

7-4: FunkSVD Training Algorithm

Introduction to Recommender Systems

Introduction to Recommender Systems

Algorithm Structure

```
initialize matrices
for f in features:
    until feature has converged:
        for (u,i,r) in ratings:
            predict r
        update user, item values for f
```

Introduction to Recommender Systems

Introduction

- Last lecture discussed learning SVDs with gradient descent
- This video: more details on the training process
 - Walk through pseudocode

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Prediction/Scoring

- Dot product of user, item vectors
 - All items: multiply user vector by item matrix

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7-4: FunkSVD Training Algorithm

Train-FunkSVD m users
n items
k features

$U \leftarrow m \times k$ matrix Fill w/ 0.1 $R \approx U V^T$
 $V \leftarrow n \times k$ matrix

for $f \leftarrow 1 \dots k$:
 until convergence:
 for $r_{ai} \leftarrow$ ratings:
 $p_{ai} \leftarrow$ predict r_{ai} learning rate
 $\epsilon_{ai} = r_{ai} - p_{ai}$ reg. term
 $u_{af} \leftarrow$ update $\Delta u_{af} = \lambda (\epsilon_{ai} v_{if} + \frac{1}{2} u_{af})$
 $v_{if} \leftarrow$ update $\Delta v_{if} = \lambda (\epsilon_{ai} u_{af} - \frac{1}{2} v_{if})$