

Project Report

Title: IN MEMORIAM, a shift into the post-democratic.

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GitLab Repository: <https://gitlab.com/mtabo002/post-democratic>

Tumblr Blog: <https://inmemoriamdgc.tumblr.com/>

Daphne's Running Commentary blog: <https://daphnecaruanagalizia.com/>

A Change of Focus, the concepts behind the project. Why?

Text is powerful.

To revolve my final degree project on the murder of Daphne Caruana Galizia, a sister to me by nationality was not my original intention yet in hindsight, I now think that it should have been my focus from the very beginning.

In 2017 I moved from my little home-town of Qala in Gozo, Malta to the city of London in order to pursue studies in the arts at Goldsmiths College, University of London. Little did I know that less than a month later, the brutal murder by car bomb of the most prominent journalist in my country would completely change my perspective on Malta, and that I would never be able to look at my country the same again.

This project is therefore deeply personal because although I did not know Daphne personally, I kind of still knew her. This is because she was deeply embedded in modern Maltese culture, instrumental in keeping local career politicians in check, with a blogging ethic that according to her husband “took no prisoners”, a blogging ethic that most definitely got her killed, she knew the risks, yet she persevered in the upkeep and practice of one of democracy's most important pillars, the freedom of speech. All of this as she embattled arson attacks and death threats.

The culmination of investigations into the murder of Daphne reached a peak in late 2019. Recalling what I had blogged on the first of December of 2019, I make mention of mass protests all over the capital, reflecting on the prevailing situation as if Daphne was seeking justice from the grave. The situation at the time seemed very fluid, and strongly resembled the political instability of the troubled 1980s in Malta as described by family and friends.

Headway in the murder investigation resulted in a political crisis as a result of prominent figures close to government emerging as prime suspects. The crisis and protests continued until the then-incumbent prime minister was forced to resign, and a political race was initiated within the part to find his replacement. Sadly, the winning candidate was elected on his proposal of “continuity”.

As a result of all of this, my interests and inspirations changed overnight, and to base my final project on Daphne as cliché as it sounds, was a no-brainer, an obvious choice which makes a lot of sense once put in context.

In Memoriam is an A.I art piece with the intention of up-keeping and preserving the memory of Daphne Caruana Galizia and the stories that she uncovered. The project has been adapted and fashioned into an automated twitter bot which tweets wholly untrue (albeit inspired by reported fact) text learnt from training machine learning models on datasets which contain only text extracted from Daphne's Running Commentary Blog, which I have linked above and also in the Twitter profile of this project.

I'll finish this part of the report with this. There is a Maltese saying that goes something like this: "Id-dnub ma jorqodx". The direct translation of this, is that "Sin does not sleep", bottom-line being that in the end the truth will out some way or another. Whoever may have commissioned Daphne's murder, Daphne must have been a thorn in their side, and they must have thought that by killing her they will silence her and prevent the truth from coming out.

I want this project to reflect the above Maltese saying, and to be a reminder that a large portion of uncovered crimes and stories still need to find justice, an assurance that they won't be swept under the carpet. To me, Daphne was more than just a journalist, she represented an ideal, she represented principles and values that all of us should strive for, the quest for a cleaner government free of corruption and accountable politicians, whatever your political leaning may be.

The setting, using Twitter as an exhibition space.



In Memoriam, alive.

My decision to adapt my project into a Twitter bot which tweets out the results of my machine learning modelling and training was rather last minute however it serves multiple purposes.

Firstly, it ensures that I can remain anonymous behind this project (which is exactly what I intend to do, I have my reasons for this.) and on the other hand it allows for the project to be out there and available for the public.

At the moment the project has not had too much interaction given it's only been tweeting for about two weeks, however in due time I intend to follow some accounts on it including Maltese civil society NGOs and to start interacting with their posts. I could perhaps further down the line explore the use of hashtags to appear in topics, etc. I intend to pick this project up again in the future, after I have graduated and to develop it further.

To host this project on Twitter allows me to direct my audience to a number of resources which I think are important for an in depth understanding of why I chose to do my project on Daphne. I express this using the pinning function on the project's Twitter, directing followers to a podcast which explains all.

