FIT 3162 Computer Science Project 2
TEAM MANAGEMENT REPORT
GPU Acceleration for Raster Filter Using APARAPI

Group 9

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Table of content

1. Overall Team Experience

1.1. Overview

We acknowledge that team management plays a huge part in the success of a project. Team management includes the team's communication, task allocation and also the team's sense of accountability. This also includes how the team managed to work through the problem encountered during the project. During the initiation of the project, there is great enthusiasm and everyone participated in the meetings and discussion. However, when working on the actual project, there is no actual contribution and there is small progress. This is due to the difficulties that the team encountered and the lack of accountability by some members. In this report, we would like to discuss the team management aspect of the project.

1.2. Opportunities created

From this project, the members were able to gain a little bit of knowledge on parallel computing. This includes the basic understanding of GPU and on general purpose GPU computing. The members were able to recognize patterns and parts that could take advantage of the GPU's parallelism in a code. While researching on the topic, the members gained knowledge on the way APIs work and its purpose. We also learned why using a high-level framework, such as Aparapi, is easier for most developers. We learned about the use of shaded relief images and how applying the raster filter onto these images is useful in real life applications, mostly for the purpose of identifying lineaments.

1.3. Difficulty Experienced

The difficulty which experienced during the development phase and testing phase is the procrastination of team members. As each member has their own assessments other than this unit to be completed, it is difficult to sustain the original schedule. Thus, the schedule has to be flexible enough, for instance, the member who has better progress will help those who are still struggling. Due to the pandemic outbreak, all of the units have switched to online learning and no offline activities on campus. It is the root of lacking face-to-face meetings or working sessions, resulting in the versatility of adopting Agile methodology. Thus, the project management method has switched from Agile to Waterfall.

Besides that, there are several communication problems which hinder the progress. As mentioned in the final report, the main communication tool that is used is Facebook Messenger, however, some of the messages might be ignored when there are more messages sent. Thus to mitigate the problem, we will also use a phone call to notify each member when the issue that was raised has a higher priority.

1.4. How task can be done differently

As mentioned above, due to the COVID-19 outbreak, it brings a huge impact on the project execution. For instance, online meetings and online workshops have reduced the flexibility to communicate with each member. Thus, we suggested that offline meetings can be scheduled in order to reduce the communication error among the team members. Furthermore, face-to-face workshop sessions have the benefits of increasing the efficiency of each member as the problem that is faced can be resolved on the spot.

Another thing that could be done differently was for the team to consider other options for the topic of the project. There were a lot of problems when we were working on this project and most of it stems from the lack of knowledge and understanding of this topic. It was possible for the team to consider other options or find other topics that are more manageable or ones that the team has a larger understanding of.

1.5. Task allocation

The task is allocated to each member equally. First, the task will be identified with priority, difficulty and urgency. The developer will tend to handle the more difficult task of developing the program, whereas the project manager will handle the more difficult task of the reports. However, each member will still have to complete their tasks, regardless of their roles. When the tasks that are allocated has a higher priority, a deadline will be set by the project manager such that each person will complete the assignment efficiently. A weekly online meeting is also scheduled after the workshop to trace the progress of each member. The Work Breakdown Structure will be updated every week and trackable in the group's Microsoft Planner.

1.6. Lesson learned

On the management side, the team learned the importance of teamwork and how critical communication is. There was a lack of teamwork due to the restrictions placed because of COVID-19. This does not allow the group to meet face-to-face and collaborate on the project, whether the program itself or the documentation side. Our only option was to do online meetings in order to discuss, but there are still limitations to it. Communication was also lacking as we could only communicate through the Messenger most of the time and from calls occasionally. This is still restrictive as members can possibly ignore these and go MIA without any explanation. We believe that in future projects, these should be improved and we have to make sure all the members take accountability seriously.

We have also learned that it is important to have a full understanding on the topic that we are working on. Though there was a basic understanding of the topics in the project, it was not sufficient at the time of starting the project. Thus, this causes delay and blockage in the progress of the project. There were members who did not understand the concept of parallel computing as well as another member. This can be solved by having sharing knowledge on parallel computing before the commencement of the project.

