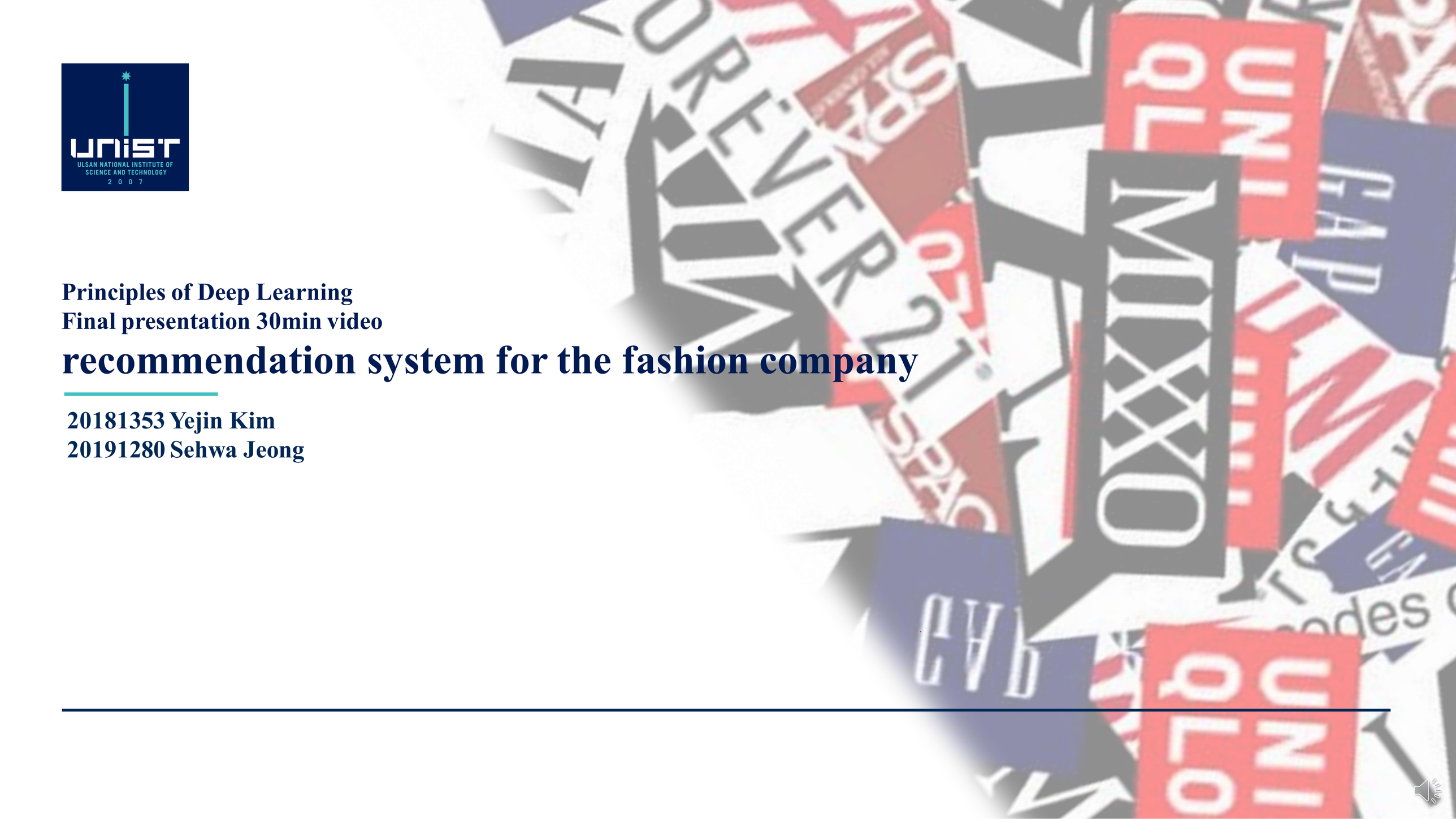


Principles of Deep Learning
Final presentation 30min video

recommendation system for the fashion company

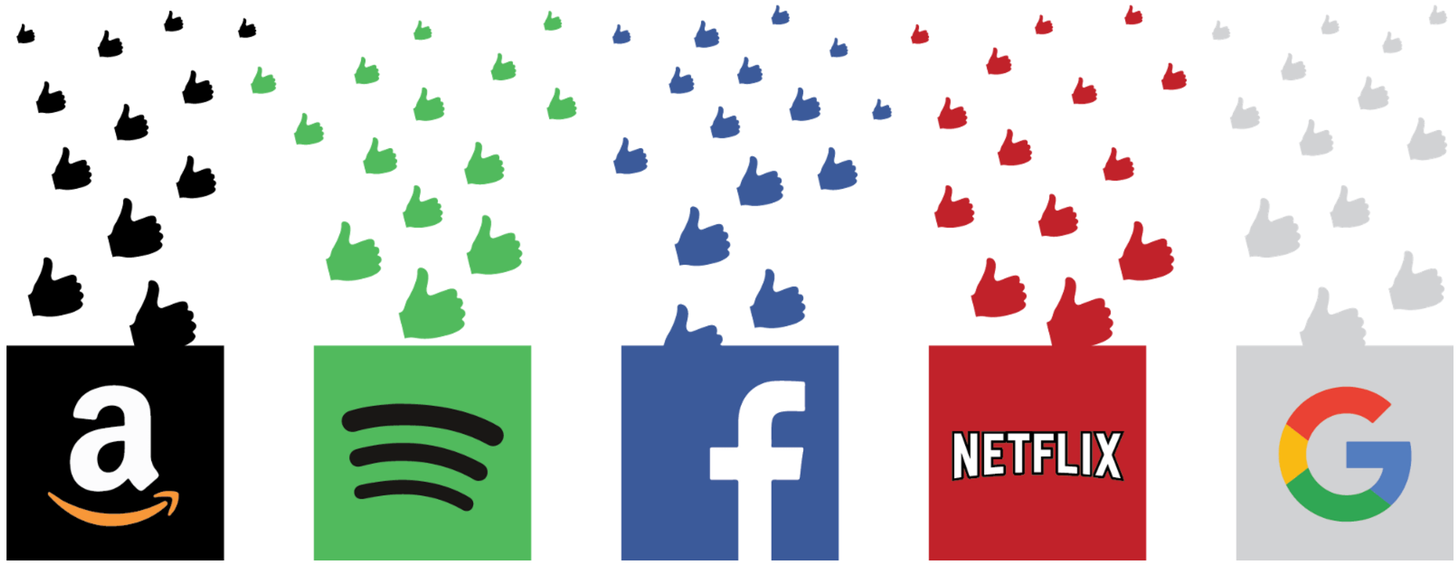
20181353 Yejin Kim
20191280 Sehwa Jeong

CONTENTS

1. Introduction

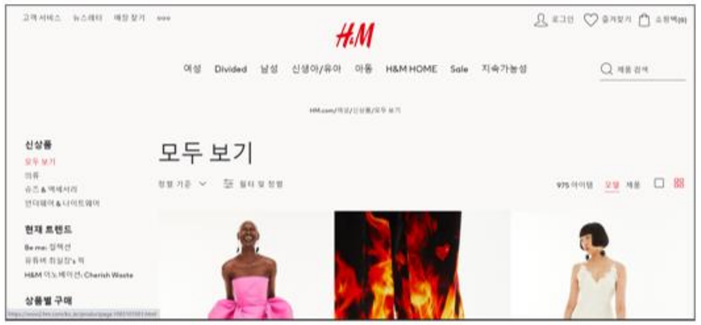
