

# Optimal Hyper-parametrization for efficient Video Compression



## **Video Compression Hackathon - SBI** Powered by Microsoft Corporation Pvt. Ltd.

# Problem

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- Storage and retrieval of these video files is a challenge especially given the expected tsunami of video files that are expected to be generated on extending more use-cases to our client base of over 45 crore customers.

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- These methods have been used heavily in all domains.
- I made use of the same to learn optimal parameters for a vast array of these.

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- These methods were tabulated into 4 optimal settings in `vals.txt`
- Then, these were made use of for encoding using x265.

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- The Encryption Algorithm used was AES.
- We also used zlib for further compression.

## Video used

- phase3.mp4
- Profile : H.264
- Dimensions :  $1920 \times 1080$
- FPS : 30.0
- Bit-Rate : 17036 kbps
- Size : 127.8 MB
- The file may be found [here](#).

# Decompressed Video

- phase31.mp4
- Profile (Main) : H.265
- Dimensions :  $1920 \times 1080$
- FPS : 30.0 (as expected)
- Bit-Rate : 1381 kbps
- Size (compressed) : 9.5 MB

# Hardware Details

- CPU : Intel(R) Core(TM) i5-1035G1 CPU 1.00GHz
- Memory : 8 GB
- Memory Clock : 3200 MHz
- L1 Cache : 128 kB
- L2 Cache : 2 MiB
- L3 Cache : 6 MiB

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- Different Types of applications provide scope for different types of compression shorthands.



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- Our approach enables us to learn these shorthands

# Functional Requirements

- x265
- opencv4
- Python's cryptography
- Python's zlib
- ffmpeg

# Corresponding Microsoft Tools

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All these tools are easily available in Azure Cloud Services and thus, can be used to leverage the application into production.

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- **Pre-requisite** :If the Bank could provide us with a training set of videos, it wants to compress/encrypt, we would get vastly better results!
- **Infrastructure** : Azure Cloud Deployment
- **Time Required to setup** : 2-3 Weeks (Debugging included!)

# Non-functional Requirements

- The Video isn't recorded in camcorders which make use of Compressed Sensing.
- The Noise is minimal and patterns in the images remain consistent.
- The Machine on which the Application is used has  $\geq 8\text{GB}$  RAM.
- This would enable greater compression due to easier Identification of Generic features.

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- HEVC is known to better than state-of-the-art Deep Learning Methods (*DeepCoder*) by an additional 50 %.
- Use-case specific optimization in *HEVC* is generically obtained by making use of hyperparameter optimization.
- Feedback functions could also be tinkered to better reflect our Requirements (should they ever change!)

# Github Repository

My Actual Github ID is thevaliantthird

I've kept the Video Hackathon submission Repository via another profile,  
SBI-Video-Hackathon

# Video Demonstration

I have demonstrated usage of my application here.



Thank You!

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