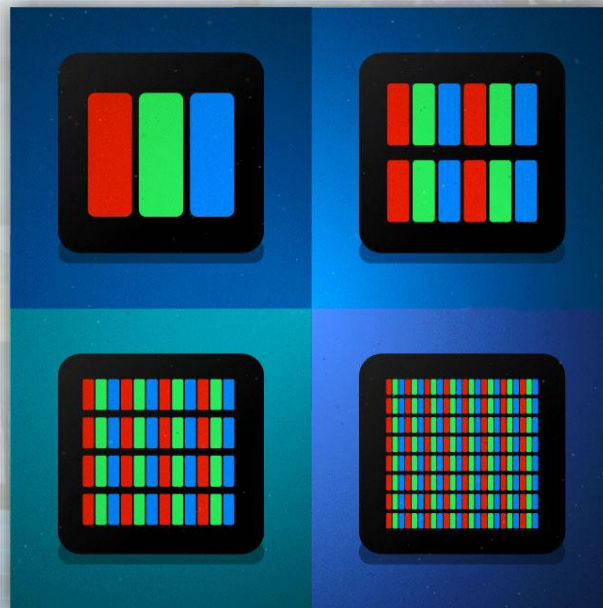


WHY WE HAVE DIFFERENT SCORING MODELS

Why Displays Matter



The eye can see a maximum
57 pixel per degree viewing angle



Video quality is affected by pixel
density, pixel size and viewing distance

Size Matter



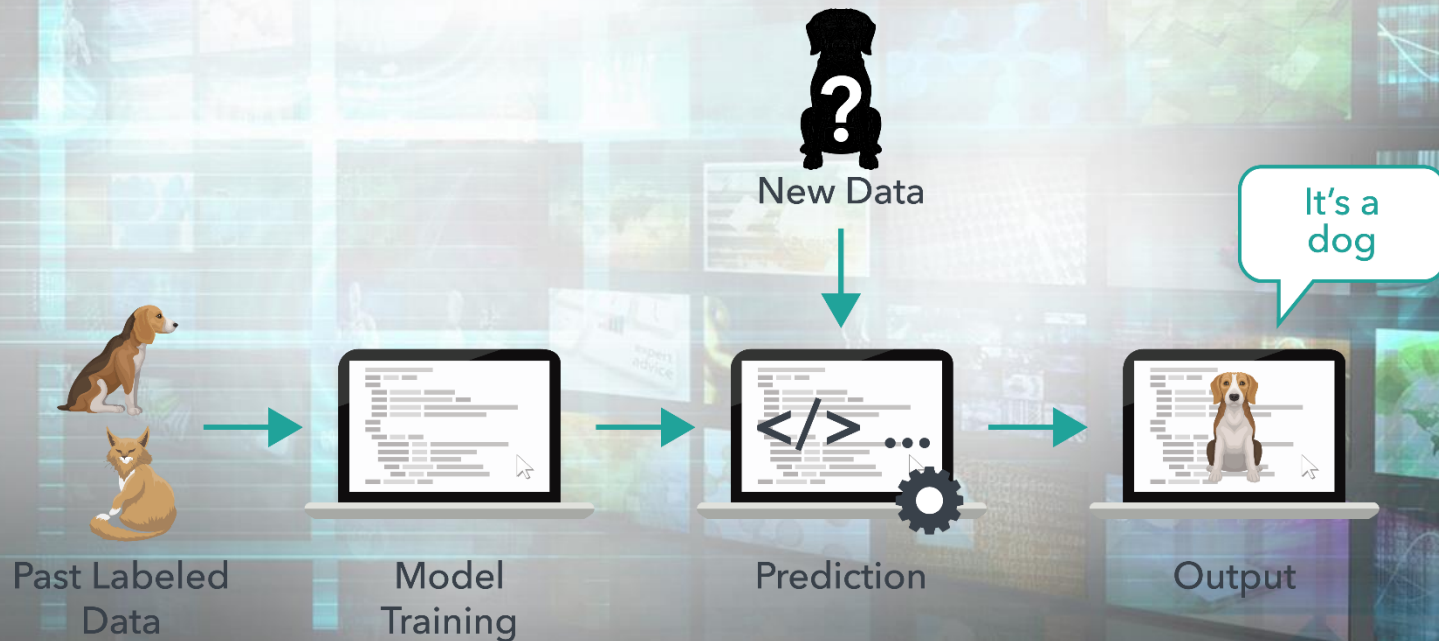