Recommendation system

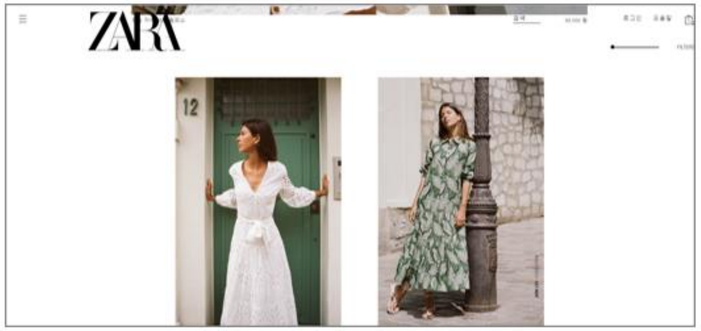
: system that provides personalized recommendations to users.

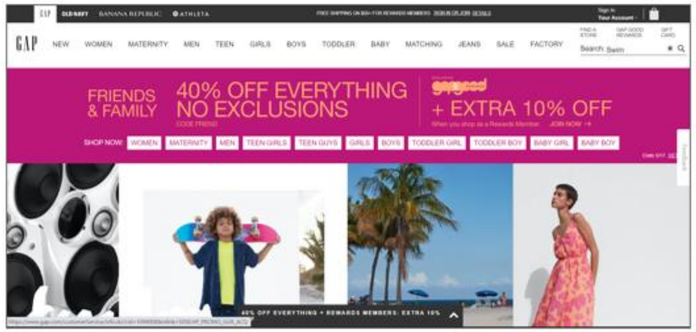


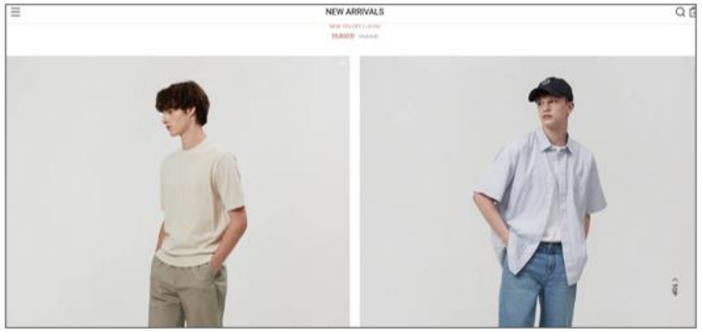
1. Introduction

“ Fashion company especially in online market ”





