

**QUEEN'S UNIVERSITY OF BELFAST
COMPUTER SCIENCE**

Minute of Project Supervision Meeting

Student Name:	Adam McKenna		
Project Module Code:	CSC4006		
Project Supervisor:	Prof. Sandhya Dubey		
Meeting Number:	1	Date of Meeting:	12 th October 2020

Progress since last meeting, and decisions arrived at during meeting:

- Initial introductory kick-off meeting.
- Introduction to the general area that Masters will be focused on; bioinformatics.
- Discussion on general areas of interest that I have and suggestions to the main project.
- Discussion on the objectives of the project and the timeline moving forward.
- Discussion on the general outline and process for the module's specific requirements and expectations of the Masters.

Action Points:

- Read over some of the papers provided and try and understand them.
- Think over and narrow down the specific area that I would like to focus on.

Date of next meeting:

26th October (2 weeks time)

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna **Date:** 27-10-20

Supervisor's Initials: SD **Date:** 27-10-20

Supervisor's Comments:

- Read over the provided papers and try to understand the methodology and what is trying to be achieved in them.

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Minute of Project Supervision Meeting

Meeting Number:	2	Date of Meeting:	28th October 2020
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Progress since last meeting, and decisions arrived at during meeting:

- Clarifying Objective of the master's project – understanding the function and chemical interactions of a protein based on the electrostatic interaction between amino acid residues.
- Discussed example papers to read over, including patent literature.
- Discussed different approaches for achieving objective, mainly through digital signal processing or neural networks.
- Discussed the general timeline for the next 4 weeks prior to the preliminary report deadline.
- Discussed potential datasets and what kind of features to use within the machine learning model.
- Talked about the different channels available to myself for support throughout the project, including email and WhatsApp.

Action Points:

- Read over papers sent over by supervisor.
- Attempt to implement the papers computationally in a Python notebook to try and understand the authors approach that will help me on my own technique to realize the problem at hand.
- Continue reading up on the general area being researched, ensure that I have a concrete understanding of the foundation and background of the topic and its relevant components.
- Make a start to the upcoming preliminary report deadline in a month's time.

Date of next meeting:

11th November 2020 (2 week's time)

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna **Date:** 12-11-20

Supervisor's Initials: SD **Date:** 12-11-20

Supervisor's Comments:

- Try to implement the methodology of the paper computationally and if any issues or problems then reach out to supervisor using provided contact details.

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Minute of Project Supervision Meeting

Meeting Number:	3	Date of Meeting:	13th November 2020
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Progress since last meeting, and decisions arrived at during meeting:

- Discussion of specific title and objective of project. What specific organisms or proteins to use - HIV or Influenza, maybe Covid related.
- What physiological characteristics/features to use from the AAIndex? These characteristics will be captured from proteins and their spectra compared using DSP techniques. Talked about a hybrid approach, using multiple characteristics.
- Discussion of the history of the problem - different techniques that have been used in the past.
- Beyond DSP, ML techniques such as NN/CNN were proposed.
- Discussion of upcoming draft/preliminary article deadline and what to include/exclude.
- Discussion on the biological inference from the output of the DSP and what is the biological significance of the output spectra.

Action Points:

- Continue progressing using DSP to compare protein's physiological characteristics but start to investigate ML approaches which could be used in addition.
- Read over some of the papers to try and establish what features have been most successful and think about a hybrid of the best features.
- Research into different protein sequences that could be used for comparison, look through sequences in protein database such as UniprotDB.
- Continue writing draft and send to supervisor within the next week or so.
- Supervisor will clarify some of my pending questions and get back to me next week.
- Questions raised including what a NN approach would look like & what is the specific biological

Date of next meeting:

27th November 2020 (2 week's time)

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna **Date:** 14-11-20

Supervisor's Initials: SD **Date:** 14-11-20

Supervisor's Comments:

- Continue working on the draft for the upcoming deadline, forward any questions or queries to supervisor.

