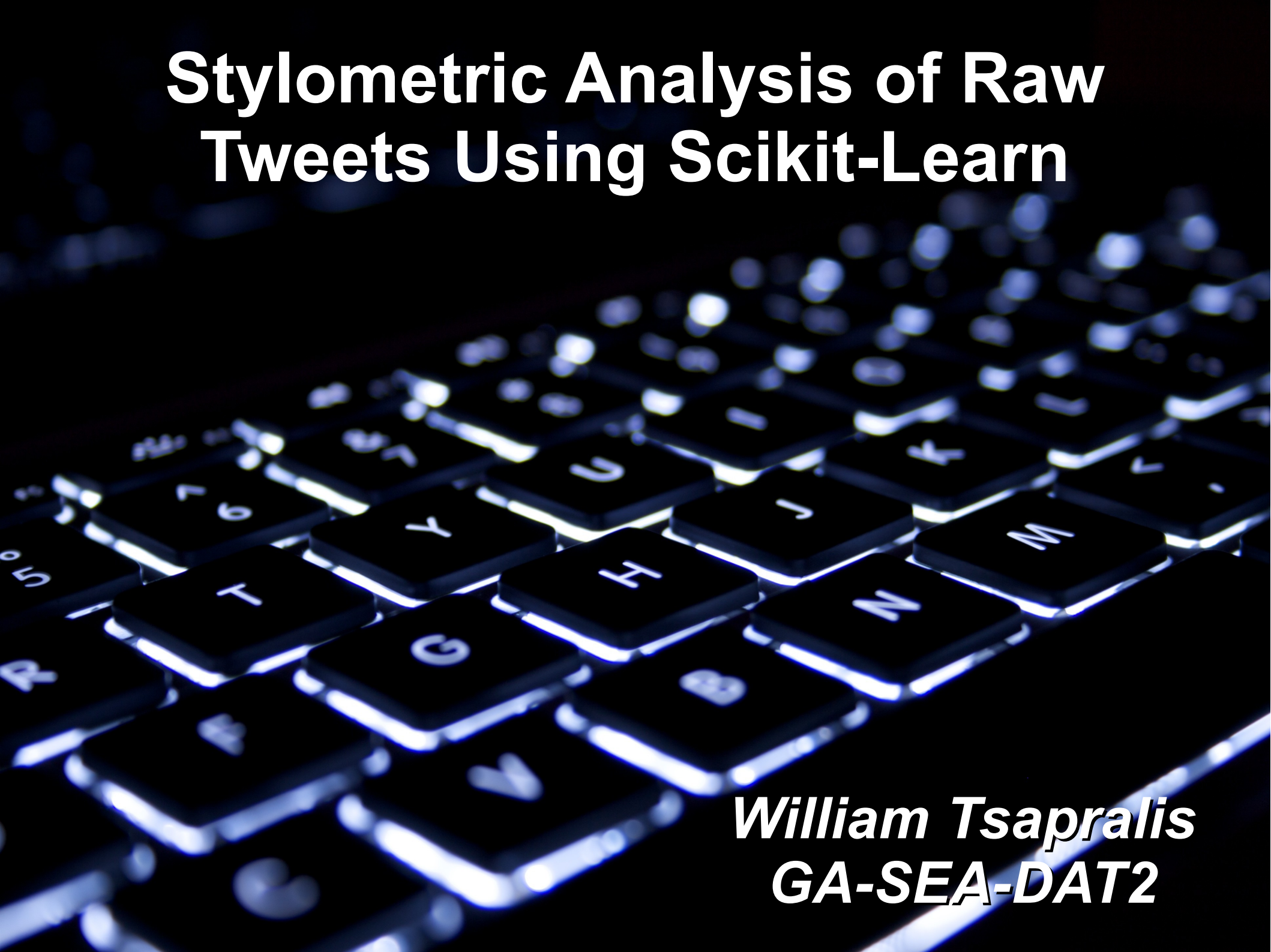
Stylometric Analysis of Raw Tweets Using Scikit-Learn



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What is Stylometry?

- **The Problem:** Identifying authorship of text through analysis of *writer invariants.*
- **Writer Invariants** are *features* of text passages from the same author that...
  - Are statistically unique to the same author
  - Remain largely unchanged throughout text
- **Features** that may help identify invariants:
  - **Numeric:** *Average sentence length, syllables, etc*
  - **Synonyms:** *Word choice, use of contractions, etc*
  - **Punctuation:** *Comma, semicolon, or hyphen use*

The Question(s)

- **In the absence of usernames, what *features* can we best identify tweet authorship with?**
- **Are there features characteristic to tweets that make them easier to attribute?**

- **Hypothesis:** Despite the 140-character limit, tweets may have other useful invariants:
  - *Frequency of **link usage**, which **domains***
  - *If added text is placed before/after links*
  - *Hashtag usage, response to other users*

The Data

- **Source:** Acquire tweets in CSV form for model. I have chosen to use feeds of all US senators.
- **Quantity:** Current research indicates that *five-thousand words* is point of diminishing returns. Given Twitter's 140 character limit, I suspect *five-hundred* tweets per senator will suffice.
- **Wrangling:** The CSV files of the Tweets must be organized in a way that makes feature engineering easy to do. I may need to revist this step based on the features I hope to use.

The Modeling

- **Logistic Regression:** Data is not numerically continuous, each tweet set must be categorized
- **First:** Analyze twitter feed by chosen features.
- **Next:** Choose which features best distinguish one feed from another, much iteration...
- **Final:** Gather a subset of new tweets from previously selected feeds (ten or so), remove the user handles, and use model to attribute.

Example: Syllable Count

- To be used in Jupyter:

```
773
774  def syllables(word):
775      count = 0
776      vowels = 'aeiouy'
777      word = word.lower().strip(".:;?!")
778      if word[0] in vowels:
779          count +=1
780      for index in range(1,len(word)):
781          if word[index] in vowels and word[index-1] not in vowels:
782              count +=1
783      if word.endswith('e'):
784          count -= 1
785      if word.endswith('le'):
786          count+=1
787      if count == 0:
788          count +=1
789      return count
```

What Now?

- **Coding:** Python code such as what you saw will be ported into a Jupyter notebook.
- **Data Acquisition:** Scraping tools allow for more tweets, API via Twython is kind of limited…
- **Build the Model:** Of all notebooks we've run, this project is most similar to the Bank analysis
- **Gather New Tweets:** These will have names removed, and my hope is to build a model that will attribute tweet source to the right senator.