Hand notes FYP

Diary of the final year project

Antonio Ramon Oliver (Student)

FINAL YEAR PROJECT IDEAS (FYP)

SD1 → Pytha
Computer Systems
~~Maths for computer Science~~
~~SD2~~ → C/C++
Computing and Society
~~Database~~ → My SQL/PhPMyAdmin

~~SD3 → C#~~
~~Operating Systems~~
Algorithms
~~Software Engineering (Web)~~
Data Science
AI

~~Data Visualisation~~
ML
Data Engineering
Cyber - Security
FYP

Project types → Student / Academic (Research) / Industry / Social entapise
defined defined defined

~~University ideas (Teachers + YOUR web)~~
~~+ Web scraping → #4 (Next project)~~
~~+ Tool for ordering emails #2~~
~~+ Collect, analyse and visualize data → #1~~
~~Networking~~
~~Data analysis/visualisation~~
AI and ML
~~Cyber Security~~
~~Cloud computing~~
~~Backend Dev (Web)~~
~~Games~~
~~Mobile apps~~
~~Full Stack Dev (Web)~~
~~Frontend Dev (Web)~~

Online ideas (Youtube + Web search)
→ ~~Web scraping with Beautiful Soup (Next project)~~
~~+ Sentiment analysis (NL + NLP)~~
~~+ Chat bot (AI, Spacy for NLP on Chat-bot (NL)).~~
+ ~~Spam filter (SVM Filtering (AI & Trad ML))~~
+ Live chat room + AI moderator (websocketing + servers communication)
~~+ Fraud recognition software (Open CV (computer vision))~~
+ ~~Solitaire player with AI~~
+ ~~Gender and age detection system (Python + Sport Vector Machine + CNN)~~
+ ~~Customer segmentation (Python + Kmeans clust)~~
+ ~~News classification (NLP)~~
+ Control volume based on gesture to camera (MediaPipe, Open CV, Pycaw, TF...)
+ ~~Smart doorbell (Raspberry Pi)~~
+ Image classification by deep learning
+ Face recognition + tracking system (automatic detection, computer vision, Open CV)

My OWN ideas
+ Dating automation → click automation, Chat Bot (AI, Spacy for NLP on Chat-bot (NL)), Image recognition of woman
+ Analyse business report and give recommendations: buy stocks, give credit, buy obligations. Smart-money analysis (NL + NLP)
+ Music creation / mixer
+ ~~Something about networks: WiFi, Routers...~~

1. ~~Dating automation (with extra features)~~
2. Music creation / mixer
3. Analyse text/business report and recommend
4. ____

Decision FYP (before 17 October 2022).
Music creator with some features like image or gesture recognition
Business analysis from text

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List of possible projects before take decision:

1. Web browsing automation / web scraping (BeautifulSup) (Client Project). Add < chat bot / Image recognition
2. Gender and age detection system (Support Vector Machine and CNN)
3. Volume control based on gesture to camera (MediaPipe, OpenCV, OpenCaw, TF, etc) — One project
4. Image classification by deep learning
5. Face recognition + tracking (computer vision, OpenCV) — One project
6. Smart doorbell (Raspberi Pi)
7. Sentimen analysis for business report + recomendations for business analysed.
8. Music creation / mixer.

(1)
(2+5) → Computer vision for face, gender and age recognition and tracking system.
(3)
(4+6) → Image classification live (computer vision)? (API)?
(7)
(8)
add extra feature
(1), (3), (7), (8), (2+5+7+6) → Image classification and recognition with tracking

~~(1)~~ → ~~Web scraping~~
~~(2+5+7+6)~~ → ~~Image classification + recognition~~ + tracking.
(3,8) → Mixer + computer vision.
(7) → Sentimet analysis.

(1), (3,8), (7), (2 5 4 6)
very like ← → very hate

(3,8) Winner → (Music creator) + computer vision to recognise movements (maybe face to produce different music for each customer).

(7) → Business report analysis (if (3,8) not accepted).

Some ideas from previous page:
+ Gender and age detection system
+ Control volume based on gestus to camera
+ Image classification by deep learning / Image recognition
+ Face recognition + tracking system (automatic detection)

AI and ML field in CS

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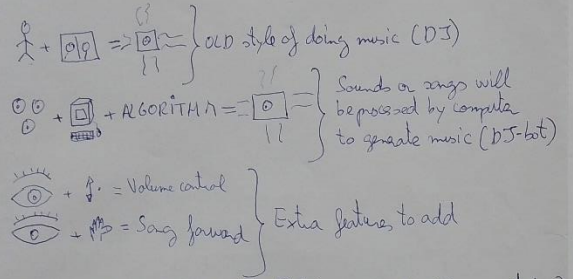
PROJECT PROPOSAL: SOUND/MUSIC.



+ Initial and obvious problem → data ? (Songs, sounds, files, created...)
+ Algorithm to mix/create music → TF, NN, Numpy, RNN, Keras (TF), Pydub, Librosa, magenta, Flow Machines,

Music composita title → "DJ Pyonear Neterlan"

Reasons of developing/creating my project (DJ Pyonear Neterlan):

1. Increase creativity of real life musicians / producers.
2. Reduce time and effort of create new music.
3. New style of music (discovery)
4. Access to DJ at any time and at any place
5. Reduce equipment to create and mix music/mots (single computer)
6. Artistic practice. Freedom of expression/experimentation...
7. AI, ML, Data is used with Python (related to computer science).
8. Selling good songs online, real-life, movies, games, etc. (€, $)
9. Study of sound waves is possible (knowledge, time).

Existence of similar projects:

Music players, music recorders
Music streamings and music monetization
Sounds generated by computers
} & Sound (music)

Image recognition, image classification
Text analyze (sentiment analysis)
Self driving cars (decision making)
} & AI | ML | Data Science

"DJ Pyonear Neterlan"

Idea: sounds and songs mixed by algorithm (ML) to produce new song better one. Like cook a cake: ingredients + + oven and time = delicious cake.

Manage sound and next song with a stick in front of the camera (if time allows!).

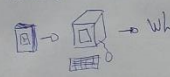
Topics of music creation:

reinforcement-learning, unsupervised learning, markov-chain, ML, TF, networks, LSTM, mm-pytorch, deep-learning, RNN, deep reinforcement learning, magenta, maestro, neural network, generative--adversarial network, AI, wavegan, polyphonic, nlp, emotion, keras, use, pitch ...

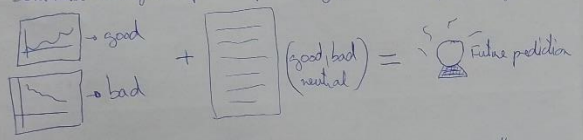
Candidates to Supervisor and 2nd marker:
Ximia Allsi, Wei Li, Xuanlin Gu, Peleni Apantaku.

PROJECT PROPOSAL : TEXT.

Title → "BAB" (Business Administration Bot).

 → What to do? (Buy, Sell, Hold, NIA).

Sentiment analysis + pictures processing (charts) to predict future.



Text analyzer title → "BAB (Business Administration Bot)".

Reasons of developing this project :

1. Online reports (save paper)
2. Save time to read and accessible to everyone (not economic)
3. Cold decision without human feelings (intelligent decision)
4. Detect hidden expressions in the text.
5. Any language possible (no necessity of English needed).
6.

Folder organisation (after decided with songs)

ERK
- model.h5
- performance pictures
- music output → 10 files as example

CHINA
- model ML.h5
- model DL.h5
- performance pictures < ML / DL
- music output < 10 files with model ML / 10 files with model DL

DL with 2 hidden layers

PIANO
- model DL.h5
- performance pictures
- 10 songs

} DL with 3, 4 or 5 hidden layers

Decide model after all these 4 are created, analysed and exploitet.

Ask supervisa for recommendation.