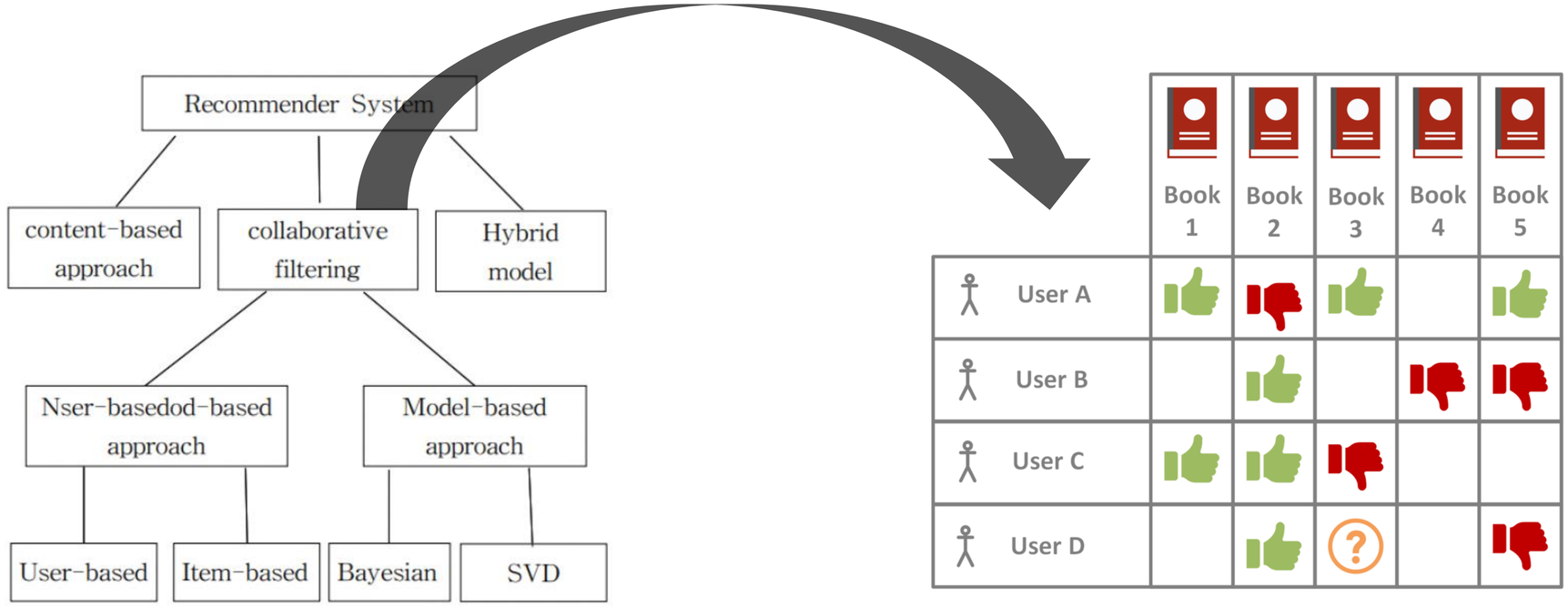




1. Introduction

▯ Problem

1. It is different from the conventional recommendation system method !



1. Introduction

▯ Problem

2. Data are too diverse !!

images

languages

Jersey top with narrow shoulder straps.	Microfibre T-shirt bra with underwired, moulded, lightly padded cups that shape the bust and provide...	Semi shiny nylon stockings with a wide, reinforced trim at the top. Use with a suspender belt. 20 de...

others

brand (“Levi’s”),
silhouette (“jeans”),
physical properties like shape (“slim cut”), color (“blue”),
material (“stonewashed cotton denim”),
target groups (“adult,” “male”),
price,
customer and expert sentiments

.
.

1. Introduction

Problem

3. users' preferences, product styles and trends change over time !!!

2021 summer trends

2022 summer trends

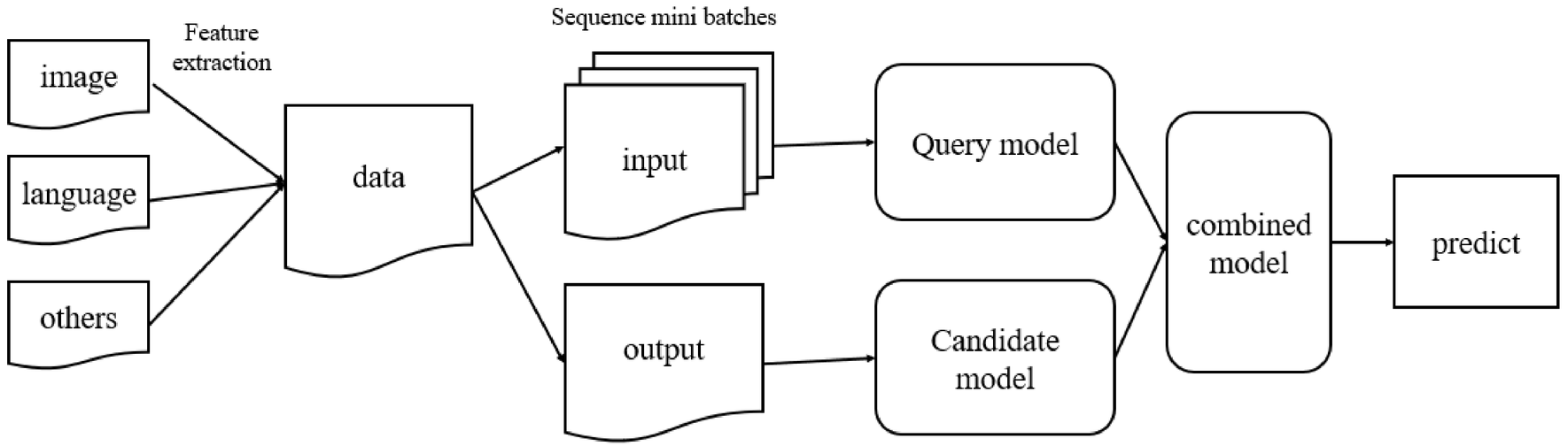
1. Introduction

Problem

“predict the items that a customer will buy in the next purchasing”