Size Matter



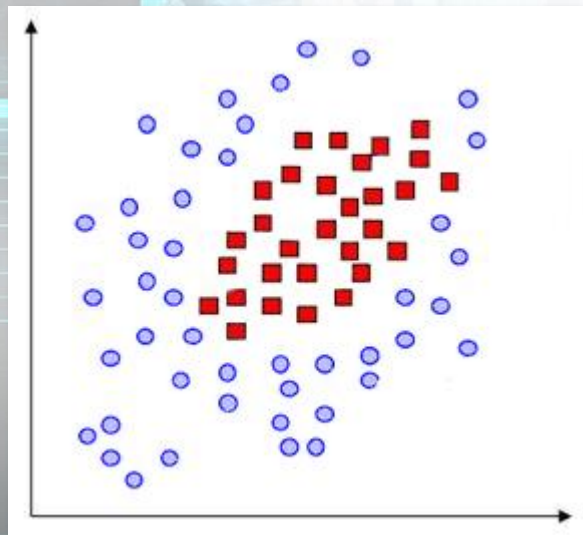


VIDEO & AI

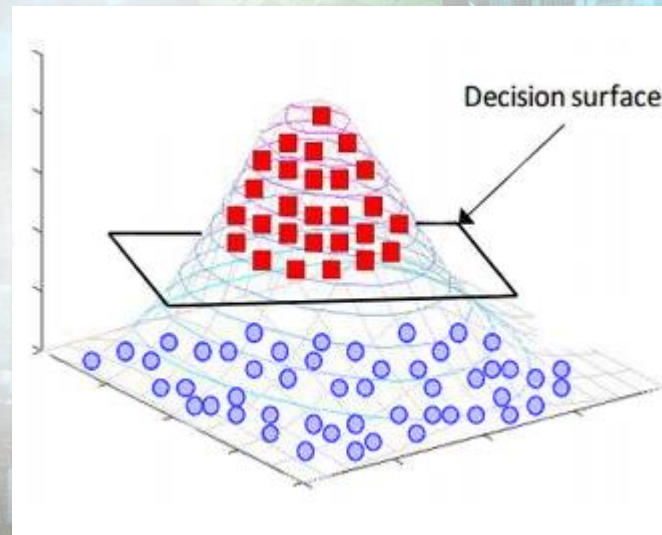
AI and Machine Learning



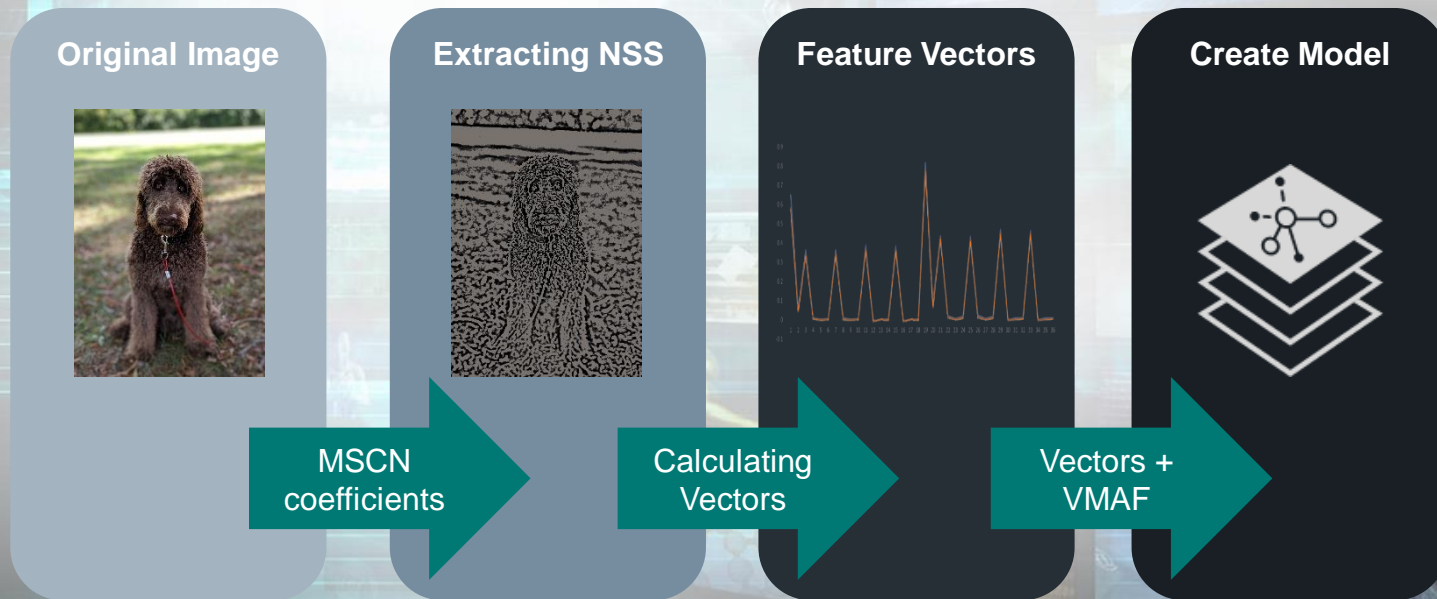
SVM | Support Vector Machines



Adding
Dimensions



BRISQUE



VMAF | Technology

Video Multi-method Assessment Fusion