The twitter bot is publicly accessible therefore anyone can access it, retweet, show support, criticise it, perhaps even report it if they are agitated enough by it, direct messages are also open, the profile can be shared, every individual tweet can be shared or like, my point being that the opportunities for interactivity are many and they are accessible.

As a website link in the project's profile, I chose to direct the audience to Daphne's still online blog Running Commentary, which I believe is very pertinent to the project and also to the current Maltese geo-political situation. Moreover, I also make very clear in the projects description that the results of this project are wholly untrue albeit based on reported fact, this is to protect myself and my family from any libel suits which may or could be initiated by anyone who argues against or is agitated, personally offended by what the project tweets.

To use Twitter as an exhibition space and an environment to display the results seems to have added a lot to the project given that this broadens the scope of opportunity when it comes to piece exposure, organizes the project's appearance, allows for a continuous output and also for a progressive reveal. Finally, it also strengthens chances for the project's own further development and evolution.

In regard to what I am trying to communicate to the audience I believe I can refer back my previous statement regarding Daphne's fight against corruption and the principles and values she held. Perhaps what I am trying to convey, is that this is not Daphne's fight alone, we all share this responsibility together, and we all need to play our part and participate. I hope that by keeping these subjects alive via these tweets, people are given a stark reminder of what reality consists of, away from partisan propaganda tv networks and the lies that they are fed. Apart from this, I also think that In Memoriam serves another purpose, that of an online mourning site for Daphne, where her life and excellent work is remembered.

Technical Research, the knowledge.

After taking modules in Machine Learning and Artificial Intelligence I was very much inclined to orientate my project around these skills, to put what I had learned into practice. Moreover, Daphne's blog by the name of Running Commentary proved to be the best resource for research and training data with over 90,000 blogs spanning a decade old career of investigative journalism.

I must add, that on the 17th of May 2020 I blogged about energy consumption and sustainability considerations in the working of this project. Machine Learning models involve great amounts of energy to learn and train, therefore in this spirit I committed myself to have this project only be reflective of Daphne's blogs 12 months prior to her assassination, therefore October 2016 through to October 2017. A positive outcome of this is that this gives room for the project to be developed, explored and evolved further at a later point.

Putting the datasets together. [pdScript.py, pdImgScript.py]

In order to achieve the necessary skills to put together the datasets and web-scrape the elements of text from Daphne's running commentary blogs, I took a couple of courses on Codecademy which familiarised me with the BeautifulSoup library which allows for the ability to parse html objects and be able to search them for specific elements (in this case a <p> tag, commonly used in html to display text).

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▼ <div id="page">
  ▶ <div id="header">...</div>
  ▶ <ul class="anchor-menu">...</ul>
  ▼ <div id="content-wrapper">
    ▼ <div id="content" class="single">
      <div class="ad responsive">
      </div>
      ▶ <div class="post" id="post-97967">...</div>
    </div>
    ▶ <div id="sidebar">...</div>
    <br style="clear:both">
  </div>
  ▶ <script>...</script>
  <div id="footer">...</div>

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Raw html from inspecting a Running Commentary blog post in the browser, highlighting the unique identifier of every blog post, the post-id

After inspecting raw html code by running a Running Commentary blog in my browser, I came to realise that every blog post had a post id, and that this post-id can be specified in the URL to take you to that blog post. Therefore, combining the skill of web scraping and this new-found knowledge I put together a script which looped through a range of post-ids, crawling into every blog post within that range, scraping the text and appending the output to a .txt file.

This would later also develop into extracting images from the blog using a similar script in order to introduce a visual element to my project. This is because given the last-minute decision to host and present my project as an ever-evolving twitter bot, it seemed very unnatural for a feed to only contain paragraphs of text. Sprinkling some images here and there make the experience seem more believable.



Tweeting status and media.

With regards to further aesthetic choice, I chose to use artwork by Maltese cartoonist Burlo', in both the profile picture and the account's header image. I chose to use his work, because he

knew Daphne personally and also because his work and cartoons have ever since become kind of iconic and easily recognisable. Both artworks have been produced after the murder and of



Graffiti of Daphne in different locations in Malta

course revolve around Daphne, with the profile photo displaying a strong writing hand, which is going nowhere, and the header image displaying Daphne's eyes, which have since been graffitied all over the country on random buildings, hence them being rather iconic, a symbol of the current struggle.

