

Project Updates: Master Record

Sidharth Shanmugam

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Introduction

This master record collates weekly project updates to produce a thorough insight into progress within a single document. Each section consists of a week's update. Within each section are the following subsections and descriptions:

- **Supervision Meetings:**

Consists of a listing in table format of the supervision meetings that have occurred since the last update, including dates, attendees, and a brief description of discussions and actionable items.

- **Actionable Items Recap:**

Consists of a listing in table format of the actionable items from the previous week, briefly discussing the progress made and pending tasks.

- **Additional Project Updates:**

Consists of updates that weren't 'actionable items' from the previous week, such as brief overviews of experiments conducted, data collected, and research findings.

- **Next Week's Agenda:**

Consists of a listing in table format of the actionable items to complete before the next weekly update, including task descriptions, rough timelines, and success metrics.

- **Comments & Concerns:**

Consists of a brief analysis of comments or observations about other aspects of the project, such as facilities, work environment, and any outside interest in the project. Furthermore, outlines any concerns about the project.

1 03-11-2023

1.1 Supervision Meetings

| Date | Agenda | Actionable Items | Attendees |
|------------|--|--|--|
| 31/10/2023 | <ul style="list-style-type: none">• Pinpointing project scope/objectives.• Laying out rough schedule based on project objectives.• Getting started on pre-reading/literature review.• Discussing organisational tips/workflows.• Schedule for re-occurring meetings. | <ul style="list-style-type: none">• Next meeting in person to see existing lighting system. After seeing the existing system, I can decide the avenue I'd like to pursue.• Carry out some rough preliminary research for the 4 potential objectives: improving real-time computing, underwater testing, backscatter depth perception, ML-based backscatter position tracking. | <ul style="list-style-type: none">• Sidharth Shanmugam• Paul Mitchell• Benjamin Henson |

1.2 Actionable Items Recap

| Actionable Item | Progress Report | Pending Tasks |
|-----------------|-----------------|---------------|
|-----------------|-----------------|---------------|

No actionable points from the last weekly update.

1.3 Additional Project Updates

| Additional Update | Description |
|-------------------------|--|
| Created project journal | <ul style="list-style-type: none">• Created project-journal GitHub repository.• Consisting of Word doc outlining entire project progress. |

1.4 Next Week's Agenda

| Actionable Item | Description | Success Metrics | Target |
|--------------------------|--|--|----------|
| Preliminary research | <ul style="list-style-type: none"> • Read about each of the 4 objectives, make notes on the technical aspects that would be required for each in project journal. | <ul style="list-style-type: none"> • Make notes in project journal, discuss during the next supervision meeting. | Thursday |
| Next supervision meeting | <ul style="list-style-type: none"> • Next supervision meeting to take place on Thurs 9th Nov @ 2pm at the ISA (Paul Mitchell to send calendar invite). • As discussed in the last virtual supervision meeting, after seeing the lighting system it'll be easier to decide which avenue I want to re-search. • Since the next meeting is at the ISA I may get a tour of the facilities. I can learn about the tools I'll have at my disposal for this project. | <ul style="list-style-type: none"> • Not very easy to generate measurable success metrics for these items. • Decide on one of the 4 objectives. • Make notes on useful facilities for this project at the ISA in project journal. | Friday |

1.5 Comments & Concerns

No comments or concerns at the moment.

2 10-11-2023

2.1 Supervision Meetings

| Date | Agenda | Actionable Items | Attendees |
|------------|---|--|--|
| 09-11-2023 | <ul style="list-style-type: none">• Discussed real-time software research findings.• Tour of the ISA, desk assignment.• Meetings to happen bi-weekly in person until next semester. Will be in touch with Paul & Ben with any project updates.• Discussion about hypervisors with Ben. Using Docker to package script and assign CPU/hardware, potentially solving OS scheduling issues.• I've shown interest in the 'improving real-time computing' aspects of the project. May have some aspects of underwater testing using facilities.• Rewriting software in C to reduce the overheads introduced by Python.• Paul & Ben mentioned to start simple with the software logic - with simple thresholding - then fine tuning to improve accuracy.• Ben mentioned to read older literature (e.g. 2010-era) on digital image processing - since there won't be any added complexities such as computational intelligence/ML/AI.• Work can be done to research the performance of different algorithms to detect and eliminate backscatter. | <ul style="list-style-type: none">• Ben will send me some underwater footage to help me test any code without needing to implement in hardware and physically test.• I will ask Ben to send me the existing Python code so that I can get it set up on my Raspberry Pi.• With some underwater footage, I can modify the existing Python code to stream the video from file instead of from a camera, I can try to experiment with hypervisors (Docker) to see differences in performance. If there is an improvement, I will implement Docker in my final code.• I will try to research digital image processing from <i>older</i> literature.• I will try experiment with running C programs on Raspberry Pi. | <ul style="list-style-type: none">• Sidharth Shanmugam• Paul Mitchell• Benjamin Henson |