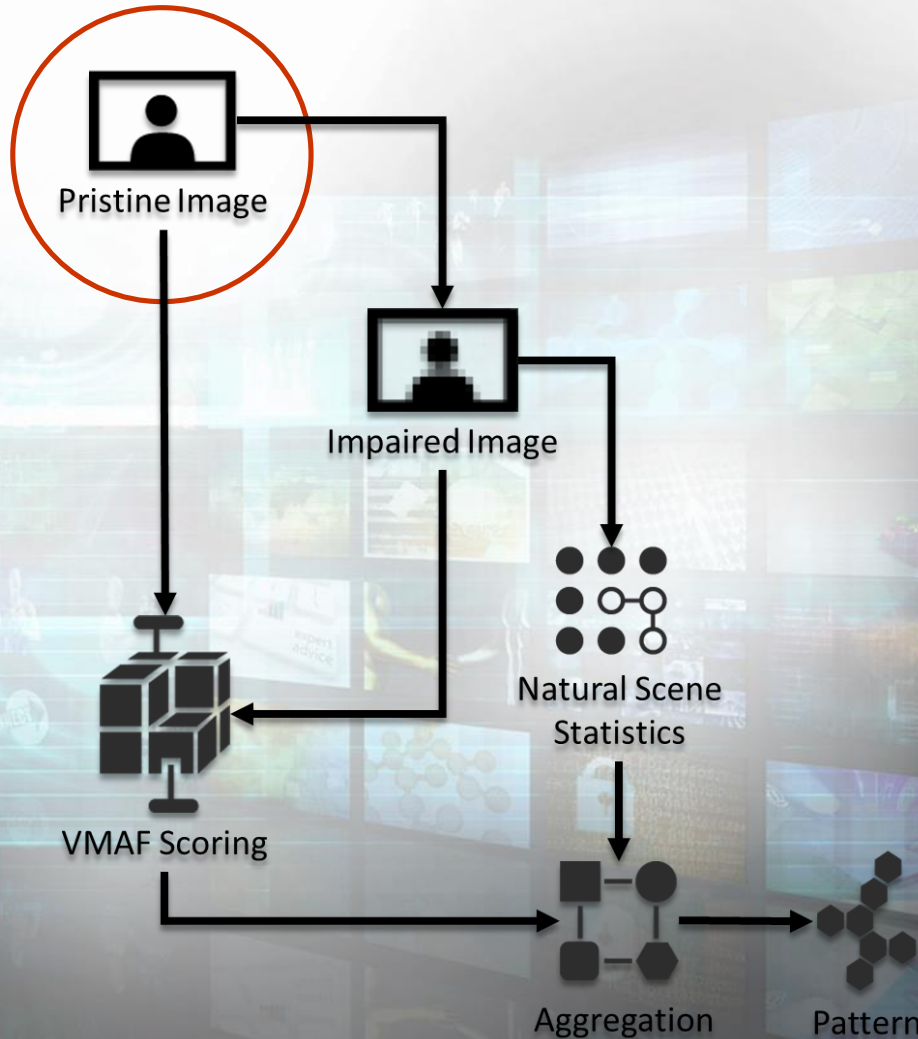
- Full-reference video quality metric
- Open-sourced by Netflix in collaboration with academia
- Model features include:
 - VIF
 - DLM
 - MCPD
 - AN-SNR
- Trained on subjective scores from research participants
- Continuously improved for performance and accuracy