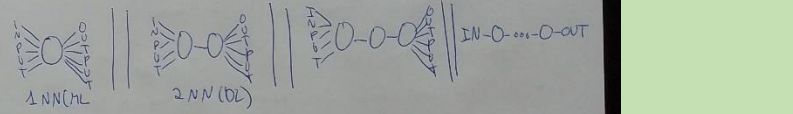
Do training on Colab because on my computer erk (ML) takes 1 day.

Notes: christmas holidays and beginning term 2 (before midterm)

Monophonic songs → 1 instrument
Harmonized songs → 2 or mae notes at same time (maybe 4 instruments) and chords
String quartets → 2 violins + 1 viola + 1 cello (4 people playing music). Too long and too complex.
Piano sonatas → solo instrument (no vocals and basic musical form).
↳ 1 instrument like piano, violin, etc.
Other keyboard music
Miscellaneous → similar to monofonic (have a look at last 2 points)

LSTM network unit structure → YouTube
GRU model (better than LSTM)

NN architecture:



It is possible to create own performance measurement

Surveys file format → mp3, wma, wav, mpeg and others
↳ mp4, mov, flv, avi and others

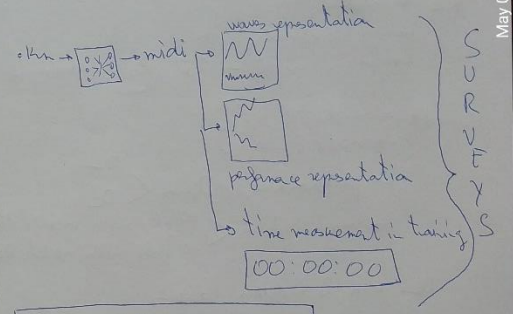
Midi2lum.exe → Do Not work (C++) because of faulty headers
files converte for my own music from Internet.

FIXIN FYP AFTER CHRISTMAS BREAK:

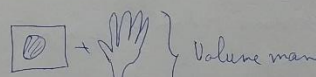
"DJ Pyonear Neterlan"

Features in my project:

- krn data and translation to midi.
- volume management
- training performance measurement by graphics
- different qualities of output based on initial data (input)
- survey / feedback online by listening
- sound representation graphically
- program plays music with python
- translation from midi to < mp3 / wav → surveys upload files
- do ML and DL for same data and compare



krn → midi → mp3 / wav



2 data types in .krn
1 mix of all in krn

5 models:
2 < single (ML) / double (DL)
1 mix with many layers (DL)

Do erk < ML / DL
Do all — DL extra layers
Piano < ML / DL

5 models.

Monophonic songs < erk — ML ① / China (all files) < ML ② / DL ③ ④ (2 / 3 Hidden layers)
Piano sonatas < ~~ML~~ DL ⑤ → 3, 4 or 5 Hidden layers
Harmonized and miscellaneous (2 last points) → maybe

5 models !!!!!

ERK → ML (as Kantuki) ①
China → ML ② / DL ③
Piano → DL < ④ ⑤

ERK → ML → ①
CHINA → ML → ② / DL → ③
PIANO → DL → ⑤
+ Decide one more model.

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FINAL-YEAR PROJECT

Sept. 2022 - ~~Jun~~ MAY 2023

* Individual work supported by member of academic team (supervisor)

29 September 2022 to 08 December 2022
Dr. Clarke Charles, DB ~~252~~ 210, Wednesdays 3-5 pm

+

Dr. Clarke Charles, DB228, Fridays 10am-12am
23 January 2023 to 27 March 2023

Dr. Li } Work references
Dr. Gu } Postgraduate references

Thursday, 29 Sept. 2023

Week - 1

Individual project. Own work.

40 credits → 600 hours (10 hours a week)

Problem based all the project.

5 may 2023 last week (week 24). Start week 1 (26 Sept.)

Project managnet → Trello a another. Invite manage.

Teamwall ? Choseare.

Repo = 10.000 words.

Project is good for CV. Software Eng. is good a well for CV/work.

7 Milestone: Find project, select supervisor, demstrate project in January 2023, 2 week pre-submissia (feedback will help project. will help), in may mark will be visible.

Use template for submit the project.

After class, at home:

Produce an artefact + reporting report. It will be supervised by an academic. Delivery → 05 May 2023, 100% weight (use Moodle).

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Objectives:

+ Self-manage individual work (use project management techniques)
+ Define a quality solution to a problem (use ideas, practices ...)
+ Apply skills from CS programme.
+ Project should meet real needs in a wider context.
+ Critical self-evaluation of the project process.
+ Recognise legal, social, ethical and professional issues in the project.
+ Produce report that describes and summarises the project process, including evaluation.

Assessment:

See PDF (Grading criteria, Excellent).

Use Impatant Milestones (section Milestone 04).

+ BSc Project Marking Criteria:

+ Attend all meetings and took gradually the lead in the meeting.
+ Keep documented the meetings and the agreed outcomes of all meetings.
+ Develop a plan, monitor it and adapt it in charge in scope and requirements.
+ Understand and solve a real problem with investigation and previous experience.
+ Expand and investigate around the problem area. Review literature and technology.
+ Clearly understanding principles of the problem and clearly solve the problem.
+ Learn something new. Compare initial, final and other works against my one.
+ Think about alternative approaches to solve the problem. Use advice, and backtrack.
+ Meet the original aims of the project with high quality level.
+ Face issues in the lifecycle of the project. Describe future work related to the project.
+ Understand legal issues, social issues, ethical and professional aspect of the project and write it into the report.

+ BSc Categorical Marking Framework:

Last point to read online

U6 assessments →	100	Upper First:	First work:	2:1 work:	2:2	3rd:
	The best!	92, 85, 82	78, 75, 72	68, 65, 62	58 55 52	48 45 42

See marking rubric.

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Familiarise with Cite them right system → see videos / lessons.

Useful Project Resources and Information:

Wad template → BSc FYP_v03 → 13 pags with helpful instructions.

Overview → independent work to demstrate skills in the area. The artefact addresses a particular problem. 40 credits (+/- 600 hours of study). Demstrate abilities and pursue my academic interest. Use knowledge from degree plus make research. Adquire new practice and expertise.

1. Select project topic of interest to pursue.
2. Manage productivity of the whole project. Time management, organisation and motivation.
3. Develop a plan to deliver my project. If plan evolve with the project, return to the plan and update it. Planing is better than sticking to a plan.
4. Critically evaluate my work, other solutions to solve the problem, produce a good artefact and demonstrate awareness of the context of my work (published work, technology alternatives).

Learning outcomes → these are the 7 objectives of the back of the previous page (7 + on top of the page).

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Selecting a project → selecting a project is the first big task.

There are four types of poject:

* Academic defined: the most common, the project is defined by academic team. There are 2 types:
  - Research: me work with academic. Do investigation and research. Good for academic canon.
  - Build: project ideas from academics. Not research 100%.

  The academic involved will typically be my project supervisor.
* Industry defined: industry/commercial sector. The industry contact is the stakeholder of my project but they cannot be a member of the supervisory team.
* Self defined: own ideas to motivate myself. Very common and an academic ensure that it is suitable style and scope.
* Social enterprise: aimed at social good over specific commercial goals. Looks like self defined or industry defined project. This will drive the evaluation to assess how well my project has met its aims in the context of project societal issues.

Valid project: is the one aproved by academic team, to ensure:

- appropiate scope for BSc.
- meets the professional body standards.
- meets the requirements of the programme.

→ Supported by the supervisor, programm convenor.

British Computer Science Project Requirements: read online text. BCS and Chartered Institute for IT supervise courses and projects in the UK and other countries. Sometimes artefacts and projects are not accepted.

BCS provides the requirements for the artefact/project.

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Project types by programme: project requires to investigate, design, implement and evaluate an artefact for a particular problem. Meet the programme requirements, and investigate in the area. Possible artefacts: algorithms, database apps, mobile apps and desktop apps, web applications, websites, software prototypes, simulations/simulators, etc.

