1135-I1-1140 **Shirley L Yap*** (shirley.yap@csueastbay.edu). *Vector Space Embeddings of Words.* Preliminary report.

As part of the PIC Math program, I worked with a team of students and the natural language processing company First Rain, to use artificial neural networks to help them model their documents. Artificial neural networks are machine learning models mimicking the behavior of axons in a biological brain. Neurons are organized in layers, with weights between each layer that control how connected one neuron is to another. Neural networks are a supervised learning system, where inputs are fed into a system with known outputs. When inputs are entered into the network, the outputs will result in an error function, which is minimized via gradient descent. Neural networks are powerful modeling systems so that even a two layers network can represent any bounded continuous function within an arbitrary degree of accuracy. In this project, we applied a neural network to a natural language processing problem. Specifically, we fed hundreds of thousands of text documents into a neural network in order to find synonyms for given glossaries. Our particular focus was to find the optimal embedding space dimension for the embedding space of the words (Received September 19, 2017)