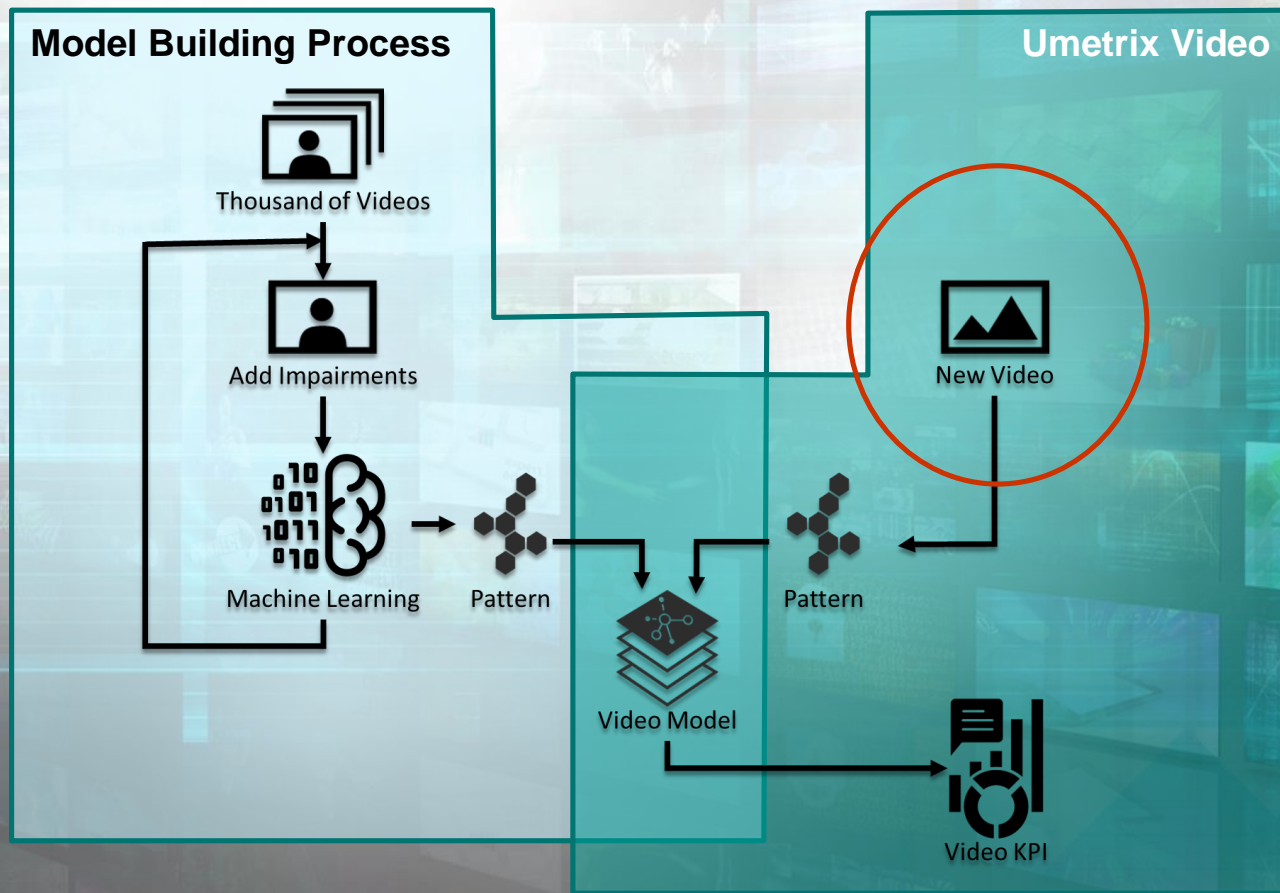
VMAF | Use

- Originally developed by Netflix
- All of Netflix's encoding ladder representations
- VMAF models are tuned to detect impairments