2.2 Actionable Items Recap

| Actionable Item | Progress Report | Pending Tasks |
|--|--|--|
| <ul style="list-style-type: none">• Next meeting in person to see existing lighting system. After seeing the existing system, I can decide the avenue I'd like to pursue. | <ul style="list-style-type: none">• I have shown interest to delve into the 'improving real-time computing' avenue.• I have seen the existing lighting system, and have received a tour of the ISA. | <ul style="list-style-type: none">• <i>No pending tasks.</i> |
| <ul style="list-style-type: none">• Carry out some rough preliminary research for the 4 potential objectives: improving real-time computing, underwater testing, backscatter depth perception, ML-based backscatter position tracking. | <ul style="list-style-type: none">• Initial research into 'improving real-time computing' has been conducted with some reading into real-time software (documented in the Project Journal).• I have not conducted any research on the other 3 objectives since those avenues would probably not be pursued.• Underwater testing aspects may need to be researched, however, not any time soon. | <ul style="list-style-type: none">• <i>No pending tasks.</i> |

2.3 Additional Project Updates

| Additional Update | Description |
|-------------------------------|-------------|
| <i>No additional updates.</i> | - |

2.4 Next Week's Agenda

| Actionable Item | Description | Success Metrics | Target |
|---|--|---|--------|
| Experiment with hypervisors | <ul style="list-style-type: none"> • Get existing Python code and some underwater GoPro footage from Ben. • Modify the existing Python code to stream the video from file instead of from a camera. • Package the software with Docker, measure performance differences. | <ul style="list-style-type: none"> • Modified code should be working and containerised with Docker. • Make notes in project journal, discuss during the next supervision meeting. | Friday |
| Gather some digital image processing literature | <ul style="list-style-type: none"> • Since this is quite early on and I have other modules to focus on this semester, I won't be going into too much depth with the literature. • So this actionable item would be to simply gather a list of potential pieces of literature that I could read in depth at a later date. • I should be making some brief notes on the contents. | <ul style="list-style-type: none"> • Log the brief notes in the Project Journal, citing the sources of the literature. | Friday |
| Experiment with RPi and C programming | <ul style="list-style-type: none"> • Make simple scripts in C and run on Raspberry Pi. • Set up a simple-yet-efficient workflow that can speed up development time in preparation for when I start writing the project software. | <ul style="list-style-type: none"> • Log progress in the Project Journal, maybe even store code in a 'spike' repository on Github. | Friday |

2.5 Comments & Concerns

No comments or concerns at the moment.

3 27-10-2023

3.1 Supervision Meetings

| Date | Agenda | Actionable Items | Attendees |
|-----------------------|---|---|--|
| 31/10/2023 (upcoming) | <ul style="list-style-type: none">• Pinpointing project scope/objectives.• Laying out rough schedule based on project objectives.• Getting started on pre-reading/literature review.• Discussing organisational tips/workflows.• Schedule for re-occurring meetings.• (more to be added if I can think of anything else important) | <ul style="list-style-type: none">• N/A | <ul style="list-style-type: none">• Sidharth Shanmugam• Paul Mitchell• Benjamin Henson |

3.2 Actionable Items Recap

| Actionable Item | Progress Report | Pending Tasks |
|---|---|--|
| <ul style="list-style-type: none">• Actionable item 1 | <ul style="list-style-type: none">• Progress report 1• Progress report 2• Progress report 3 | <ul style="list-style-type: none">• Pending task 1• Pending task 2• Pending task 3 |
| <ul style="list-style-type: none">• Actionable item 2 | <ul style="list-style-type: none">• Progress report 1• Progress report 2• Progress report 3 | <ul style="list-style-type: none">• Pending task 1• Pending task 2• Pending task 3 |

Since this is the first weekly report and supervision meetings haven't previously taken place, there are no actionable items to reflect on. Therefore, a boilerplate table is provided above to outline the structure for future weeks.

3.3 Additional Project Updates

| Additional Update | Description |
|-----------------------------------|--|
| Created weekly updates automation | <ul style="list-style-type: none">• Created weekly-updates GitHub repository.• Branch contains templates which I update each week.• Jenkins CI/CD to pull the templates, compile LaTeX to generate PDFs.• PDFs then downloaded and emailed accordingly. |

Since this is the first weekly report and work on this project hasn't commenced yet, there are no additional updates to reflect on.

3.4 Next Week's Agenda

| Actionable Item | Description | Success Metrics | Target |
|-------------------|---|---|-----------|
| Actionable item 1 | <ul style="list-style-type: none">• Description point 1• Description point 2• Description point 3 | <ul style="list-style-type: none">• Success metrics 1• Success metrics 2• Success metrics 3 | Thursday |
| Actionable item 2 | <ul style="list-style-type: none">• Description point 1• Description point 2• Description point 3 | <ul style="list-style-type: none">• Success metrics 1• Success metrics 2• Success metrics 3 | Wednesday |

The future week's agenda will be discussed in the upcoming supervision meeting. Above is a boilerplate table to outline the structure for future weeks.

3.5 Comments & Concerns

No comments or concerns at the moment.