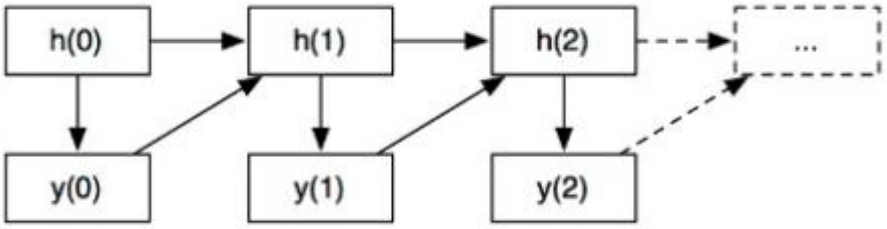
Novel approaches to Recommendation2

https://www.youtube.com/watch?v=mRToFXlNBpQ&feature=youtu.be
https://www.slideshare.net/xamat/recommender-systems-machine-learning-summer-school-2014-cmu

Deep Learning for Collaborative Filtering



Playlist 예측에 RNN모델이 어떻게 사용 될 지 살펴보자. Playlist data는 영화 데이터(Ranking data) 달리 순차적(sequence)인 데이터이다. 추후에 어떤 음악을 들을지 예측하는 모델이다.

- We assume $P(y_i|h_i)$ is a normal distribution, log-likelihood of the loss is just the (negative) L2 loss: $-(y_t - h_t)^2$
- We can specify that $h_{i+1} = \tanh(U y_i + V h_i)$ and that $h_0 = 0$
  - Model is now completely specified and we have $3k^2$ unknown parameters
  - Find U, V, and W to maximize log likelihood over all examples using backpropagation

$$\log L = \sum_{\text{all examples}} \left(\sum_{i=0}^{t-1} -(y_i - h_i)^2 \right)$$

- In order to predict the next track or movie a user is going to watch, we need to define a distribution $P(y_i|h_i)$
  - If we choose Softmax as it is common practice, we get:

$$P(y_i|h_i) = \frac{\exp(h_t^T a_j)}{\sum_k \exp(h_t^T a_k)}$$

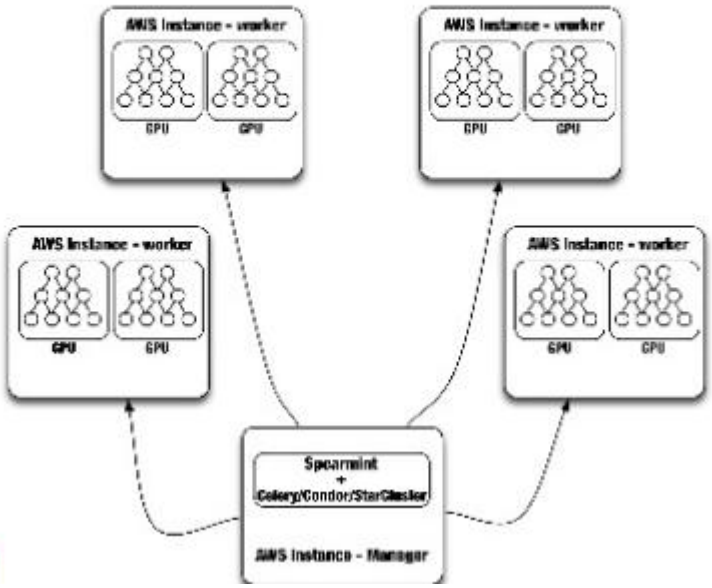
    - Problem: denominator (over all examples is very expensive to compute)
    - Solution: build a tree that implements a hierarchical softmax

- More details on the blogpost

ANN Training over GPUS and AWS

- How did we implement our ANN solution at Netflix?

http://techblog.netflix.com/2014/02/distributed-neural-networks-with-gpus.html



Neural net으로 train과 optimize하기 어려운 많은 hyper parameter를 가지고 있다면 어떻게 할 것인가?

여러 GPU에서 Neural network 이용하여 Optimize를 잘 할 수 있는 hyper parameter 찾는다

Similarity

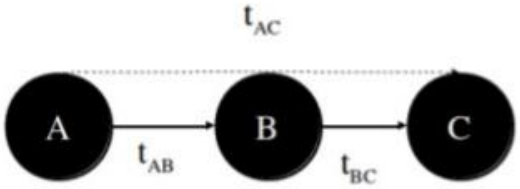
Silmilarity의 정의는 다양한 방법으로 내릴 수 있다. Metadata/tags, user play behavior, rating behavior. 각각의 silmliarity를 모델을 학습할 때 쓴다.

Social Recommendations

-사람들 간의 Implicit connection를 이용해 최종적인 trust를 찾아낸다.
-사전적인 의미의 trust가 아니라 user로부터 얼마나 recommandation을 믿을 수 있는가? 라는 의미

Trust Inference

The Goal: Select two individuals - the *source* (node A) and *sink* (node C) - and recommend to the source how much to trust the sink.



-B는 얼마나 A를 Trust할 수 있는가? A와C가 직접적인 연결이 없을 때는 어떻게 할 것 인가?
-자세한 것은 논문을 통해.. Advogato(Levien), Appleseed(Ziegler and Lausen), MoleTrust (Massa and Avesani), TidalTrust (Golbeck)