Architecture

FOR-system(Fashion Online Recommendation-system)

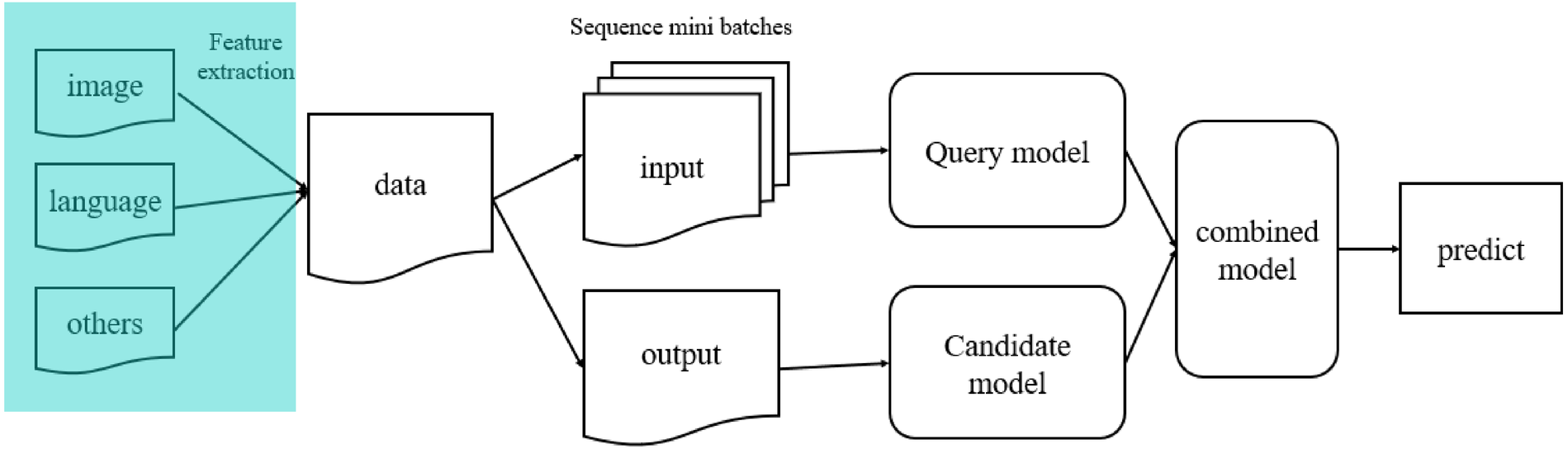


2. Model Design and Architecture

2.1 Feature extraction

2.1.1 image

2.1.2 Language



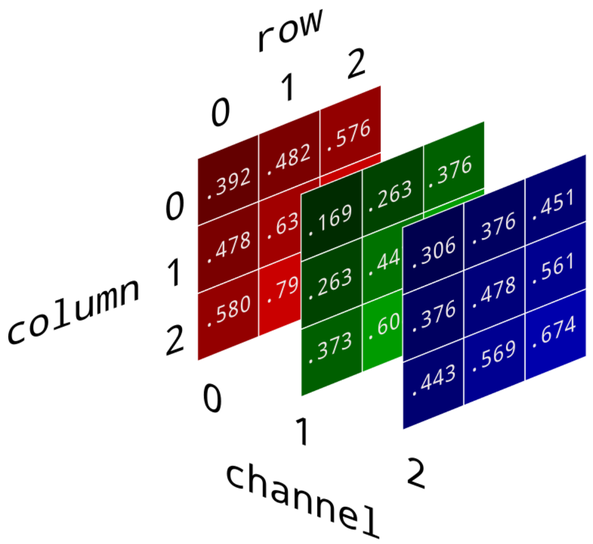
2. Model Design and Architecture

2.1 Feature extraction 2.1.1 image

2. Model Design and Architecture

2.1 Feature extraction 2.1.1 image

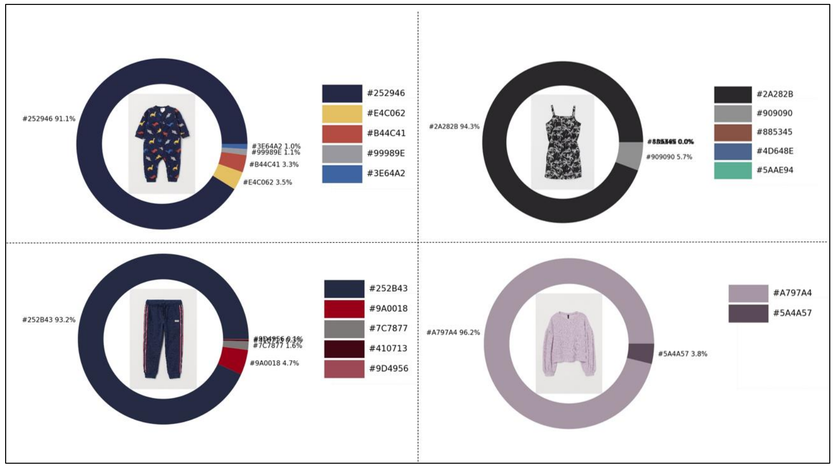
color



Grid of pixels

#FF0000	RGB (255, 0, 0)
#FF7F00	RGB (255, 127, 0)
#FFFF00	RGB (255, 255, 0)
#FFFF00	RGB (0, 255, 0)
#0000FF	RGB (0, 0, 255)
#4B0082	RGB (75, 0, 130)
#8F00FF	RGB (143, 0, 255)