Machine Learning training models, experimenting with different model architecture.

In all of the training conducted on different machine learning models in this project, the goal was always to minimise the loss and output believable, consistent and readable text, which has some sort of similarity or closeness pertinent to the writing style of Daphne Caruana Galizia.

Using a Jupyter Notebook environment by a trial and error process, I tried multiple different model architectures, and found that to train less in depth most of the time yielded better results. In the end I chose to stick to 4 different models, trained on different datasets and to load and run them at random by the script itself, also loading the respective .txt datasets to put together the seeds.

In all of training, I found that the better architecture in this case, was an embedding layer, followed by two long short-term memory layers, a drop out layer for regularization, and finally two dense layers. The result of this type of architecture, is a good predictor by probability of the next word. Therefore, the deployable script will load this trained model, randomly choose a text seed and then using learnt patterns and probabilities it predicts every next word.

Initially I had experimented within some architecture put together for a previous project of mine, which concerned the use of a bi-directional long short-term memory layer and an RMSProp optimizer, however the detail and specificity of this architecture would result in very long training sessions for the models, and I needed something a little more rapid which can be iterated multiple times in a limited period of time. I experimented quite a bit with different architectures comparing and contrasting the results of different models, as evident from my latest blogs.

In addition to architecture, another most important part in the process of putting a good machine learning model is to implement the appropriate and necessary data (in this case text) pre-processing. In my pre-processing I chose to use and experiment with three different techniques and ended up using a combination of them.

Techniques and Text Pre-processing.

Removed Punctuation: Firstly I chose to rid each dataset that was loaded, from punctuation, this served multiple purposes, it minimised the size of the vocabulary and given that the model was based on the probability, and hence the number of times a word would appear in the text was very important, not removing punctuation would result in characters such commas and full stops having a very high probability of being predicted as a next word. Hence for the sake of consistence and better formed sentences which make more sense the project was better off without punctuation. Removing punctuation removed a lot of noise and therefore provided the model clarity.

Implemented Lemmatization: To implement lemmatization is to consider a language's full vocabulary and apply a morphological analysis to your dataset's words. Lemmatization groups together inflected forms of a word so that they can be analysed as a single word. After lemmatization "was" becomes "be" and "mice" becomes "mouse", therefore different words which may refer or mean the same thing are combined and as a result, this encourages a better varied output because there is less noise from a vocabulary perspective.

Stop-words: Stop words include commonly used words such as "the", "an" and "a". In trying to implement this as a pre-processing step before training, I used the nltk package to load the stop words for the English language. Upon implementing it and training a model on the resulting vocabulary, the results did not make sense, because in this case sentiment is very important and to remove stop words, was counterproductive to the goal I was trying to achieve, which is to make the output as believable and consistent from a grammar perspective as much as possible.

As a result, the pre-processing steps using for all trained models used to generate the tweets for In Memoriam, were Removing Punctuation and implementing Lemmatization.

Furthermore, I also went ahead and experimented with the size of the tweets by randomising it. I made sure to capitalize the first character of the first word of each tweet, and I also appended the seed as part of the actual tweet. The tweeting script is also set in such a way that it tweets once every max 10 minutes and the value of the interval time is generated randomly in a range of 0 to 10 minutes, if time is less than two minutes a status along with some media (image) is tweeted, otherwise only a status is tweeted.

Twitter Cron Job on AWS EC2

In order to mitigate having to run the code locally, I have deployed "In Memoriam" to run on an EC2 AWS. Because of this I intend to let this project continue to tweet for a long time, until I eventually decide to pick it back up in the hopes of refining it and building more models using more datasets from Daphne's blogs.