Supervisory team → my project is supported by two people:
- supervisor, who I will meet regularly.
- the second marker (feedback certain points of the project process).

Meet the supervisor 1 time per week for no more than 30 min. This is to update them about my progress. Initially it will be with all students, but after, it is individual. Behave professionally and attend all the meetings.

Project Lifecycle → 4 phases

- Project initiation → define a project idea, discuss it with supervisor and get agreement that the project is suitable. Once signed off continue with the main project work.
- Main work → depend on the project type. The order depends on the plan, however, 3 key parts of my work are required:
  1. An investigation
  2. "Development" work (construction of an artefact based on my project type).
  3. An evaluation of the artefact.

  Halfway, there is a mid-point review and presentation
- Delivery → submit the requirements of my project. It's a report outlining the work. The content of the report are outlined elsewhere.
- Assessment → 2 supervisors independently. Will be a meeting with

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Project management → manage well the tasks to successfully complete my work. Define a plan of walk at the beginning and keep it updated throughout the project process.
Arrange meetings with supervisors. Keep a log of all meetings attended. the logs and records that I keep will be assessed and will contribute towards my final mark.
Use Agile methods (sprints, Kanban, milestone) are good methods to utilise in the project. Define my milestone and set dates.
Good managment of myself (organisation and honest reflection) is the key.

Ethics → ask permission on ethical requirements for the project.

Report requirements → BSC states that report should include:

1. Elucidation of the problem and the objectives of the project.
2. In depth investigation of the context and literature, an where appropiate, other similar products.
3. A clear description of the stages of the life cycle undertaken.
4. A description of how verification and validation were applied at those stages.
5. A description of the use of tools to support the development process.
6. A critical appraisal of the project, with rationallage for any design/implementation decisions, lesson learnt in the project and evaluation with hindsight of the outcome and the process of its production (including a review of the plan and any deviations from it).
7. A description of any research hypothesis.
8. If the project is part of an enterprise, a clear indication

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of the part played by the author in achieving the goals of the project and its effectiveness.

9. Referencs.

Report structure
- Front matter section
- Main body
- References
- Appendices

} Commun structure with possible varieties in the middle.

Front Matter: do not number the sections of the introductory information. The pages should be numbered using Roman numerals except the Title Page. It includes: title page, abstract, declaration, aknowledgments and table of contents.

Main body: main part of the report. Each section should be numbered with Arabic numerals (standard). Introduction starts on page 1. Commun sections are: introduction, legal social, ethical and professional issues relevant to the project; now the structure varies depending if project is build or research oriented. Finally the conclusion to the report, summarising the findings, discussing related work, and any future work.

The main body maximum word count is 10K. Organise the report is the key: early in the project, plan the sections and the size. Start writting ASAP, ask for feedback from supervisor and don't start from the first blank page, write up parts of your work as ~~you~~ I do it. Use famal and academic writing style relevant to CS. Supervisor can give feedback in my early writing.

References: use IEEE style and software mendeley or Zotero.

Appendices: usually people do not read it.

Read template explanation and these togetha fa bette view.!!

(5)

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Word count → 20K limit. Figures and tables do not count.
Copyright and Intellectual Property Rights (IPR) → consider that my report will be in a public domain. Normally, I retain rights except if project is for company or university. Speak with supervisor if privacy in the project required or do not share the protected information. External collaborators is not the same as my supervisor!

Regulations → see extensions and late submissions, academic misconduct (plagiarism). Use software for referencing, paraphrase. To pass the BSc project, it is required 40%. (Read about re-submission).
Student support: supervisor, AGT (Academic Guidance Tutor), programme convenor, programme administrator, wellbeing team, AA team for general academic support (Academic Achievement team). Use IT Service desk for technical problems.

Library and Learning Skills Hub resources for Computing subjects:

- Academic Integrity and Plagiarism
- Learning Skills Hub (AA Team)
- Resources for BSc Computer Science
- Developing my writing skills video

} Not very useful (know already).

Project Report Writing guide for Computing subjects → 2 slides on Wad, that describes the domain, environment and context of the project/investigation.
+ Motivation
+ Aims, Objectives and Scope
+ Legal, Social, Ethical and professional considerations
+ Project management consideration
+ Literature review

} Project outline! Guide to

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+ Methodology
+ Implementation
+ Critical review (discussion)
+ Conclusion

write and generate academic content on the project report. Read again!

Collaborative Project and Task Management Tools →

Manage the tasks (Project Management) is the key. Define a plan of work at the beginning and keep it updated. Use Agile methods (task boards) to manage the project. Define my milestones and set dates for these. Organisation and hard reflection are the best mark for success.
Manage project and time. Some tools are collaborative (share with supervisor and record marks the management of the project and my time). Examples:
- MeisterTask → Kanban tool (task management and alerts).
- Teamwork → Full project management tool. Comes with learning curve.

Collaborative Outliner and Mind Mapping Tools →
- Mind Mapping → MindMeister
- Outliner / Note Taking → Dynalist

Academic Skills and Referencing → same information as before (repeated), except Studicity (Connect live and Submit document for review).
Cite them right → referencing, plagiarism, citations and documentation the references in full.

Important milestones : (in the project)

*Milestone 1 → Submit project initiation doc.

Decide a project idea and agree the idea with a project supervisor. Complete and submit a "Project Initiation Document".

*Milestone 2 → Project proposal and Supervisor allocation.

Complete the form about fuller project proposal for the second marker. Use "Project proposal Form" and must be signed by student and the supervisor. Upload the document at end.

Project can not be changed after !

*Milestone 3 → Project Check-in.

Review and validate progress.

*Milestone 4 → Mid-Project review and Demonstration.

15 of January. This is to ensure

- project provides opportunities to meet the learning objectives
- valid project
- scope and ambitions of the project are realistic for the timeframe

Read: "What you need to do to meet the mid-project review milestone!"

*Milestone 5 → Report Pre-submission feedback deadline.

Provisional feedback on a draft submission of my project report (send it to my supervisor).

*Milestone 6 → Submit FYP report and artefact resources.

Read the assignment guidelines and Turnitin. Check similarity score after!! It should be less than 10-15% (academic misconduct procedure will be initiated).

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*Milestone 7 → Submit a screencast of my project.

Short illustration of the work, like Power Point recording with talking behind. Or it can be a technical walkthrough while I explain the features (screencast is about 5-10 mins).

*Milestone 8 → Viva and demo week.

During my viva examination, I will meet with my supervisor and second marker to discuss the project and explain what I achieved. Some clarifications:

- A viva examination is a collegiate discussion and feedback session.
  - → This is a chance to talk about my project. Perhaps the only chance. Show why you found it exciting.
  - → Explain my project to the second marker.
  - The viva examination normally results in your project grade increasing, as my markers get a better picture of the work that I have done.

Project Ideas Database:

Wednesday, 05 Oct. 2023

Week-2

Roadmap my project: 3 diffeant type files, bat same content.

Last week: overview of module, learning style, overview of timeline, project definition and associated activities, relevance of project post-university, choosing a topic, what makes a "good" project and getting started.

This week: review of project milestones, project initiation deadline, project proposal deadline, steps to roadmap my project, roadmap template and ideation using mural!

Roadmap my project → milstones, report structure, marking scheme, dates and deadlines.
Use Agile method with sprints. Each sprint has: plan, design, develop, test, deploy, review and launch. → stages in each sprint.
Our project should have: routine, vision, direction, identify and manage risks, dates and times, report structure, milestones, and artefact activities.

36 weeks
4 sprints
6 reports
} See slide for better understanding!!!
(Excel)

Important near milstones → Project initiation
→ Project proposal
→ Project Check-in (before Christmas)

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Week - 3

Wednesday, 12 Oct. 2023

Prepare Milestone 1

(2 deadlines) 2 → more writting (Aims / Objectives)
↳ Ethics / risks

Do roadmapping

Read Reports for see projects (there is similar projects).

