Our report was originally written as part of the CSC143H5-Neural Networks and Deep Learning Final Project. The developed tool was a deep learning model that can serve as a cooking assistant in our everyday cooking. Whether it is seeking inspiration for culinary pursuits or trying to make a satisfying meal with some leftover ingredients in the refrigerator, deciding what to cook is a common dilemma. We built this recipe generator tool to serve as a practical solution to our recurrent confusion of what to cook. We see this project as a lifesaver for anyone and everyone who cooks.

The model's objective is to generate novel recipes based on user-provided ingredients, serving as a dependable kitchen assistant to simplify everyday cooking for anyone and everyone who cooks. We designed and developed a Sequence-to-Sequence Encoder-Decoder recurrent Neural Network that would generate a recipe based on user-given ingredients.

In recent years, tools like food or ingredient detection, or recipe recommendation have received increasing attention. However, most of them use object detection and/or classification to recommend/generate recipes (Rokon et al.,2022). Some recipe recommendation systems have excelled in providing personalized suggestions based on individual preferences, dietary restrictions, and available ingredients. However, they often fall short in ensuring good representativeness of various cuisines. An example of one such recipe recommendation model is the attention-based convolutional neural network proposed by Jia et al. (2022). While it provides tailored suggestions by learning the user-preference of the ingredients; the model's architecture is built to parse mainly recipes from Chinese cuisine (Jia et al., 2022). Such models will not perform well for recipes of a different language or cuisine. Lastly, while there are models that can conduct text-based recipe retrieval (Wang et al., 2008), there is not any research in the

culinary domain that utilises Sequence-to-Sequence (seq2seq) models to generate recipes given a sequence of ingredients.

To address this gap, the paper proposes the development of a seq2seq Recurrent Neural Network (RNN) model trained on a more comprehensive dataset. The report outlines the steps we took to design, validate, and test this model. It also outlines the results of this experimental model and the next steps that can be taken to further refine this model.

References

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