Convert RGB into HEX code



Extract color

Parameter : Tolerance, limits

2. Model Design and Architecture

2.1 Feature extraction 2.1.1 image

shape

Sobel Filter

-1	0	+1
-2	0	+2
-1	0	+1

X filter

+1	+2	+1
0	0	0
-1	-2	-1

Y filter

Scharr Filter

+3	0	-3
+10	0	-10
+3	0	-3

X filter

+3	+10	+3
0	0	0
-3	-10	-3

Y filter

Prewitt Filter

-1	0	+1
-1	0	+1
-1	0	+1

X filter

+1	+1	+1
0	0	0
-1	-1	-1

Y filter

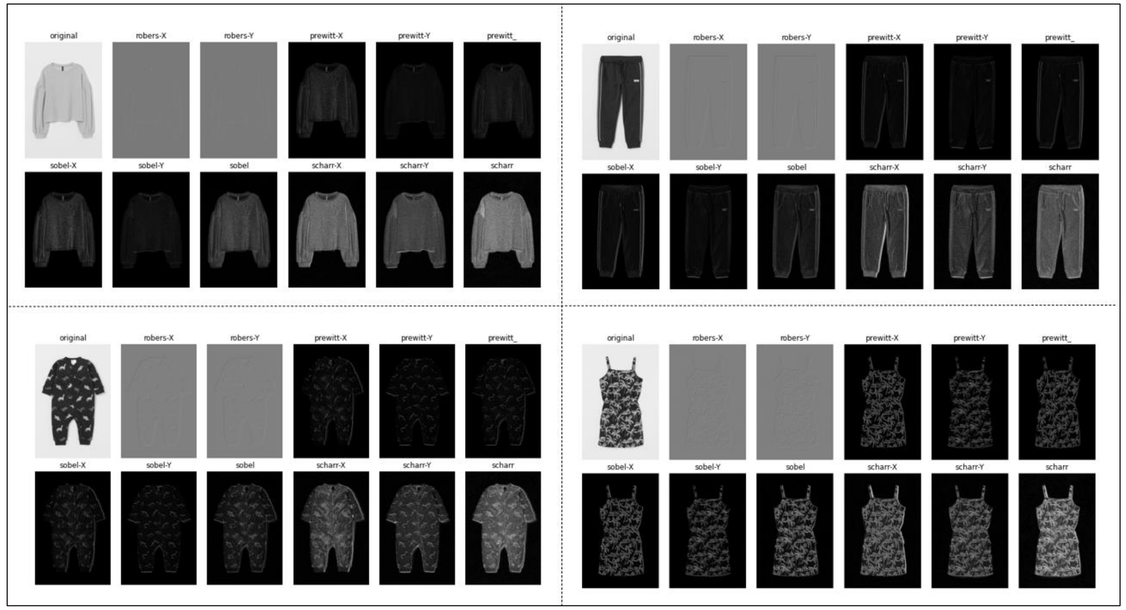
Roberts Filter

+1	0
0	-1

X filter

0	+1
-1	0

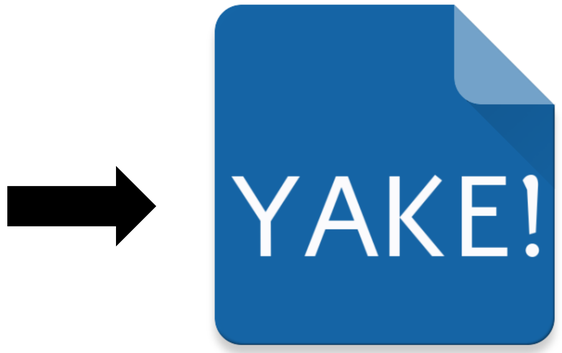
Y filter



2. Model Design and Architecture

2.1 Feature extraction 2.1.2 Language

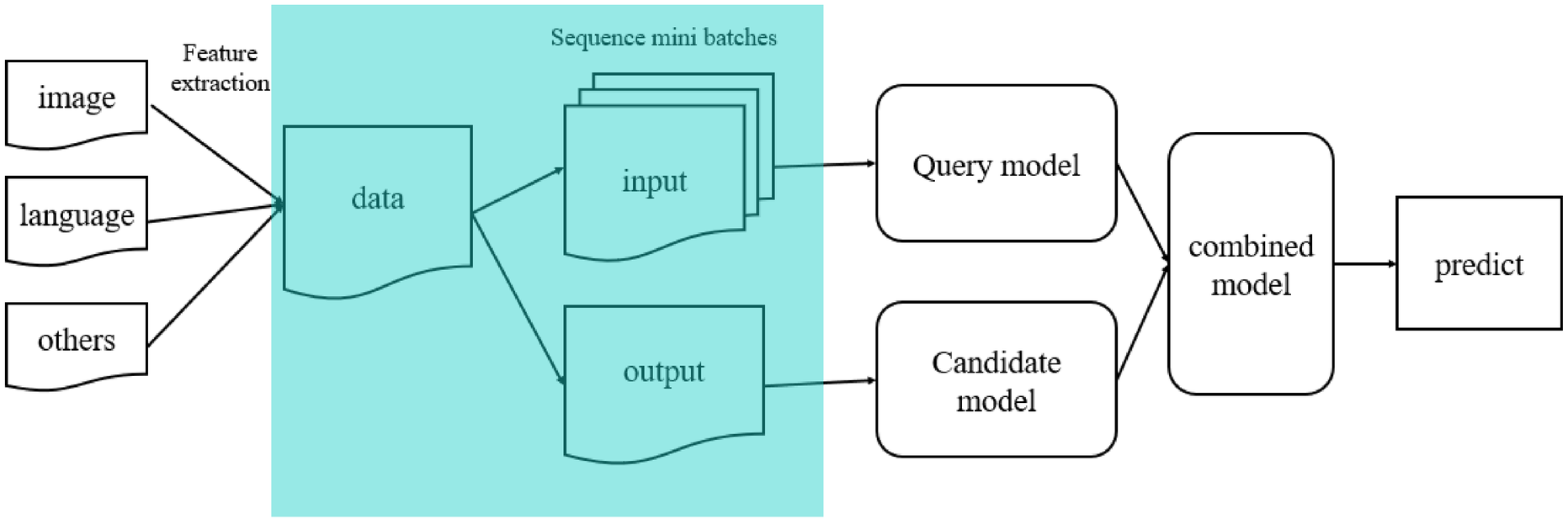
detail_desc
Jersey top with narrow shoulder straps.
Jersey top with narrow shoulder straps.
Jersey top with narrow shoulder straps.
Microfibre T-shirt bra with underwired, r
Microfibre T-shirt bra with underwired, r
Microfibre T-shirt bra with underwired, r
Semi shiny nylon stockings with a wide,
Semi shiny nylon stockings with a wide,
Tights with built-in support to lift the bo
Semi shiny tights that shape the tummy,
Opaque matt tights. 200 denier.
Sweatshirt in soft organic cotton with a
Sweatshirt in soft organic cotton with a



Jersey
Jersey
Jersey
moulded
moulded
moulded
Semi
Semi
Tights
Semi
denier
press-stud
press-stud