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Minute of Project Supervision Meeting

Meeting Number:	4	Date of Meeting:	26 th November 2020
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Progress since last meeting, and decisions arrived at during meeting:

- Discussed some further feedback and amendments required for the draft due tomorrow.
- Discussed some of the code that has been created for the project.
- Had another review of the general topic/objective for the project to further my understanding.
- Discussion of the features, input, and output to the system to be developed.
- Types of protein/virus sequences to be used.
- What physiochemical/biological characteristics/properties to be used.
- Approaches to make system extensible and versatile so it can use different proteins from different families.

Action Points:

- Make small changes to draft document mentioned.
- Tidy up code.
- Look up papers that have focused on HIV virus and how they have solved the problem and what approach taken. Try to replicate, using similar datasets, and then extend to Covid or other similar viruses.
- Start with a DSP approach, then ML, compare both of these approaches, and if time at end combine both and compare.

Date of next meeting:

Early Jan (after Christmas break)

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna Date: 27-11-20

Supervisor's Initials: SD Date: 27-11-20

Supervisor's Comments:

- Finish draft paper and software demo code due for 27th Nov.

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Minute of Project Supervision Meeting

Meeting Number:	5	Date of Meeting:	8 th January 2021
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Progress since last meeting, and decisions arrived at during meeting:

- A catch-up from the Christmas break, talking about the small progress made and about any upcoming deadlines in general for semester 2 and deadlines specific for project.
- Some other questions were answered on some more project specifics.

Action Points:

- Start getting back to the project, now the holidays have ended.

Date of next meeting:

22 January (2 week's time)

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna Date: 9-01-21

Supervisor's Initials: SD Date: 9-01-21

Supervisor's Comments:

- No additional comments.

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Minute of Project Supervision Meeting

Meeting Number:	6	Date of Meeting:	29 th January 2021
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Progress since last meeting, and decisions arrived at during meeting:

- Small progress made since the previous meeting; other January deadlines have taken recent precedence.
- Verifying that a few papers I've found online are relevant to the topic at hand.
- Small update on code and directory structure.

Action Points:

- Focus on next steps in project once the last deadline at the end of the month is over.
- Review code pipeline and directory structure.

Date of next meeting:

19th February (3 weeks time)

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna Date: 30-01-21

Supervisor's Initials: SD Date: 30-01-21

Supervisor's Comments:

- No additional comments.

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Minute of Project Supervision Meeting

Meeting Number:	7	Date of Meeting:	20 th February 2021.
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Progress since last meeting, and decisions arrived at during meeting:

- Progress on paper and code. Outlined general structure of paper including section headings and their contents.
- Outlined update made to the code including new classes, functions and scripts included or updated and received some feedback on them.
- Reviewing some preliminary results gotten so far, what they mean and what they imply.
- Discussion on other upcoming assignment deadlines.

Action Points:

- Act on feedback received about the code thus far.
- Have another look over the results, double check I am processing them correctly to get the right results.
- Review some of the literature to infer the meaning of these results.

Date of next meeting:

6th March

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna Date: 21-02-21

Supervisor's Initials: SD Date: 21-02-21

Supervisor's Comments:

- Investigate the meaning behind some of the results so far.
- Double check some of the headings and the structure of the paper, read over some of the provided and similar papers to see what structure has been used there.

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Minute of Project Supervision Meeting

Meeting Number:	8	Date of Meeting:	15th March 2021
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Progress since last meeting, and decisions arrived at during meeting:

- Mini-demo of the code notebook I've been working on, full run through of the general functionality of the system thus far, comments received and noted.
- Showcased the paper thus far, highlighting the headings I've collated the paper into, and the sections still left to start and write up.
- Further discussion on my realistic expectations of project now a little more than a month remaining, concluding maybe I need to talk a step back and think about expectations.
- Paper emailed to supervisor.

