MediaTek Global Motion Compensation Supplement

2024.05.10

Outline

- Schedule
- Data
- Evaluation
- Code Submission
- Report Submission
- Grading

Schedule

- Evaluation server open
  - 2024/05/11 00:00
- Evaluation server close
  - 2024/06/07 23:59
- Code submission to NTU COOL
  - 2024/06/08 23:59
- Oral presentation
  - 2024/06/14 14:20~15:20 (Tentative)
- Report submission
  - 2024/06/14 23:59

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Data

- One video sequence
  - Download link: http://140.112.48.121:5000/sharing/ahoZKsMDw
  - Access the pixel value byte by byte. Here is an example of how to read the luma frames from the file. (see yuv2png.py for detail)

```
def convert(yuv_file, output_dir):
    f_y = open(yuv_file, "rb")
    w ,h = 3840, 2160
    seq_len = 129
    frame_size = int(3/2 * w * h)
    for frame_num in range(seq_len):
        converted_image = Image.new('L', (w, h))
        pixels = converted_image.load()
        f_y.seek(frame_size * frame_num)
        for i in range(h):
            for j in range(w):
                y = ord(f_y.read(1))
                pixels[j,i] = int(y)
        converted_image.save(os.path.join(output_dir, '%03d.png' % frame_num), "png")
```

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Evaluation

- For each luma frames, we calculate the PSNR using the equation:

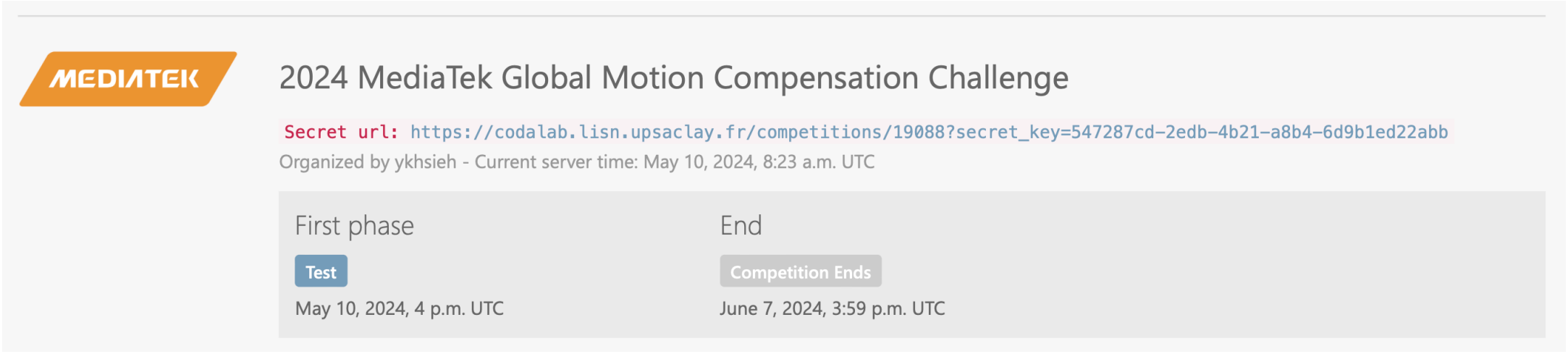
$$PSNR = 10 \times \log_{10}\left(\frac{255}{MSE}\right) \text{ where}$$

$$MSE = \frac{\sum(Gt - Pred)^2}{Total\text{-}Samples} \text{ . Here,}$$

- GT represents the selected ground truth blocks
- $Pred$ represents the selected prediction blocks, and
- $Total\text{-}Samples$ is the number of selected samples (13000 * 16 * 16).
- Finally, we will average the PSNR of each frame to obtain the final score.

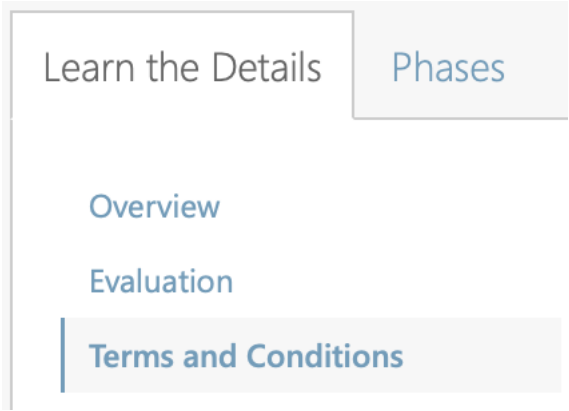
Evaluation Server

- Our project is hold on Codalab Competition server.
- Link: MediaTek Competition
- Please refer to “codalab competition on NTU COOL“ for registration details.