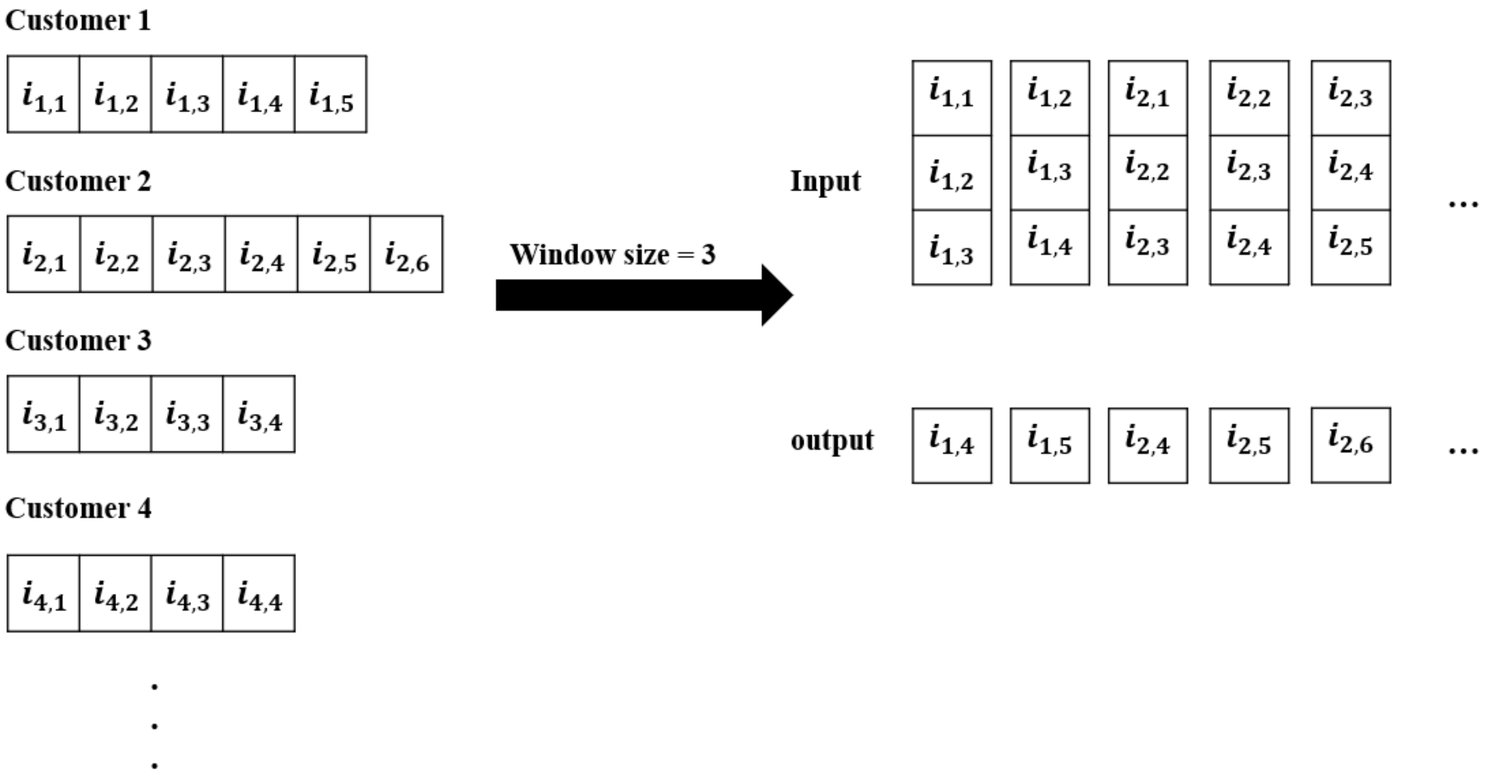
2. Model Design and Architecture

2.2 Sequence mini-batches



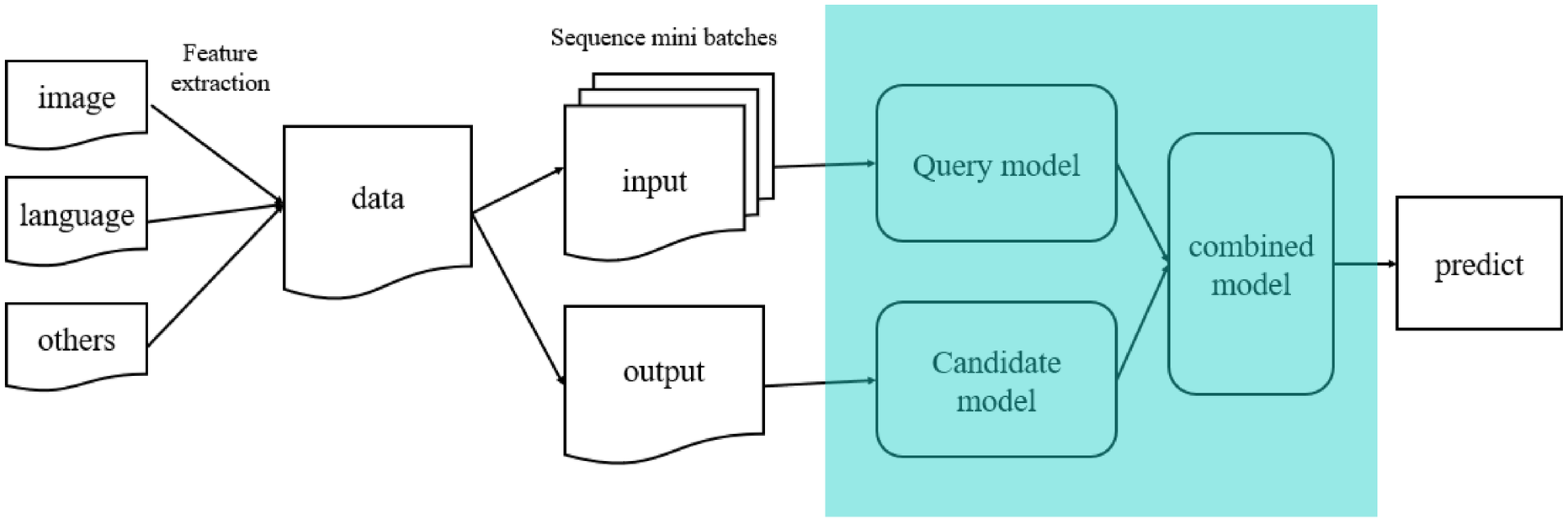
2. Model Design and Architecture

