User Session based RNN and GRU Recommendation Engine

Project Proposal

BATCH 2019

A project submitted in partial fulfilment of the
FAST University Deep Learning semester subject
Of
MS Data Science

National University
of computer and emerging sciences

Department of Computer Science

National University of Computer and Emerging Sciences,
City Campus, Karachi

19 March 2021

Project Registration

Project ID (for office use)						
Type (Nature of project)	[✓] **D**evelopment [✓] **R**esearch [✓] **R&D**					
Area of specialization	Deep learning specialization					
Project Group Members						
Sr.#	Reg. #	Student Name	CGPA	Email ID	Phone #	Signature
(i)	19K-1612	Muhammad Qasim	2.3	K191612@nu.edu.pk	0315-2968211	
(ii)		Fareed				
(iii)						
Name & Signature of Batch Advisor (If students are eligible for FYP)						

Abstract

According to Mckinsey global institute, till 2030 we will raise $13 Trillion [1] dollar profit in Artificial Intelligence. In particular Retail industries we will also generate $ 0.08T dollar profit. That's why we selected one of the important machine learning problems "Recommendation Engine" through this specific field we can totally transform many Electronic-Businesses(EB). It will be really improved to sell any types of products with a customer centric approach. We will try to combine some advance Machine Learning (Collaborative Filtering, users vs items similarity factorization matrix) Deep learning (RNN-LSTM) techniques to solve this problem.

Introduction

Due to advancement of deep learning we know about RNN this is subtype of network ANN performed very well on Sequential data (Time Series data, Text, stock exchange historical data) and also know about LSTM (long short term memory) good performed with together these two techniques performed well on session based recommendation engine [2]. LSTM is a technique that we can use in RNN where this algorithm decides which value should be memorized or which value should be removed. This is responsible for maintaining all properties are Gated Recurrent Units [3]. Collaborative filtering also a good performance on item vs user matrix distance but there is a cold-start problem.

References:

[1]. $13 Trillion Dollar

[2]. Hidasi, B., Quadrana, M., Karatzoglou, A., & Tikk, D. (2016, September). Parallel recurrent neural network architectures for feature-rich session-based recommendations. In *Proceedings of the 10th ACM conference on recommender systems* (pp. 241-248).

[3] Hidasi, B., Karatzoglou, A., Baltrunas, L., & Tikk, D. (2015). Session-based recommendations with recurrent neural networks. arXiv preprint arXiv:1511.06939.