1.7. Evaluation of member's contribution

As the project manager, Christine did an excellent job of planning, administering, and checking the project. She monitored and maintained the project such that each constraint of the project is not outraged. She also allocated the resources wisely so that each member will have a fair workload.

As the project developer, Jack has done a high-grade job of it. He has been concentrating on understanding the code and completed the development which fulfils the requirements. He also managed the resources wisely such that members have a better understanding of algorithms before working on it.

As for quality assurance, ZiSong did a pretty decent job. He verified the quality of each product in the project. He ensured that each product has met the requirements.

2. Minutes of Team Meetings

2.1. Meeting Minutes 1

Meeting Minutes : 2020/03/25

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Meeting Minutes

Meeting no: 1
Date: 25/03/20
Time: 14:00
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker:

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous semester works	I	Christine	N/A	
2	Review previous meeting minutes	I	Zisong	23/10/2019	Discuss about presentation
3	Risk (COVID-19)	A	Jack, Christine and Zisong	25/3/2020	Update the risk register and try to mitigate it by changing the scope (See Appendix A)
4	Development tool setup	A	Jack, Christine and Zisong		Download majorIDEs (Aparrapi, eclipse) and other useful programming tools (github)
5	New schedule to complete project	I	Jack		
6	Next meeting				01/04/2020

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Appendix A

	Risk Register of GPU Acceleration for Raster Filter by using Aparapi				
No.	R1	R2	R3	R4	R5
Rank	1	2	3	4	5
Risk	Changes of Tasks	Deficiency of time	Extension of scope	Few meeting times	Failure of speed up
Description	The inability to meet in person may change tasks to be completed.	The project might not be finished by the deadline.	The project is more qualitative in some parts beyond initially expected.	The time of meeting at campus would be short in holiday.	The Aparapi GPU approaches could not effectively accelerate the raster filter.
Category	Project Management - Tasks	Project Management - Estimates	Technique - Software	Project Management - Communication	Technique – Hardware, Software
Root Cause	Emergence of the COVID-19 pandemic.	Estimation of time by mistake because of insufficient knowledge	Planning of optimize the project	Team members leaving Australia in holiday	Laptop configuration problems or poor understand of Aparapi
Triggers	The need to do social distancing.	Lack of time to finish the project	Add or improve functionalities to project	Could not allocate time for meeting	Low power of laptop or bad use of Aparapi algorithm
Potential Responses	Mitigate	Mitigate	Acceptance	Mitigation	Avoidance
Risk Owner	Jack, Christine, Zisong	Jack and Christine	Zisong	Jack, Christine and Zisong	Jack, Christine and Zisong
Probability	5	3	2	5	1
Impact	5	5	2	3	2
Status					

2.2. Meeting Minutes 2

Meeting Minutes: 2020/04/01

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Meeting Minutes

Meeting no: 2
Date: 01/04/20
Time: 14:00
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I	Jack, Christine and Zisong		
2	Progress report	I	Jack, Christine and Zisong		- Create and connected to Git - Sample Code - Everyone on the same progress
3	Task distribution	A	Jack, Christine and Zisong		4 Tasks : - Read and Write File : Christine - Aparapi Redacted FIle : Jack - Preprocess : Zisong - UI : Everyone Update Microsoft Planner
4	Work Breakdown Structure	A	Christine		Jack: - Development (aparapi algorithm) Christine: - Documentation - Read and Write (I/O) Zisong: - Communicating with Tutor - Code Preprocessing Everyone : - Journal #1 - Interim Presentation - Formal Presentation There might be updates

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					Journal #1 deadline week4 friday
5	Next Meeting	I	Jack		2PM Wednesday 8/4/2020 Agenda : - Previous meeting minutes - Progress report - Task distribution - Priority of tasks
6					
7					
8					
9					
10					

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Details:

Item 3

can use eduard code (Use parts of code but cite it)

UI : use java to create UI, can reuse those part of eduard

aparapi: everyone read eduard code (understand how the code generates mask filter then apply to aparapi)

look at aparapi example code, for more understanding to write algo to code it out

Preprocess stuff : preprocess grid before using it.

create read and write file, and preprocess part by next week.