- VMAF scores can be used as ground truth when training non-reference models

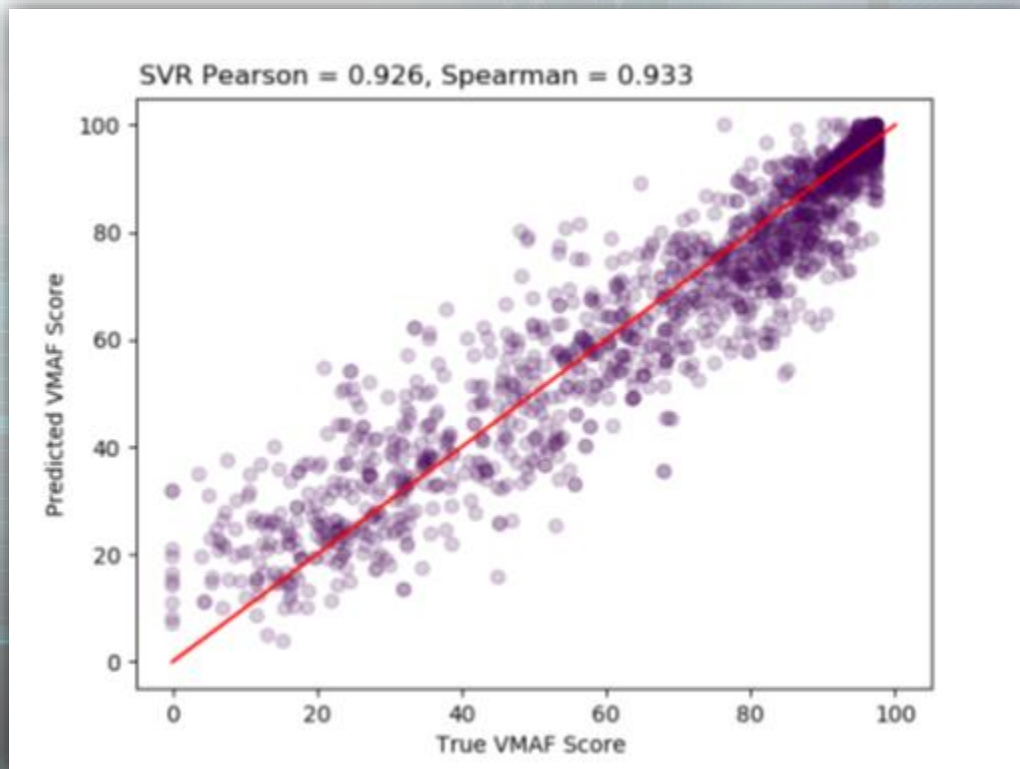
Machine Learning



AI-based NR Video Analysis



How well does it work?