2.2 Sequence mini-batches



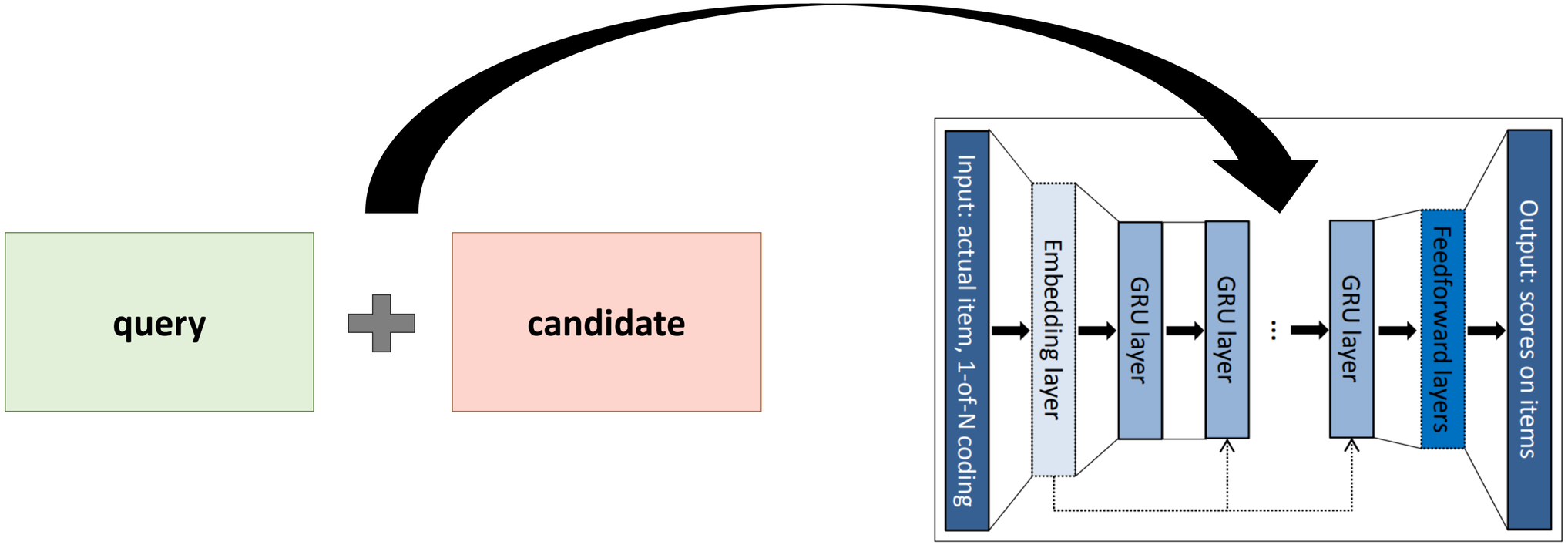
2. Model Design and Architecture

2.3 Recommendation system with deep learning



