

# Math 404 Winter Project Proposal

**Project Members:** Tanner Wallace, William Terry, Matthew Daw, Riley Gabrielson, Daniel Christensen

**What will the project be:** Language Learning Optimization for the Book of Mormon

**Questions we will answer:**

- What words are the most beneficial for a user's current learning of a foreign book of mormon. Our target audience for this model is new missionaries learning to read a foreign Book of Mormon, and we want to optimize the learning process so they can most effectively learn their assigned language.

**Data sets:**

- Possible collection from service missionaries thanks to the resources offered to us via Matthew Daw through the Church of Jesus Christ of Latter-day Saints.
- Web scraping language translations of the Book of Mormon
  - Inherent cleaning with removing the footnote markers and numbers
  - Additionally, we need to map words to their translation as best we can, as well as differentiate between proper nouns
- Artificial Learner, used to initially test our model against hyper parameters.
  - Besides the natural time series that are present in any text, we are most interested in the sequence of words that a user is learning, how long it has been since a user has been exposed to a certain word, and what words are similar to each other.

**Techniques you think you will use:**

- Hidden Markov Models
- Time series analysis that we will learn later in the semester
- Kalman Filters
- ARIMA models
- Clustering

**Metrics:**

- Post model validation via user testing
- Memorization speed/quantity
- Retention

**How will you divide the work:**

Riley- Web scraping different Book of Mormon translations, help with Data Cleaning

Matthew- Interfacing with the Church's developers, Language Learning research

Daniel- Pseudo Testing via Artificial Learner

Tanner- Project Management (includes collecting data from other team members, deadlines, synthesis, source collection)

Will- Data Cleaning/Management. Language synthesis and translation.