Thank You

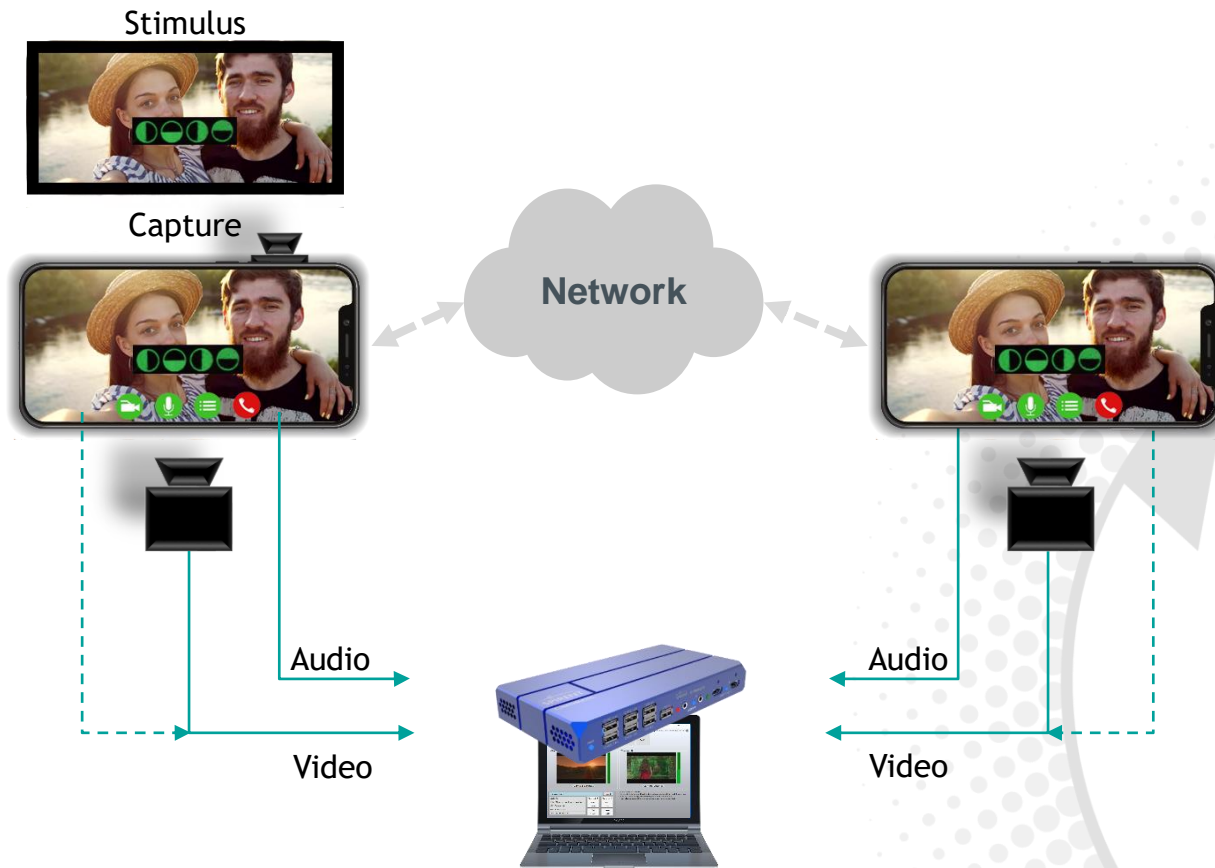


Learn about
Spirent Umetrix



SYSTEM SETUP

GED



Video KPI

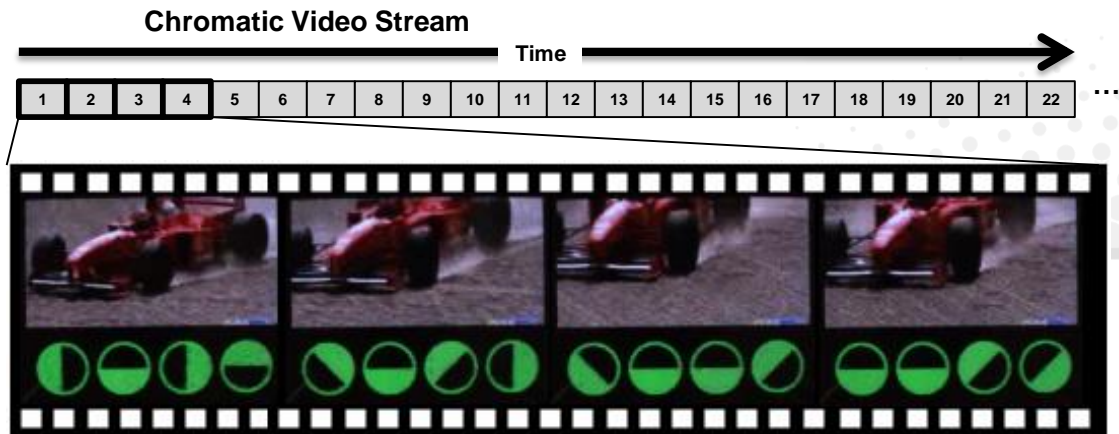
- Framerate
- Video Freeze
- Video Impairment
- Session Score
- Weighted Session Score