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Epoch 126/150
6839/6839 [=====] - 80s 12ms/sample - loss: 0.1762 - accuracy: 0.9534
Epoch 127/150
6839/6839 [=====] - 98s 14ms/sample - loss: 0.1624 - accuracy: 0.9573
Epoch 128/150
6839/6839 [=====] - 97s 14ms/sample - loss: 0.1681 - accuracy: 0.9567
Epoch 129/150
6839/6839 [=====] - 97s 14ms/sample - loss: 0.1424 - accuracy: 0.9627
Epoch 130/150
6839/6839 [=====] - 83s 12ms/sample - loss: 0.1312 - accuracy: 0.9643
Epoch 131/150
6839/6839 [=====] - 105s 15ms/sample - loss: 0.1181 - accuracy: 0.9667
Epoch 132/150
6839/6839 [=====] - 91s 13ms/sample - loss: 0.1106 - accuracy: 0.9690
Epoch 133/150
6839/6839 [=====] - 93s 14ms/sample - loss: 0.1040 - accuracy: 0.9721
Epoch 134/150
6839/6839 [=====] - 129s 19ms/sample - loss: 0.0928 - accuracy: 0.9770
Epoch 135/150
6839/6839 [=====] - 112s 16ms/sample - loss: 0.1044 - accuracy: 0.9765
Epoch 136/150
6839/6839 [=====] - 103s 15ms/sample - loss: 0.1112 - accuracy: 0.9683
Epoch 137/150
6839/6839 [=====] - 101s 15ms/sample - loss: 0.1201 - accuracy: 0.9665
Epoch 138/150
6839/6839 [=====] - 117s 17ms/sample - loss: 0.1485 - accuracy: 0.9617
Epoch 139/150
6839/6839 [=====] - 107s 16ms/sample - loss: 0.1487 - accuracy: 0.9586
Epoch 140/150
6839/6839 [=====] - 113s 17ms/sample - loss: 0.1370 - accuracy: 0.9596
Epoch 141/150
6839/6839 [=====] - 125s 18ms/sample - loss: 0.1663 - accuracy: 0.9563
Epoch 142/150
6839/6839 [=====] - 130s 19ms/sample - loss: 0.1570 - accuracy: 0.9588
Epoch 143/150
6839/6839 [=====] - 122s 18ms/sample - loss: 0.4351 - accuracy: 0.8849
Epoch 144/150
6839/6839 [=====] - 143s 21ms/sample - loss: 0.2884 - accuracy: 0.9200
Epoch 145/150
6839/6839 [=====] - 130s 19ms/sample - loss: 0.1728 - accuracy: 0.9525
Epoch 146/150
6839/6839 [=====] - 125s 18ms/sample - loss: 0.1252 - accuracy: 0.9662
Epoch 147/150
6839/6839 [=====] - 115s 17ms/sample - loss: 0.1119 - accuracy: 0.9712
Epoch 148/150
6839/6839 [=====] - 111s 16ms/sample - loss: 0.0720 - accuracy: 0.9808
Epoch 149/150
6839/6839 [=====] - 109s 16ms/sample - loss: 0.0700 - accuracy: 0.9825
Epoch 150/150
6839/6839 [=====] - 91s 13ms/sample - loss: 0.0617 - accuracy: 0.9860

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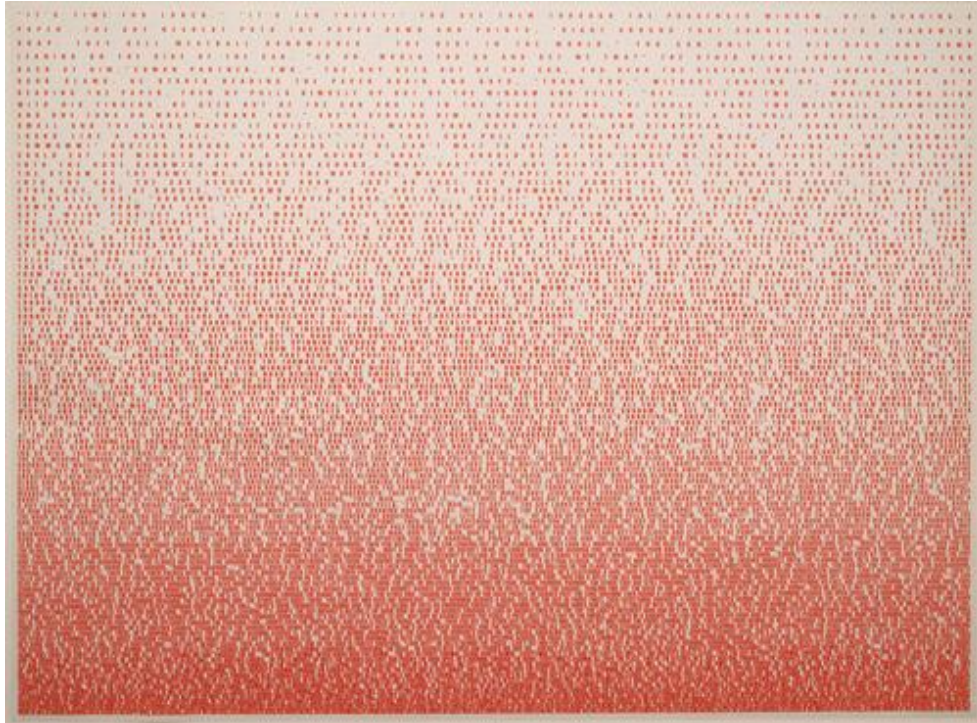
Final trained model statistics output in training.