App, Python, SE, Algorithms, Relevancy → 8.00

2nd marker ≠ 2nd Supervisor

Milestone 2:

Aims → What achieve in the project? Inspiration

[#] → reference like that (No harvard style).

Objective → steps to deliver the aims.

Backgrounds →

Project risk → if no see it helps, is a big risk. Supervisor is not for teaching!!

Smart objetives → see slide.

Discussion with Charles about my project. Find Supervisor. (8)

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After class, at home:

Preparing for Milestone 01 and 02 (PDF and PP):

* Last week:
  Project milestones < Project Initiation / Project proposal
  Roadmap project and template
  Ideation using Mural.
* Milestone 2:
  Aims and Objectives
  Background
  Ethical issues and project risks
  Project misconceptions, good practice and next steps
* How to find a Supervisor?
  Show Project Initiation
  Email / contact and show Project Initiation requesting them as supervisor. Supervisor is guaranteed 100%!
* Milestone 2 requirements:
  Aims of the project → What your project aspires to achieve and why.
  Objectives of the project → The steps to take to deliver my aims.
  Terms of background → Why is this a suitable project for a BSc Project and what research have I completed to justify this?
  The aim of the background is to provide the reader with the relevant contextual information necessary to understand my work and motivation.

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Ethical issues and project risks → confirm in advance if my project requires ethical clearance. (See examples on slide).
Is there anything that might derail (unsuccess) my project? If yes, state it with an approach for mitigation.

* Project advice (misconceptions and good practice):
Project does NOT need to be "ground breaking".
Project does NOT need to be on "industrial scale".
Project does NOT need to be a "novel" or "unique".
Project does NOT need to have "dramatic societal impact".
Project does NOT require me to "invent".
Adopt smart goals for my project:
- be SPECIFIC
- MEASURABLE
- ACHIEVABLE
- be REALISTIC
- be TIMEBOUND

* Refine project ideas from milstone 1 and 2:
- What is my project domain?
- What I am creating / investigating?
- What problem does it address or solve?
- Whose situations are made easier by my project?
- How will I define the success criteria for my project?
- What difference does it make if my project is never started?
- How does my project help me for a post university ambitions?
- Explain my project in 2 sentences in a compelling way.

Filling form (docx) → project proposal form:

*Project description: 500 words maximum

Collect data (music, sound, songs), find the right algorithm to train / learn / teach a computer generate / create / play new music / song.

It is used deep learning and machine learning concepts to create / mix / produce new music. Computer will look as AI in the music field.

Human will evaluate the quality of product. It is possible to do it in real time a record the songs. Possibility to sell and deliver to Spotify / Youtube, entertainment industry (clubs, game developers, cinema producers, etc).

It is not possible to generate my own model of training a computer. I will use existing models and make some adjustments in initial data and / a model (algorithm to train).

*Project aims:

1. Computer create / generate music (quality is expected).
2. Apply research methods (future study of MBs) and familiarise with waves (communication and network).
3.

*Project objectives:

1. Collect adequate data (music)
2. Find the right / adequate ML / DL model to train computer,

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3. Recad and organise my music library. Organise streaming (real time) of my music. All try to realize it !!

4. Make volume management (computer vision and image recog.).

5.

*Background:

This project is OKAY to me because the main problem is to find the adequate algorithm to train a computer to do music. And there are a lot of models created by PhD and professionals.

There are tons of music data available. My task will be to find the right format, size, duration, etc. I will enjoy doing this (personal circumstances) and the same apply to output produced artificially music.

In case of "problem", I will develop computer vision to manage volume level of the computer while a song is played.

Some similar projects are: Magenta (Google), Mastro, ~~music~~ the my ML projects in the field of vision, speech, images and prediction of stock prices, for example.

References used to support my project:

:

:

:

*Risks, Ethics and other considerations:

I am not sure if quality of the output music will be good. I suppose it will mix/generate music, but not sure if good. This is why I insure my project with volume management (computer vision).

(10)

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Week-4

Wednesday, 19 Oct. 2022.

There are 12 weeks in semester 1.

Prepare milestone 2 (qustions to submit). Prepare management tool.

Introduction is the last to do.

Choose 1 thema.

Meet my supervisor face to face from 1:30 to 2:10. Like project.

Week-5

Wednesday, 26 Oct. 2022.

Project Success Criteria

Just the project.

Time →

Quality →

Cost →

After class, at home:

Summary week 4 an 5 (pdf and ppt):

Furtha preparation fa milestone 2 (week 4)

Last week → Aims, objectives, Backgrounds, Ethics and Risks.

Complete qustionaire fa milestone 2. Choose 1 theme (no 2). Discuss and refine/review project with supervisa. Use management tools and invite supervisor.

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Project success criteria (week 5)

Start capturing evidences with project management tool. Identify how may project be judged:

- Primary focus of a project → build for user and use case.
  → design for use and use case.
  → investigating something where the outcomes are unknown.
- Efficiency (speed) → technology speed advantage (coding improvements, connectivity improvements). Or if is there a user speed enhancement (reduction in manual labour, orchestration through a dashboard).
- Efficiency (size) → technology size advantage like smaller programme that does the equivalent job of a large programe; or smaller hardware deployment that does the equivalent job of a larger hardware deployment.
- Features → are there any features like an extended functionality, or optimized functionality.
- Originality → is there an originality feature as a new process or system, or a new approach.

Identify project success criteria and how it will be measured (success of the project)?

→ Comparison? (Testing before and after implementations)

→ Surveys? (User opinions, observations)

Conside in the project time, quality and cost!!!

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Week - 7 Wednesday, 09 November '22.

Week 6 was holidays & teaching.
See slides about submit milestone 2. Individual aproach.

Week - 8 Wednesday, 16 November 2022.

Template
10.000 wods is not a lot.
Abstract → short summary with outcome. Quick snapshot.
Below 10% plagiarism.
Acknowledge is important!
Background include motivation of the project.
Use 3rd person.
Literature review → discuss why chose RNN-LSTM and what are the alternatives.
Element of design → waveforms / pictures ...
Results →
Evaluation → test
Future work → what to do in future.
Appendices → proposals, data link...

Next week No class →

Week - 9 Wednesday, 23 Nov. 2022

No class

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Week-10 Wednesday, 30 Nov. 2022

I have dentist at 2:30 near university. No appointment with Dr. Li.

CHRISTMAS HOLIDAYS (and semester 01)

First week spring semester: Friday, 27, Jan. 2023

No new content on Moodle

Second week spring semester: Friday, 03 Feb. 2023

No new content on Moodle

Demonstration Milestone 3!! Uploaded some midi files, examples (music) and explanation/aclaration of my project to 2nd marker.

Third week spring semester: Friday, 10 Feb. 2023

Demostration Milestone 3 again with more details!!

No class!!

Rebooked for Tuesday 14 (face to face).

Fourth week spring semester — Friday, 17 Feb. 2023

No class until 10th week and end spring semester

Submitted Milestone 4 → Report (24 March)

END SPRING SEMESTER → PRE-SUBMISSION REPORT

EASTER HOLIDAYS — 03-17 April (2 weeks)

First and last summer week — Friday, 21 April 2023

Book Dr. Li on 18 April, 25 April, 02 May — Face to face

09 May → NOT POSSIBLE

Book appointment Dr. Clarke (pre-submission report)

END of MODULE

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Logs / Meetings / Records with the Supervisor

In class, all students. 29/Sept./2022.

Welcome. Listen some ideas. Decide < Work / Further study . Familiarise with Moodle and project structure.

After class → read about 60% of Moodle and created software accounts like Kanban board, mind mapping, GitHub, etc.
Think about my project and decide ASAP.

In class, all students. 06/October/2022.

Analysed and discussed project ideas from "mural.com" answering simple questions. Lecturer recommend one of the 4 ideas.

