**Work overview:**

The European Parliament holds a key role in the legislative process of the European Union. It discusses, negotiates and votes on legislation put forwards by the European Commission. The parliament is composed of 751 members (MEPs) who represent the 28 member states of the European Union.

I plan to analyse the influence of Members of the European Parliament’s (MEP) social networks on the outcome of their votes on a motion in the European Parliament. I would like to infer “unknown influences” on these MEPs which cause them to vote in unexpected ways and potentially visualise the results of my analyses. The project could ultimately predict future votes by matching shared characteristics between MEPs.

I am thinking of analysing the outcome of the Directive on Copyright in the Digital Single Market from a publicly available spreadsheet of vote results. (Existing dataset includes: First & Last names, votes, European-level political groups, National-level political groups, Jurisdiction, Country of origin, EP webpage, twitter handle (if applicable))

I am hoping to achieve a series of measures which will hopefully indicate why particular MEPs vote in ways which were not otherwise predictable, leading to the possibility of predicting future votes from combinations of those characteristics. Completing this project will necessitate a combination of social network analysis, graph theory and probability.

**Technologies and Materials:**

I plan on using Python for most of the work. It seems a particularly good choice for its wide range of supporting libraries and excellent documentation. I will source data from European Parliament websites with pre-constructed datasets as well as collecting data myself by using social media APIs. I intend to construct and analyse the data using Pandas and NumPy, construct social networks using NetworkX, a Python package for graph theory and predict future votes with Machine Learning techniques using TensorFlow.

* Twitter API library ([here](https://www.tweepy.org/))
* Tensorflow ([here](https://www.tensorflow.org/))
* NetworkX ([here](https://networkx.github.io/documentation/latest/tutorial.html))
* Pandas ([here](https://pandas.pydata.org)) & NumPy ([here](https://numpy.org/))

**Motivation research:**

* Demonstrate what is inspiring your work
  1. My personal interest in politics and the systems behind passing legislation. I was raised by two Europhiles, one of them working in the EC. I would like to expand my knowledge of the European Parliament as well as working on a technically challenging project.
  2. *we choose representatives because they say we share the same point of view, if they vote otherwise, this is where the absence of transparency is hurtful*

Social Networks in Policy Making (<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=2ahUKEwi8vLHIo63lAhWfQkEAHUDIB28QFjACegQIARAC&url=https%3A%2F%2Fpeople.as.cornell.edu%2Fsites%2Fpeople%2Ffiles%2FBattaglini%2520and%2520Patacchini_25Jan2019%2520%25281%2529_3.pdf&usg=AOvVaw39lbo4ZSJ2gZoIkhsU52zc>)

U.S. Senators’ Social Network Analysis Based on Twitter(<https://towardsdatascience.com/u-s-senators-social-network-analysis-based-on-twitter-147a5df968c7>)

European Transparency Register(<https://ec.europa.eu/transparencyregister/public/homePage.do>)

Directive on Copyright in the Digital Single Market vote results(<https://saveyourinternet.eu/wp-content/uploads/2019/03/EP-2019-Plenary-Vote-Outcome.xlsx>)

**Existing knowledge:**

I will draw on Python experience from my 1st year module Problem solving for Computer Science. I will make use of my past studies in 2nd year Algorithms and Data Structures as well as my current 3rd year module Advanced Algorithms and Data Structures for the graph theory and probability in my project. I will also rely on my 3rd year Neural Networks, Machine Learning and Data Mining modules for the completion of this project.

**New knowledge:**

I will need to gain knowledge of data collection, particularly extracting data from social media APIs and rendering it useful through manipulation. This project will also require me to learn about Social Network Analysis, Graph Theory, Probability and Machine Learning. I will acquire some of these skills from my current modules but will likely need to explore the others more in depth using mainly resources found online.

* How you will acquire these skills? Put links to online resources, cite books etc.

**Timeline and milestones:**

My project will be stored on Github at : <https://github.com/TristanThomson/Year-3-Final-Project>

* Include as much detail as possible.
* Be specific about what you will research when and what parts of your code and piece you will build when

MVP: Data collection, establishing social influence networks around “key rebel” MEPs, defining metrics to use for weighting the edges between individuals Data Visualisation.

Extension 1: Using probability to infer other influences acting on the MEPs’ voting.

Extension 2: Prediction based on known data using Machine Learning techniques.

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| **Week Monday** | **Topic** | **Milestone** |
| 30/09/2019 |  | Ideation Submission |
| 07/10/2019 | Planning & research |  |
| 14/10/2019 | Planning & research |  |
| 21/10/2019 | Planning & research |  |
| 28/10/2019 | Concept validation | Project Specification Submission |
| 04/11/2019 | Data Collection |  |
| 11/11/2019 | Data Collection |  |
| 18/11/2019 | Finding key rebel MEPs |  |
| 25/11/2019 | Finding metrics for SNA |  |
| 02/12/2019 |  |  |
| 09/12/2019 |  |  |
| 16/12/2019 |  |  |
| 23/12/2019 |  |  |
| 30/12/2019 |  |  |
| 06/01/2020 |  |  |
| 13/01/2020 |  | Interim Project Report |
| 20/01/2020 |  |  |
| 27/01/2020 |  |  |
| 03/02/2020 |  |  |
| 10/02/2020 |  |  |
| 17/02/2020 |  |  |
| 24/02/2020 |  |  |
| 02/03/2020 |  |  |
| 09/03/2020 |  |  |
| 16/03/2020 |  |  |
| 23/03/2020 |  | Draft report submission |
| 30/03/2020 |  |  |
| 06/04/2020 |  |  |
| 13/04/2020 |  |  |
| 20/04/2020 |  |  |
| 27/04/2020 |  |  |
| 04/05/2020 |  |  |
| 11/05/2020 |  |  |
| 18/05/2020 |  | Final report submission |