AV Sync KPI

- AV Sync
- Segment Count
- Segments Within Limits

Video Chat KPI

- Framerate
- Video Freeze
- Video Impairment
- Session Score
- Weighted Session Score



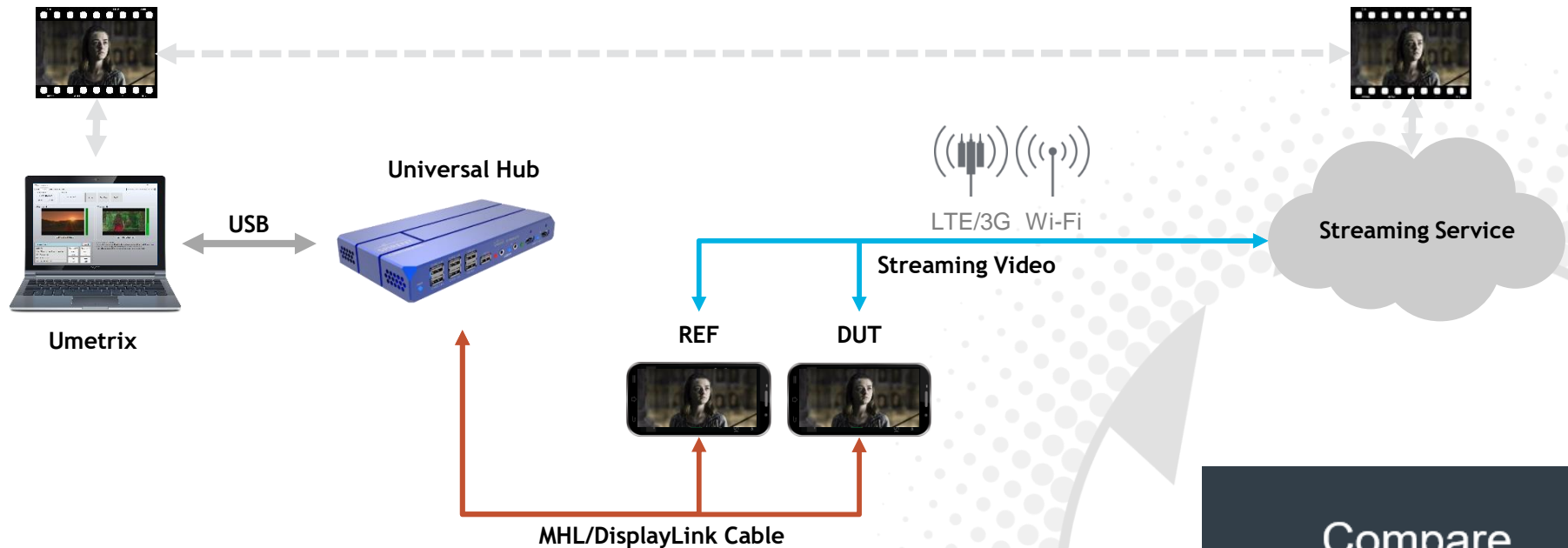
Each individual frame in the test video stream is marked with symbols that represent the frame number



Measure
Frames

Good

Full Reference



Compare
Frames

Better

- PEVQ MOS
- Distortion Indicators
- Delay
- Brightness
- Contrast
- PSNR
- Jerkiness
- Blur
- Blockiness
- Frame Skips and Freezes
- Effective Frame Rate
- Temporal and Spatial activity

Umetrix Video

Streaming solution overview