Familiarise with time table for all the year. Teamworks presented (use it), good project management.
Before Christmas, project should have respectable "size". If not, will be a problem!
Justify the reason of my project !! Why I am doing it?
Class changed to Wednesday evenings and different location (until Christmas).
Do first milestone! (1) NLTK for text sentiment analyser

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In class, all students. 12 October 2022.

Wad Clouds visualisation.
Find supervisor. Clark can NOT be my supervisor.
Prepare Milestone 2 and email to Supervisor. Complete ← Aims, Objectives, Background, Ethics, Risks
Make project real, simple and easy!
Discussed my project with Dr Clark → REDUCE IT!!

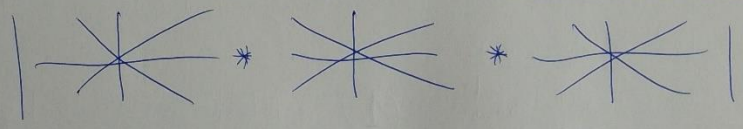
In class, all students, and private 19 October 2022.

Milestone 2 extended deadline. Commented the questions to submit (choose 1 thesa, not 2 or more!).
Setup project management tool and invite supervisor.
Title can be changed latter, but not the project idea. Introduction is the last to do.
Meet Dr Li every week by face to face or meet team (online).
Wait for some useful information from Dr. Li.
Project idea accepted!!

In class, all students, and private 26 October 2022.

See slides for better understanding (meet supervisor). Chat in person about my supervisor and my project.

No class wednesday evening with Dr. Charls 02/10/2022.



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In class, private — 09 ~~October~~ November 2022.

Submit milestone 2 on Friday 11.

Start project, step 1 (Raw data) !!!

In class, all students — 16 November 2022.

Next week will be no class because Dr. Clarke go to Manchester.

Start writting the report for the project. Collect references (IEEE).

No class — 23 November 2022.

X

30 November 2022.

CHRISTMAS HOLIDAYS (end semester 01)

In class, all students — 27 January 2023.

Start report each day a little bit. It is bad organise 10k words.

Milestone 3 → prepare it before 03 February 2023.

Viva → by the voice in latin, 20 mins.

No classes Friday morning. Can come for particular questions! (2)

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Litearture / Technolog review (repat):

Max 1500 wads.

Reduce music with RNN-LSTM and RNN GRU (later)

Sound management

Survey

Sound characteristics (graphically).

EASTER BREAK → 2 WEEKS

Send email Dr. Li
D. Clarke
} Viva on 09 May at 12:00

↳ Repat submitted previously
Video demonstration submitted previously

Bring → laptop
→ paper
→ preparation for the VIVA demonstration

END MODULE

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ACADEMIC PAPER SUMARIES

Google Research, teams, brain team, Magenta:

Magenta is an open source research project in ML for creativity. It uses deep learning and reinforcement learning algorithms. Models use TF and are available on GitHub.

Our wall: NSynth (Neural Synthesizer, deep NN to learn the characteristics of sound and generate sound. It can be played via any MIDI source. Algorithm uses decoder-encoder with features represented as arrays. Uses TF library and OpenFrameworks library. See GitHub for more details).

Onset and Frame: dual objective piano transcription (MAESTRO (MIDI and AUDIO Edited for Synchronous Tracks and Organization), MIDI: this can read playing piano sound and transcribe to MIDI for later use on synthesizer for example. Use of CNN and LSTMs. Predictions. Automatic music generation. Piano scribe (online tool).

Music VAE: Creating ~~not~~ a palate ~~of~~ musical ~~sounds~~ scores with ML (musical ideas with NL. for Explanation of characteristics of the data. Melody Mixer, Beat Blender and latent loops are browser applications. Musical sequences are high dimensional, use autoencoder (encode + decode vector of numbers) for reduce vector dimensions. RNN. VAE = variational autoencoder).

Magenta Studio (is a collection of plugins on Magenta. It is a ML techniques for music generation. MIDI files, NN, predicting notes and predicting sequences of notes and mixing music (merging music ideas)).

Google research publications → magenta has 26 publications (read titol to select the good one).

One

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Magenta: music + art with ML. Creativity. Demos are applications on web + + code + blogs.

+ Get started → some conferences on youtube (2019, 18 and 2017).
+ Studio → repetition previous paper.
+ DDSP-VST, Neural Synthesis in your DAW → transform sounds and create new ones. Has more information on bottom site.
+ Demos → apps (repetition previous paper).
+ Blog → read titol and short text to find the right article to me. Each entry is extensive explained with Colab code and pictures.
+ Research → select magenta (collections) and it is the same 26 publications. Academic paper. Datasets (used in the research project).
+ Talks → conferences about magenta (repetition previous paper).
+ Community → find GitHub Python code and discussions.

Talks: ML algorithm, creativity of computers, create music with NN. TF, predict notes. Deep learning and reinforcement learning. Magenta. Encode-decode (autoencode), pip install magenta. LSTM, ML generative models, TPU (like GPU but faster), music data is complex, model music is difficult, MAESTRO dataset (MIDI notes), musicians use ML.

See code in Colab (ready to run). GitHub has code/documentation as well.

Melody generation with RNN-LSTM (youtube, Valerio Velardo):

Video 1 → Generating melodies with LSTM Nets → networks, TF, Keras, time series data (melodies), deep learning, MIDI, fit music to the network. Music21 (library) for symbolic music data; melody = pitch + time. Prediction of next melody from a bound of many melodies. Prediction from RNN-LSTM model.

♩♩ → RNN-LSTM → ♩♩+𝅗𝅥
♩♩𝅗𝅥 → RNN-LSTM → ♩♩𝅗𝅥+♩
⋮
SONG at the end !!

Melodies have patterns that repeats, a slightly modified. LSTM is good for this. GAN, variation auto-decoders is another options (theories).
Dataset → songs (ESAC).

Video 2 → Music theory concepts for melody generation → music is complex. MIDI is a protocol to play, edit and record music (note notation); MIDI maps each note to

an integer. MIDI has pitch + duration (time). NN will generate melodies, music. Melodies input to LSTM will be integers (array of information) representing MIDI information.

Video 3 → Preprocessing songs dataset, pt. 1 → generative music. Krn files are encoding for symbolic music (music representation). preprocess.py (code to apply to a dataset to preprocess it). Music21 enable to manipulate simbolyc music data and make conversions formats (kern, MIDI, MusicXML → m21 → kern, MIDI, ...). M21 enables music representation. Music21 can render a song, musescore (.show()), but this render is for music writters. Deep learning model like standard note duration (0'25, 0'5, 0'75 ... 3, 4), this is why filtering (preprocessing initial data ("has_acceptable_duration(song, acceptable_duration)"). Transpose songs (to Cmajor and Aminor) for only the model learn CM and Am, not the 24 keys (reduce dataset). Transpose is a preprocessing function. Transpose function "changes" initial song only.

Code for preprocessing continues in video 4. With Music21.

Video 4 → ..., part 2 → continuation part 1 of preprocessing data to fit it to the NN. Here I will encode songs with music time series representation and save the songs to .txt, individually. "encode_song(song)" receive m21 object and conveat it to time series notation (list). Pitch = midi number. List need to be encoded as str. "dataset" is the folde for .txt files. The and is a long string with numbers and _ and r. In next video continue with merging all txt songs to single file for train, with a separator between songs. Looking for a single dataset to pass to LSTM.

Video 5 → ..., part 3 → collate all the encoded songs in one big file! It is easier work with one file for a NN training purpose. String of all songs saved in "file_dataset". 64 will be the number of elements between each delimiter ("/"). Sequences of 64 elements in a file for the NN training process. Numbers are MIDI notes, - time for note, r indicates rest. NN are able to read numbers, not strings (in this case). Do a maping between symbols in the dataset and integers. "create_mapping(...)". Dictionary in json file to load after in the training process. "vocabulary" = mapping + save as JSON file. (Two)

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Input json packet and create file called "mapping.json". It is in one line, but can be done as column (keys are symbols in the dataset and all are mapped to integers).
In next video use single dataset + mapping to feed LSTM network for training. Fixed sequences (fixed lenght = 64 elements in the time series).