Microsoft planner changes

Item 4
read n write : before mid sem break
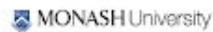
preprocessing : after midsem break

aparapi : week8

use rest of the time for UI

presentation : start from weekr4 or when deets are released

2.3. Meeting Minutes 3

Meeting Minutes: 2020/04/08

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Meeting Minutes

Meeting no: 3
Date: 08/04/20
Time: 14:03
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Christine
Minutes taker: Jack

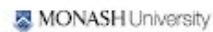| Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I			Work breakdown structure will be created from the proposal (Appendix B), Start Journal on this week
2	Progress report	I			Christine: documentation is done, coding for read and write file, Planner updated, new method for I/O Jack: class diagram, read the grid file, preprocessing method ZiSong: modify Eduard code, investigating the Eduard code
3	Task distribution	A			Refer to the previous Task Distribution Item on previous meeting Mid semester break: presentation - Slide : Jack, Christine, ZiSong - Video editing : Jack, Christine -
4	Priority of Tasks	A			depends on the progress task
5	Provisional Motion: Consultation	I			Refer to details
6	Next Meeting	I			15/4/2020

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Details:

Add ammended Appendix A here (WBS)

Consultation : ask about journal, copying fundamental code (from Oracle : okay or not ? anything has to be changed ?), ask for Eduard : to what extent to integrate with the Eduard code, presentation, interim presentation Week6,

prefered time: Friday 2pm

2.4. Meeting Minutes 4

Meeting Minutes: 2020/04/15

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Meeting Minutes

Meeting no: 4
Date: 15/04/20
Time: 14:03
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Previous Meeting Minutes	I	Christine		First journal completed, work breakdown structure completed
2	Progress Report	I			Christine : - I/O JFileChooser Jack : - Reading the Grid file completed Zisong : - no updates Priorities : - User Interface made if enough time in hand
3	Presentation	A			Specifications were not out yet, assume the previous meeting's task distribution
4	Next Meeting	I			25/04/2020

2.5. Meeting Minutes 5

Meeting Minutes: 2020/04/25

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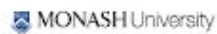
Meeting Minutes

Meeting no: 5
Date: 25/04/20
Time: 13:05
Location: Zoom Meeting
Attendees: Christine, Jack
Absent: Zisong

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I			Work breakdown structure will be created from the proposal (Appendix B), Start Journal on this week
2	Progress report	I			Jack : make aparapi work with the original algorithm. It doesn't work so rollback to the previous state. Christine : JFileChooser for choosing input and output file.
3	Presentation Task Distribution	A			Items Distribution Jack : 3,4,5 Christine : 6,7,8 Zisong : 2,9,10 Unassigned : 1,11,12,13
4	Presentation Timeline	A			25/4 - 27/4 : Presentation 28/4 : Filming 29/4 : Edit & review footage (any changes needed addressed then) 30/4 : Editing 1 / 5 : Submission
5	Next Meeting	I			05/05/2020

2.6. Meeting Minutes 6

Meeting Minutes: 2020/05/05

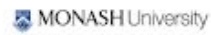MONASH University

Meeting Minutes

Meeting no: 6
Date: 05/05/20
Time: 13:17
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I			Finished presentation video, submitted presentation video
2	Interim presentation debrief.	A			- Repetitions in some parts - Pushing the presentation recording too late
3	Current Progress	I			- Error in read and write out buffer - Needs to be solved before moving onto the next part
4	Next Meeting	I			13/05/20

2.7. Meeting Minutes 7

Meeting Minutes: 2020/05/13
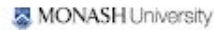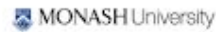
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Meeting Minutes

Meeting no: 7
Date: 13/05/20
Time: 13:05
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I			Jack fixed the error in the project code.
2	Operator Class Distribution	A			Jack: GradientOperator Class Christine: LowPassOperator Class Zisong: ClampToRangeOperator
3	Next Meeting	I			27/05/19