Inspirations and Research

Robert Smithson: Having written a critical studies essay about Robert Smithson in one of my second-year seminars, I found myself recalling upon Smithson's idea of the monument, and how this could manifest itself in my project. In his essay piece, *Monuments of Passaic* he uses words to paint a vivid picture, to take you there with him on his walk/journey.

Bruce Nauman: I was looking at a lot of Bruce Nauman physical space limitations work at the time where the prospect of an exhibition was still high. I was trying to think of a way to use the space, to make it more interesting for the audience to explore the generated texts as opposed to blankly staring at a wall. I think the idea has still to an extent reflected on using twitter as an exhibition space, the audience are now free to either fully immerse themselves by visiting the profile and taking the journey from the first tweet up till now, or they can simply follow the account and be progressively introduced to the concepts of *In Memoriam*, so to a certain extent I think there is still a play on space here, virtual space let's say that.

Fiona Banner: I was introduced to Fiona Banner's work through a friend and colleague. Fiona's use of text as a visual medium of interpretation was very inspiring because by words, she put you smack in the middle of what is happening. I was primarily looking at Fiona's works to take some cues as to how I could display my generated text in a physical exhibition space.



Point Break, Fiona Banner 1998

Jenny Holzer: I am very interested in Jenny Holzer's use of public spaces, it is almost like a broadcast, the works demand that you stop what you are doing and watch and listen and pay attention. I really like that aspect of her work, and I guess hosting In Memoriam on Twitter echoes the same idea because the scope of opportunities for exposure and broadcasting a message over twitter, or any other social media network for the matter are almost limitless.



Abuse of power comes as no surprise, Jenny Holzer, 1980

1984, George Orwell: Orwell's terrifying accounts of a post-democratic world are eye-opening to say the least and gave me lots of courage to see this project to a start, a good one, I hope. As I have iterated earlier Daphne's fight against corruption and politicians colluding with criminals now falls in the hands of the people, and I think we all have the responsibility to continue where she left off.

Ruzar Briffa, *Jum ir-Rebh*: Coming back to Malta to live temporarily I have been reading a lot of Maltese literature, and this is a poem that everyone knows in Malta and that is rather sentimental, almost like a second national anthem to an extent. The author was inspired to write the poem after attending a football match in 1945 where the Maltese team was playing the Yugoslavian team. At the start of the match the English (Malta a colony) and Yugoslavian National Anthem were sung with no regard for the Maltese National Anthem. In protest the Maltese crowd stood up and sang the Maltese National Anthem. The way in which this ties to the project, is because although the lyrics of the poem relate to that incident, they are reflective of the sentiment of Maltese civil society at the incumbent government in the recent years since the assassination of Daphne Caruana Galizia, this especially reflected in the case of the lyric "Miskin min ikasbarni, miskin min jidhak bija" which translates to "Sorry will be those who act badly in my name, and who lie and manipulate me".

Concluding.

Putting this project has been a learning experience and also one which was rather familiar thanks to previous projects I had put together. My personal project blog served as a good train of thought which I could always refer back to. Even in putting this final project report together, having blogged all throughout the work in progress phase it makes it so much easier to recall back on the project, its inspirations, its difficulties and its eureka moments. I am very proud that my 3-year degree at Goldsmiths culminated into a passionate personal project with meaning, with an intention to revive and to keep Daphne's flame alight for a long time.

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