Video 6 → How to create melody sequences to train a NN → last step of preprocessing before training. Preprocessing is time consuming! Convert songs in symbolic notation into integers (map), and create sequences for training. "convert_songs_to_int(...)": songs to int, using "mapping.json". Final will be a list. Supervised task, because the target is predict next note based on sequence (previous note). Use "generating_training_sequences(...)". Sequences are fixed in lenght, and this is the training data. Each input sample will be 64, and it move to the right with prediction. "One-hot encode the sequences" is the easy way of deal with categorical data in a NN; targets is a 3D array. The end of video is:

inputs = ndarray: (2512, 64, 18) → [[[...], [...]], [[...], [...], [...]]...
targets = ndarray: (2512,) → [..., ..., ...
songs = str → '76 _ _ _ 74 _ _ 2 _ 65 _ _ _ _ ...

→ sequences, lenght each sequence, numb of categories (symbols in mapping file).

Video 7 → Training LSTM network for melody generation → feeding the previously generated sequences to the LSTM network (build and train LSTM network). "generating_training_sequences(...)" is what we will use in this video. "train.py" with TF and Keras. "build_model(...)" with 1 layer with 256 neurons. In Keras, first build and after compile the model. Building a model in Keras can be sequential and functional (more flexible API for complex architecture that has non-linear topologies, but today is linear topology). It is possible to use TF GPU version (installation diferent, see online). After build, train the model (.fit()). Network uses backpropagation and uses batch_size that is 64 in our case). Save the model to load after (we will use a class), in .h5 file extension in the working directory. h5 is Keras TF models when saving them. Do with GPU!
No test data because is music. Only use test data for evaluation. Use 100% of data for training. "model.h5" stores all the information about the model.

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Video 8 → Generating melodies with a NN → build generative model class to generate music / melodies. Folk songs used in training. "melodygenerator.py" will have a class that will get around our Keras model. The end is a MIDI. From time series music representation to integers and viceversa. "generate_melody()" is the function that will use a "seed" (base) to generate music. Network should continue the melody seed.

64_ _ 63 _ 59 _ _ _ _ → this is the music representation in time series. Seed should be limited in each step (64 in our case). "temperature" impact the way we sample output symbols from the probability distribution that comes with the network. "seed" is a string but we want a list (easier to manipulate). Integers is the way of input data to our NN! "seed is a list of integers (mapped). Prediction in Keras, in our case is 1 (1-D); from 2D to 3D array in "melody_seed". Prediction with probabilities (probability distribution). "sample_with_temperature" is more flexible, shows creativity / exploration of the network for sampling.

Update seed is append last "output_int" in each iteration. After map integer to symbol (opposite process with "mapping.json"). MIDI notes. Now it is possible to generate melody sequences starting from the seed.

"melody" is generate from "seed" and both are string (time series music representation). Melody sequences are produced by the trained model. Next step is from visualizing melody to convert it to MIDI to analyze it in a music notation software (musescore for example).

Video 9 → Converting generated melodies to MIDI → from time series music representation to MIDI file. "save_melody(...)" with for loops and if / else statements. From music21 stream to MIDI file.

More temperature = more unpredictibility in the network. Non deterministic algorithm (different in each run the output). See output (notes + sound) in Muse Score 3.

Less temperature = less unpredictable melody.

Generative model using RL, manipulating symbolic music data (musician) → Three

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Project milstone: Generating music with ML:

ML make music (human music) with diffrent approaches to music composition: NB and NN models. NN specifically will be a vanilla NN, an LSTM RNN, and an encoder-decoder model RNN. Each algorithm has diffrent data organisation and music creation.

NB and vanilla NN → organize notes temporally, where song has specific time interval where a note is played because each note will have a start and end time within a given piece.

LSTM model → song will be outlined with new note events, where every time there is a new note, a new vecta is created. The model take one note and output a note at a time for both cass.

ED model → song organised by chords with varying lenght. The model will take as input a sequence of notes and output sequence of notes.

Input → MIDI file (note or pairs of notes), to generate new sequence of nots from models.

Evaluation → NN success is measured with prediction vs real next note. For NB the generated music, the comparison will be with random (flat) distribution of notes and after ask people for quality. LSTM (Numpy, single LSTM layer with 256 hidden neurons, softmax, cross entropy, Adam algorithm) was okay after 20 epoch and perfect after 100 epochs. Similar sound as original. ED model implemented in Pytorch and music was created feeding sequences of notes from the test set. Not good quality, mediocre quality.

Conclusion → 4 algorithms, best LSTM-RNN

Music transcription modelling and composition using DL:

Apply DL, LSTM netwarks. Music expressed in high level vocabulary (ABC notation).

Introduction → DL walks with data (music data in this case). 3 hidden layers of 512 LSTM neurons. 2 approaches to train the model:

- character based → the system builds a model by joining probabilities of each textual character given 50 previous characters.
- token based → same as character, but many characters.

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Background → LSTM is DL (more than one hidden layer). Non-linear operations. RNN direct one output to another input. Deep RNN is when many layers do feedback and the result is PREDICTION from data. LSTM has activation function to increase number of parameters in training.

Fa music, RNN and LSTM is great because music is sequential data. Pitch is an auditory sensation of musical tones. Many LSTM approaches are possible.

Creating LSTM network (generative) → most transcriptions are monophonic, but some have multiple voices. Data training has millions of ABC characters, 47.000 occurrences and there are 135 unique characters. Do same fa tokens (4 millions tokens (pitch + duration + measure), 23.000 transcriptions and only 137 unique tokens).

The LSTM network has 3 hidden layers with 512 LSTM blocks each, and input/output units equals to the number of characters a tockens in the vocabulary. The output is a probability distribution. The numbe of parameters in the model are 5'5 millions.

To build and train the model, use RMS prop algorithm and gradient clipping strategy, bucketing strategy. 95% train and 5% test (measure the prediction of characters a tockens). 10 to 20 epochs.

To generate transcriptions (output) use a seed a random model to initiate and add characters / tockens in timesteps.

Demonstration of the generative LSTM network → statistical analysis of outputs (comparison of real model with the trained model). In total of 6.000 transcriptions are analysed. Characters model output endless and better fa human ear. Music theory is necessary to understand.

Discussion and reflection → the aim is create music with 2 kinds of generative systems using DL and many textual transcriptions of music. The model produces ABC output. Statistical and numeric analysis done

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with output and available data. Listening music is one more analysis done in this study, without creator or professional composer.
Conclusion → RNN and LSTM networks used to music modeling and composition. Explanation of learned models (statistics of the generated transcriptions and the training data). Models uses probabilistic rules to arrange notes / tokens.

Music Generation for Novices Using RNN:

Abstract → creation of music for people that don't understand music. Use of RNN. The idea is build a model trained with existing melodies and generate new music based on the training. Music and songs will be generated without playing physical instruments.
Introduction → music generation automation. MIDI files used. Melodies have sequences and patterns. RNN takes series of inputs and predicts series of outputs. Few hidden layers are used.
ABC Notation represent the 7 notes in music (A to G). Music theory helps to read music. File extension is .abc. Exist tools to convert music in ABC notation to traditional music notation (Sibe extension). It renders music and transforms them into audio files. Sheet music → MIDI.
Related work → LSTM (generative). Output MIDI format. But other approaches exist. Evaluation, verification ~~of~~ of the accuracy is mandatory. Algorithmic melody generation. A lot of IRISH music in ABC notation exists (folk).
Methodology → Character RNN model. Input is a series of characters and the output is a prediction. Many to many RNN. Sequences will be generated.
Categorical Cross-Entropy will be used as loss function for probabilities.
Last layer of the RNN model will use "softmax activation". Number of these units will depend on the number of unique characters

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used in the training model. Backpropagation will be used with Adam optimizer. The result will be a trained model with the ability to take music notes as input, learn the sequence to generate new music. There are 3839 characters in the dataset, of wich 73 are unique. Data visualization → dataset is abc notation. The model was trained 4 times (90% accuracy and music is melodious). 80 epochs were used.
Results → a. In the form of MIDI → predictions. Continuous concatenation of the characters outputs will generate some lenght music.
b. Conversion of MIDI into sound → see fig 7 and 8.