2.8. Meeting Minutes 8

Meeting Minutes: 2020/05/27

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Meeting Minutes

Meeting no: 8
Date: 27/05/20
Time: 14:05
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I			Project distribution done
2	Code Report	A			- Discuss limitations and potential improvements - Basic End User Guide - Technical User Guide - "Script" (info and instructions for installation, configuration, and execution) Commenting and documentation of code : Each members Discuss limitations and potential improvements: Jack Basic User Guide : Zisong Technical User Guide : Christine
3	Test Report	A			- Test for each functionality - using Junit Test framework - what to improve Each members handle their own function
4	Final Report	A			- Introduction - Background : All members 　- Literature Review : review what we used and didn't used; additional material (2000 wods) 　　- APARAPI and parallel computing 　　- Raster filter and its operator 　- summarize relevant and important literature - Methodology : Jack 　- Design 　- method used - Project Management : Christine

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					- how project was managed
					- approach
					- resources, execution n planning
					- risk management
					- limitations
					- Outcome: each member
					  - results / product achieved
					  - requirements met
					  - critical reasoning (must be
					    applied on all sections)
					- Conclusion
					- References
					- Appendix
					  - Meeting minutes
					  - risk register
					  - risk matrix
					  - WBS
					    - project / code
					    - code report
					    - test report
					    - final report
					  - microsoft planner

5	Project Presentation	A			- Conclude the Final Report within 10 mins - TBD - Online meeting vs Video presentation - choose Online meeting
6	Final Journal	A			each team member has to deal with it
7	Next Meeting	I			03/03/2020

2.9. Meeting Minutes 9

Meeting Minutes: 2020/06/03

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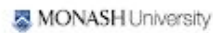
Meeting Minutes

Meeting no: 9
Date: 03/06/20
Time: 14:35
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I			Project complete, discussing final report and task distribution
2	Code Report	A			Progress: Basic User Guide : Is done, add screenshots Technical User Guide : Is done, add screenshots In-Comment Code
3	Test Report	A			Notes when writing this section: - Need help on limitations of software description - Improvement : changing to new technology, Aparapi can't solve this limitation - HorizontalTransposing of the Eduard, operator is actually private class of abstract frequency operator class, we can't check directly, but still can check the output - exclude getter setter methods - usability test : further elaborate

4	Final Report	A			- meeting minutes, just a bit, not all
					
					- Literature Review
					  - 1500 words, around 2-3pages
					  - use the same resources but do not copy
					    may use in-text citations

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					outcomes:
					- related to our scope, succeeded and failed at the same time, further elaborate, aparapi can't accept several chunk, threaded algorithm used instead - 1st trade off : lowpass operator can't access previous rows, therefore we use for loop - 2nd trade off : copy array from CPU to GPU and vice versa - 3rd trade off : translate Eduard Grid to Aparapi Grid and vice versa
5	Project Presentation	A			Zoom meetings, presenting the final report, don't have to finish the report yet. avoid repeating yourself or among the members, make sure everyone is saying something different. mention things that are very important.
6	Team Management Report	A			- like journal entry but as a group thing. Limitations : 1.5 pages - 2 pages - meeting minutes, all in team management Report,
7	Final Journal	A			each team member has to deal with it
8	Next Meeting	I			09/06/2020

2.10. Meeting Minutes 10

Meeting Minutes: 2020/06/09

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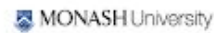
Meeting Minutes

Meeting no:　10
Date:　09/06/20
Time:　13:25
Location: Zoom Meeting
Attendees: Christine, Jack, Zisong
Absent: -

Chairperson: Jack
Minutes taker: Christine

Item No.	Item	Info (I) or Action Item (A)	Person in charge (PIC)	Due date	Comments
1	Review previous meeting minutes	I	Jack, Christine and Zisong		Code Report and Test Report completed. Moderate progress on the Final Report and Team Management Report
2	Progress report	I	Jack, Christine and Zisong		- finalizing each report - code cleaning done
3	Presentation debrief	A	Christine		Presentation slides, member's presentation review, what to improve.
4	Report reviews	A	Christine		Review each section on the report

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Details:

Item 3 Presentation debrief

- Presentation slides
  - Good layout : get templates themes
  - Minimize the words in the slides
- Presentation Content
  - Flow is good
  - Question related to the
- Presentation Time
  - Overtime : rehearse being timed. Changes content depending on timing.
  - Familiarize with content : easier to manage time
  - Time management : use time efficiently for presentation rehearsals