



**University
of Victoria**

Graduate Studies

**Notice of the Final Oral Examination
for the Degree of Doctor of Philosophy**

of

COLE PETERSON

BSc (University of Victoria, 2016)

“Generating Rhyming Poetry Using LSTM Recurrent Neural Networks”

Department of Computer Science

Friday, March 29, 2019
9:30 A.M.
Engineering and Computer Science Building
Room 468

Supervisory Committee:

Dr. Alona Fyshe, Department of Computer Science, University of Victoria (Supervisor)
Dr. Nishant Mehta, Department of Computer Science, UVic (Member)

External Examiner:

Dr. Jackie Cheung, Department of Computer Science, McGill University

Chair of Oral Examination:

Dr. Monica Prendergast, Department of Curriculum and Instruction, UVic

Abstract

Current approaches to generating rhyming English poetry with a neural network involve constraining output to enforce the condition of rhyme. We investigate whether this approach is necessary, or if recurrent neural networks can learn rhyme patterns on their own. We compile a new dataset of amateur poetry which allows rhyme to be learned without external constraints because of the dataset's size and high frequency of rhymes. We then evaluate models trained on the new dataset using a novel framework that automatically measures the system's knowledge of poetic form and generalizability. We find that our trained model is able to generalize the pattern of rhyme, generate rhymes unseen in the training data, and also that the learned word embeddings for rhyming sets of words are linearly separable. Our model generates a couplet which rhymes 68.15% of the time; this is the first time that a recurrent neural network has been shown to generate rhyming poetry a high percentage of the time. Additionally, we show that crowd-source workers can only distinguish between our generated couplets and couplets from our dataset 63.3% of the time, indicating that our model generates poetry with coherency, semantic meaning, and fluency comparable to couplets written by humans.