A discriminative model to generate melodies though fvolving LSTM RNN:

Abstract → LSTM-RNN to generate music. Accuracy achieved 90%.
Introduction → RNN predictor for compose music, predict notes.
LSTM music compile → LSTM architecture is good for this purpose.
Experiments → different RNN (not useful).
Conclusion → X

Music generation using DL: by Dr Li recommendation to read.

Abstract → use LSTM NN for generating musical sequences in ABC notation. Input are arbitrary notes
Introduction → generative NN architecture. ABC notation to represent music to audio file.
Literature survey → cha RNN, GANs (Generative adversarial N), LSTM.
Survey I → LSTM generates musical notes using RNN. The model is capable to recall the previous details of the dataset and generate music, with harmonic and melodic note sequences from MIDI files.
Methodology → used ABC notation (+letters). Backpropagation. 87 unique characters (dictionary and integer encoding. 3 LSTM layers for

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the multi-class classification problem. Softmax activation function. Dropout layer to avoid overfitting. Adam optimizer used. The network excel at predicting the next member of the sequence by making decisions based a context

Conclusion → LSTM-RNN model produces musical sequences that matches the dataset (sequence's grammatically coherent). The output is converted to MIDI

Future scope → model monophony (dataset of single instrument), Polyphony (multiple instruments) is for further progression.

END of Academic Paper.

Draft / Preparation milestone 2:

Project description → Project type = academic defined (research based).

Other ML approaches are possible, like GAN.

If output is huge and diverse, organization is required (manual at the begining and in future should be automatic).

Website that sell AI/ML for music → No at the beginning

My project will investigate (no building, not designing). 80% investigating and 20% designing. It will be original with features (succes criteria)

Week 5 (Project success criteria is next information to include in the project plan).

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CHRISTMAS HOLIDAYS (end semester 01)

Preparation Milestone-3:

Demonstration (Mid-Project Review Meeting): practical demonstration of the technical of the artefact. Technologies used. Show project management tool and project report advances.

* Project should be on an intermediate/advanced level (progress)
* Project plan, management, task tools, evidences to the supervisor ...
* Report is in draft and available for review
* How many meetings with supervisor ?
* Evaluation of my work → building, designing, investigating → faces of the project
  → efficiency < speed < technology
  → size < user technology < smaller software < smaller hardware
  → features (extension, optimization ...)
  → originality

  Success of my project: comparisons, surveys, ratings, opinions ...

* Show tools → GitHub, teamwork, papers from class, dynalist, mapmind, circle CI, YouTube ...

TIME, QUALITY, COST ? FYP measurements !!! Success criteria !!!

2nd appointment for milestone 3 with second marker

At this stage investigation/research should STOP at the end of February 2023!!

Six

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Summary MILESTONE 3 → Job done demostration

1. FYP_undergraduate → LSTM (256), ERK
2. FYPchina → LSTM (256), CHINA(han, natmn, hanx)
3. FYP_DL_china → LSTM(256,256,256), CHINA (han, natmn, hanx)
4. FYP_DL_china_maxHiddenLayers → Not trained (4 STM, 256, 512, 1024, 512, 256, CHINA(han, natmn, hanx)). (Computer related and training disappear... oh5 NOT saved)
5. FYP_DL_pianoroots → Not trained because complex data and my code can NOT preprocess!
6. FYP_GatedRecurrentUnit_ERK → GRU, ERK, 256.
7. FYP_GatedRecurrentUnit_CHINA → GRU, CHINA, 256.

CHINA → 2 mappings < 0 to 44 → FYPchina / 0 to 43 → the rest (3 folders in TOTAL)
ERK → 0 to 37; -, 2, 1, 81(max) and 45(min) → both (2) datasets

0 to 44 china → 1, -, 2, 98 (max) to 47 (min)

0 to 43 china → 2, -, 1, 98(max) to 47 (min) → all 3 same

81-45=36 → 46 for example DO NOT exist } Some numbers
98-47=51 → 49 for example DO NOT exist } DO NOT exist.

Google Colab is MUCH FASTER !!!!!!!

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Some possible seeds:

*3rd up:

55_60_60_60 59 60 62 64 ... → erk

67_67_62_62 64 67_67_67_62 64 65_65...

china

*3rd down:

60_|_|62|60_|60_|64|... → erk

72_|_|_|74_|76_|74|_76 74 72_69_67_...

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

china

• WAV file ← sound analysis
• survey format file

Audacity does NOT convert files directly to wav!

Online converters: "www.online-convert.com", gives the highest size output (MB & KB).

Survey: 2 erk models (LSTM, GRU)

3 china models: 2 LSTM (ML, DL) + 1 GRU

} 5 models (2 erk + 3 china)

7 notes erk: 60_ _62 60_60 → E

7 notes china: 72_ _ _74_76 → C

Mix → 60_ _ _60_60_64 → A

1 2 3 4 5 6 7 8 9 10

Seven

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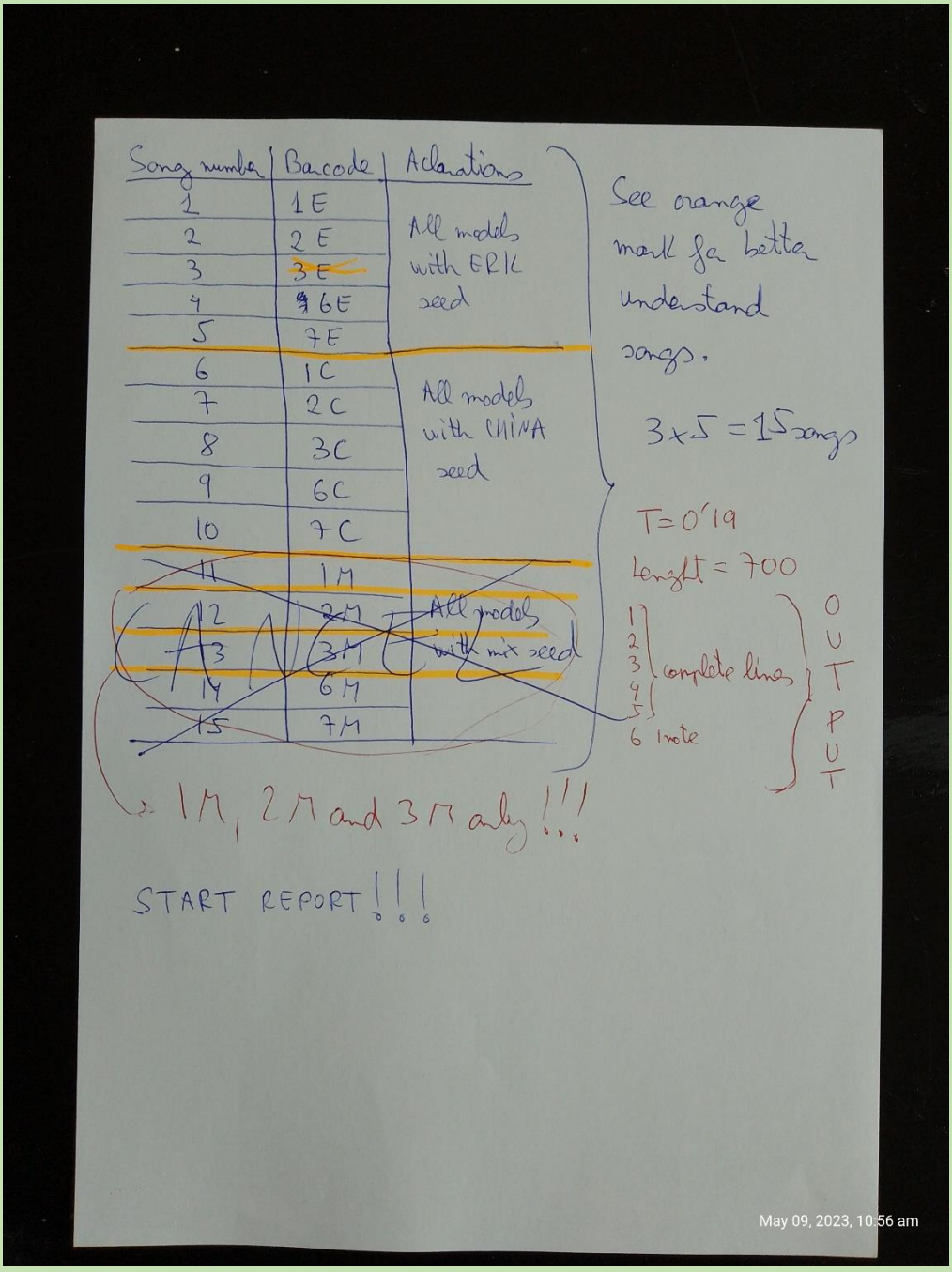
Song number | Barcode | Aclarations
1 1E
2 2E
3 3E
4 6E
5 7E
All models with ERIK seed
6 1C
7 2C
8 3C
9 6C
10 7C
All models with CHINA seed
11 1M
12 2M
13 3M
14 6M
15 7M
All models with mix seed
See orange mark for better understand songs.
3+5 = 15 songs
T=0'19
Lenght = 700
1
2
3
4
5
complete lines
6 note
OUTPUT
1M, 2M and 3M only!!!
START REPORT!!!
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PREPARATION MILESTONE 6 and 7