Action Points:

- Format code and make available on GitHub.
- Similarly, upload the datasets and preliminary results to GitHub.
- Translate code from Collab notebook into a directory and repository.
- Double check format of paper, including ensuring it's in the IEEE format and the text is justified etc.

Date of next meeting:

29th March

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna **Date:** 16-03-21

Supervisor's Initials: SD **Date:** 16-03-21

Supervisor's Comments:

- Ensure paper is in the correct format and follows the template provided.
- Continue working on the code and software's functionality.

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Minute of Project Supervision Meeting

Meeting Number:	9	Date of Meeting:	27th March 2021
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Progress since last meeting, and decisions arrived at during meeting:

- Breaking down expectations and re-evaluating the general quantity of work I'm doing. Concluded to focus experimenting the methodology on one dataset rather than four currently.
- Further update on results produced, most results acquired so far, and the results still left to obtain.
- Discussion on the possible name of the software, a low-priority item that is TBC.
- Outlining priorities and what things need to take precedence, identifying what tasks should be a high priority and others a low-priority.
- Discussion on the general roadmap for the last busy month left in the project.
- Discussion on documentation for the software being created.

Action Points:

- Reformat paper such that I am focusing on results for just the one dataset. Read over and remove non-essential paragraphs and references, considering that I am over the page and reference limit currently.
- Make a good start to the software dev report, attempt to get a draft for Wednesday.
- Think about documentation for the software, what are the essential things to include?
- Think over the name of the software again – low priority.
- Think about demo and presentation – what are the important points to include and what exactly do I want to showcase in the demo?
- Commit and push more code to the GitHub by mid-week.

Date of next meeting:

12th April

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: *AMckenna* **Date:** 28-03-21

Supervisor's Initials: SD **Date:** 28-03-21

Supervisor's Comments:

- Prioritise what tasks need to be achieved in the time remaining.
- Make a start to the software dev report and documenting code.
- Continue writing paper, ensuring it is in the correct IEEE format.

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Minute of Project Supervision Meeting

Meeting Number:	10	Date of Meeting:	19th April 2021
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Progress since last meeting, and decisions arrived at during meeting:

- Discussion on an approved 2 week extension, thus extending the deadline from 23rd April to 7th May.
- Readjusting some expectations and whether than can be met now that I have an extension. It is still vital to prioritize certain tasks ensuring the most important requirements of the software are met.
- Discussion on software name, it was decided that pySAR was the most appropriate and intuitive name.
- Discussion on a logo for the software, a low priority item but still worth considering and thinking about.
- Verification on some of the contents of the paper thus far, is what I am discussing relevant and appropriate to the problem and topic? Read over the paper again to confirm this.
- Discussion on results so far and what results need to still be produced and the barriers holding me back from getting the remaining results, mainly software bugs.
- Discussion on publication of the paper to the IEEE access journal. Read into the format desired for this journal and double check paper is following all of the standards/requirements.

Action Points:

- Complete final preparations for new deadline in ~2 week's time, including rereading the paper ensuring that the key points are being discussed. Also, double check the paper is in the correct format, including the tables and figures and proofread to check for any grammatical and or spelling mistakes.
- Continue to fix any bugs or errors that are halting getting the final results and thus halting the finalizing of the paper.
- Aim to generate the remaining results asap and talk about them in the paper. Push results files to repository.
- Get a final draft of the paper to supervisor by end of next week.
- Get a preliminary draft of software report to supervisor by end of next week.

Date of next meeting:

5th May

Agreed minute should be signed by the student and initialled by the supervisor.

Student's Signature: AMckenna **Date:** 28-03-21

Supervisor's Initials: SD **Date:** 28-03-21

Supervisor's Comments:

- Continue working on all three main tasks, priorities finalising the paper and get a draft to supervisor by end of next week.
- Ensure paper follows format and standards.
- Ensure code and software is well-documented and easy-to-follow and understand.