YouTube Data Collection Using Parallel Processing

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Agenda

• Motivation
• Data Collection Methodology
• Function Overview
• Performance
• Conclusion
• Future Work
Introduction/Motivation/Goal

- YouTube is 2nd largest social media platform
- 10 Exabytes of data has been generated by YouTube
- Challenges of YouTube Analysis—
  - Slow sequential processing of API requests
  - API key daily usage limits
Data Collection Methodology

1. Obtain a YouTube Data API key

2. Develop a function to submit & process YouTube Data API requests

3. Store data for analysis
Looping through content IDs sequentially, making API requests one at a time

```python
## - Single Process - ##
def single_process_video(video_ids):
    for video_id in video_ids:
        process_video(video_id)
```
Splitting the Content IDs between 5 Nodes, making API requests in parallel

```python
## - Parallel Process - ##
from pathos.multiprocessing import ProcessPool as Pool

def parallel_process_video(video_ids):
    #Creating a processing pool of 5 processes
    process_pool = Pool(nodes=5)

    #Mapping each video_id onto the process_video function
    process_pool.uimap(process_video, video_ids)

    process_pool.join()
    process_pool.close()
```
• Based on data processing times for FPSRussia channel

• A 400% decrease in processing time

• Biggest improvements from 1-5 processes
Conclusion/Future Work

- Parallelization of YouTube data collection dramatically decreases processing time
  - I/O bottlenecks are distributed across multiple processes
  - CPU can switch between processes while awaiting an API response
- Parallelized API requests can be used on other social media sites
  - Twitter
  - Reddit
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Thank You

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