Repat peparation is appart!

* GitHub documents : Academic papers < initial / final → mae preise
* ERK → LSTM
* CHINA → LSTM, CHINA → LSTM (DL), mae hidden layers
* Piano-sonatas (mae hidden layers)
* GRU < ERK / CHINA
* VISION
* MUSIC SURVEYS, emails extraction (python) from outlook
* Initial data (MUSIC)
* Google Chrome fa training ERK an GPU (fasta
* Software → MuseScore 3
  → Audacity → examples of mixing single songs
* sound analysis in fam of waves
* Official upart + video pesentation (pptx).

---

* Obs Studio fa video recording (zftware)
* Youtube
* Mixing with Audacity and opnating MuseScore files
* Audio.beta website (Audacity music upload online).

Eight

May 09, 2023, 10:56 am

Video preparation → 5-10 minutes

September 2023 - May 2023 → 8-9 months

1. Decided about music. Decided about Knn and ML field
2. Improved code from Valerio Velardo + add extra features: vision
   more initial data + mixing knn
3. Sound analysis
4. Surveys + email extraction
5. GRU is worst than LSTM
6. Some LSTM Deep Learning networks do NOT work
7. Analyze output performance
8. Audacity mixing + muse score new music generation
9. Learn about music
   sound
   physics
   communication / ART (artistic creation)
10. Influence modules, university and people (students).

May 09, 2023, 10:56 am

Supervisor recommendations video:

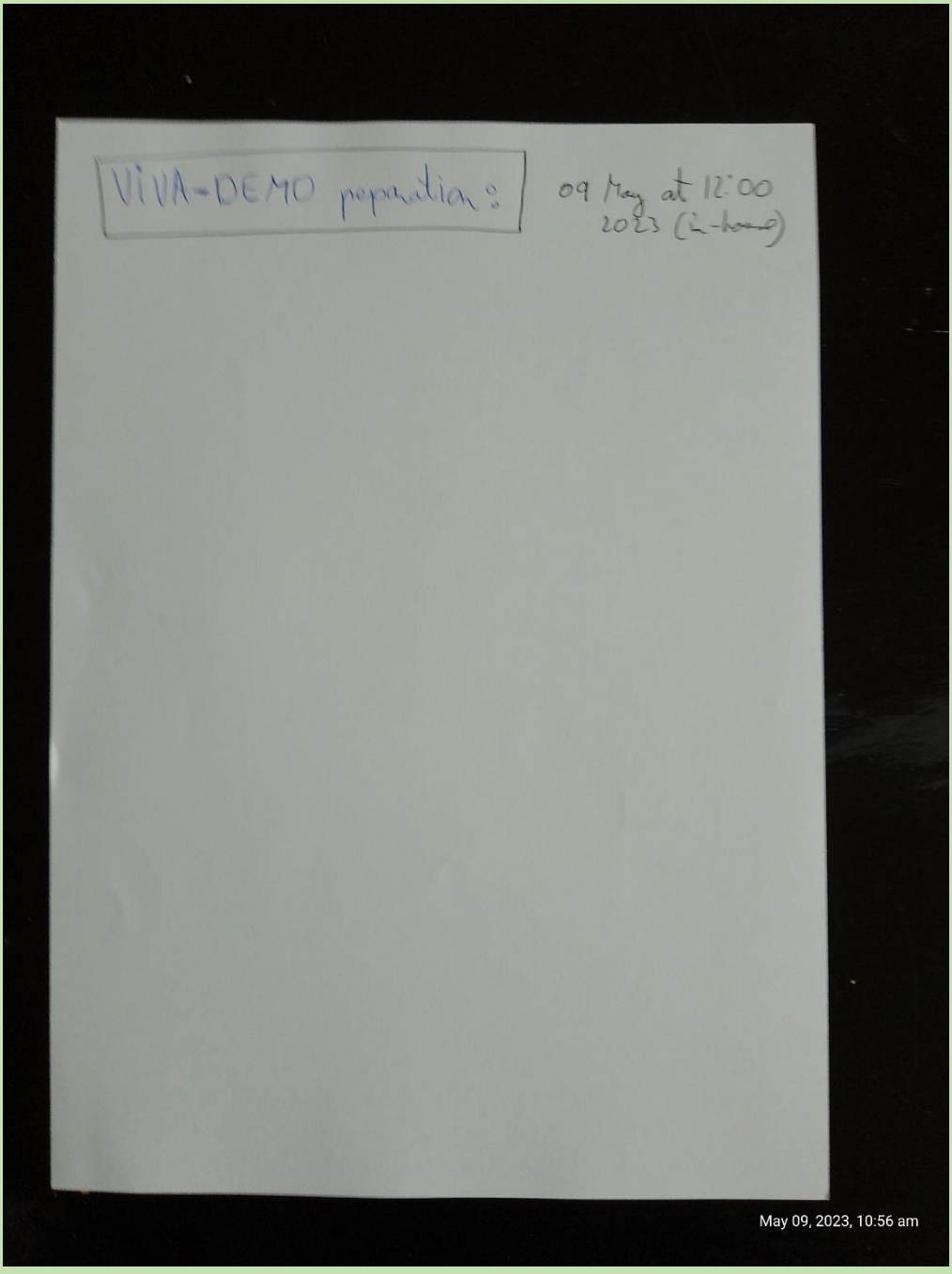
1. Motivation of project
2. What is the project
3. The output / implementation
4. Evaluation (accuracy)
5. Challenges / solutions
6. Future work → do it different < How / Why ?

Notes for screencast (while preparing for final video):

* Helped decide study AOIs in the UIC (2-year)
* Research project

Nine

May 09, 2023, 10:56 am


VIVA-DEMO preparation:
09 May at 12:00
2023 (2-hours)
May 09, 2023, 10:56 am

##########################END##########################