Evaluation Server: Submission

- Refer to the **"Terms and Conditions"** on codalab page for detailed imformation regarding directory architecture and file naming.
- You are required to generated motion-compensated **luma frames (.png)** for frame indices **1~31, 33~63, 65~95, and 97~127, totaling 124 frames** and corresponding **selection maps (.txt)** indicating which blocks to use for scoring.
- If the submission file **exceeds the size limit** of the Codalab server (300Mb), you can attempt to reduce the size of the png file by setting the pixel values that are not in the selection map to 0.
- It is possible that **the submission will take over 20 minutes** due to large file size. Please be patient and wait for it to complete.



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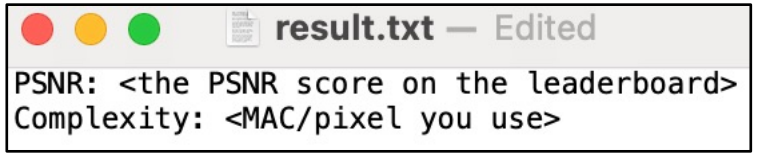
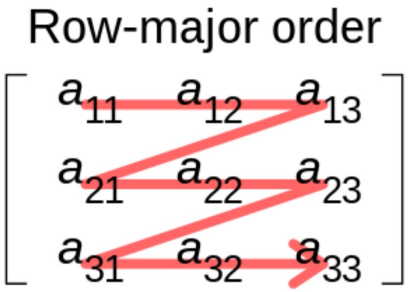
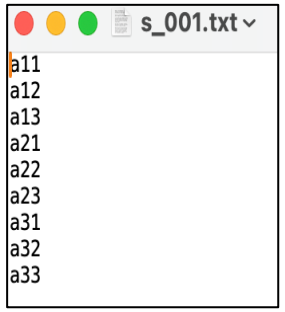
Code Submission: NTU COOL

- R07654321/
  - README file
  - Source code (which can **reproduce** the result on the leaderboard)
  - result.txt (as the example)
  - Compensated monochrome luma video (e.g. video.yuv)
  - Selection map (s_001.txt ~ s_127.txt except s_032.txt, s_064.txt, s_096.txt)
  - Model map (m_001.txt ~m_127.txt except m_032.txt, m_064.txt, m_096.txt)
  - Brief description of models and your method (pdf file; content is not restricted; serve just as a reference for the selection of teams for oral presentations)
- Compress all the files in a zip file named **StudentID.zip** (e.g. R07654321.zip)
  - Upon extraction, only one directory named R07654321 should be generated.







Code Submission: NTU COOL

- **Only the team leader** need to upload the code to NTU COOL.
- In the README file, you have to **clearly describe** how to set up the environment (ideally by providing bash script) and the steps to run your code, so that TA can **reproduce the result**.
- If we can not reproduce your result on the leaderboard, you will **receive 0 point** in the performance part. Minor errors are acceptable.
- We will excute your code on **Linux system**, you should make sure your code can be excuted on Linux system before submission.
- **Deadline: 2024/06/08 23:59**

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Report Submission: NTU COOL

- **Only the team leader** need to upload the code to NTU COOL
- The teams who are selected for final presentation need to upload your presentation slide in **pptx format**.
- The rest teams should upload your report in **pdf format**.
- TAs will open the submission place later.

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Grading

- Objective Quality: 50%
  - PSNR scores
    - **This will based on your summited result.txt except if violations are found.**
  - Constraint Violation:
    - Not follow the Hierarchical-B processing order (-5%)
    - Use over 12 models in a picture (-5%)
    - Complexity > 400KMAC/pixel (-5%)
    - Copy golden data directly (-50%)
- Presentation: 50% (selected presentation teams)
  - Novelty and technical contribution 20%
  - Experiment completeness 25%
  - Presentation 5%
- Report: 50% (other teams)
  - Novelty and technical contribution 25%
  - Experiment completeness 25%

Points	# of teams
50%	1
48%	2
46%	2
42%	The rest teams /4
38%	The rest teams /4
34%	The rest teams /4
30%	The rest teams /4

Reminder

- Please start working on the project as early as possible.
- Please read and follow the rules carefully.
- **Taking any unfair advantages (e.g., plagiarism) over other class members is strictly prohibited. Violating university policy would result in F for this course.**
- If not sure, please ask TAs.
  - NTU COOL 討論區 or email to ykhsieh@media.ee.ntu.tw (謝郁楷)