2. Model Design and Architecture

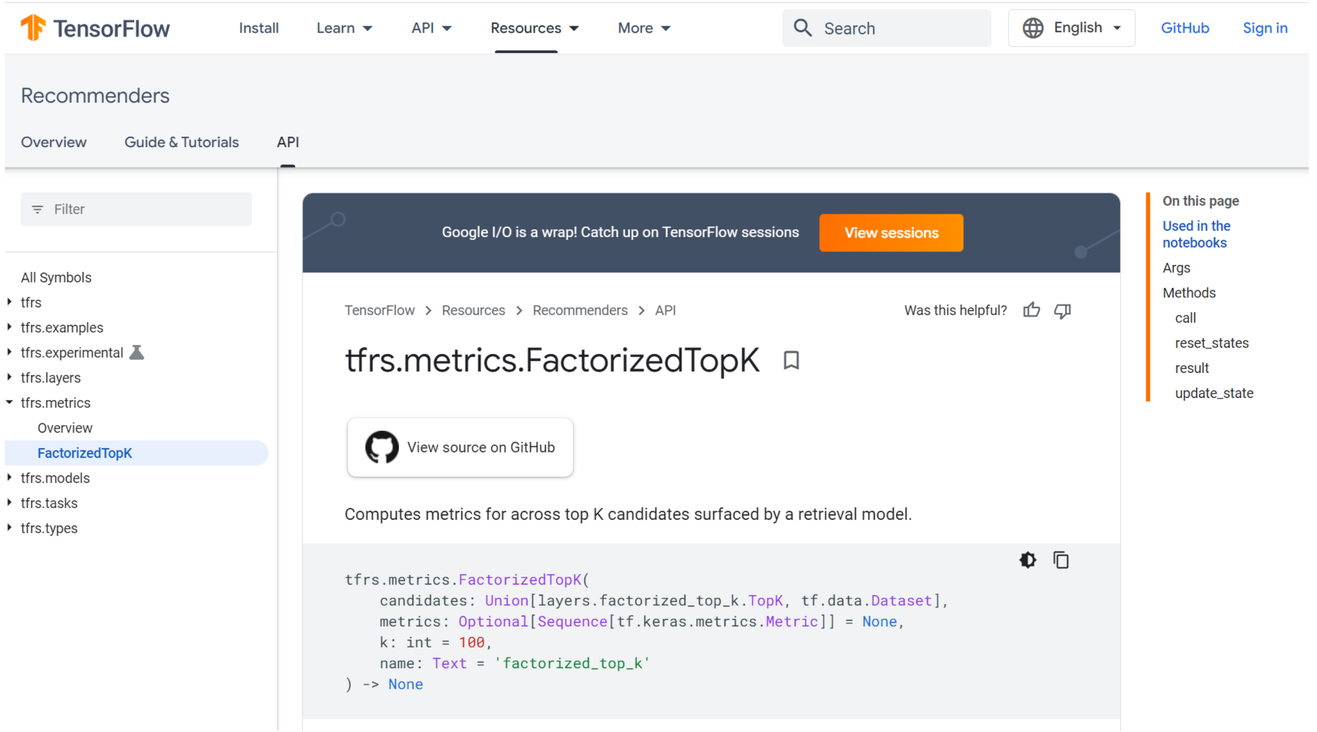
2.3 Recommendation system with deep learning



2. Model Design and Architecture

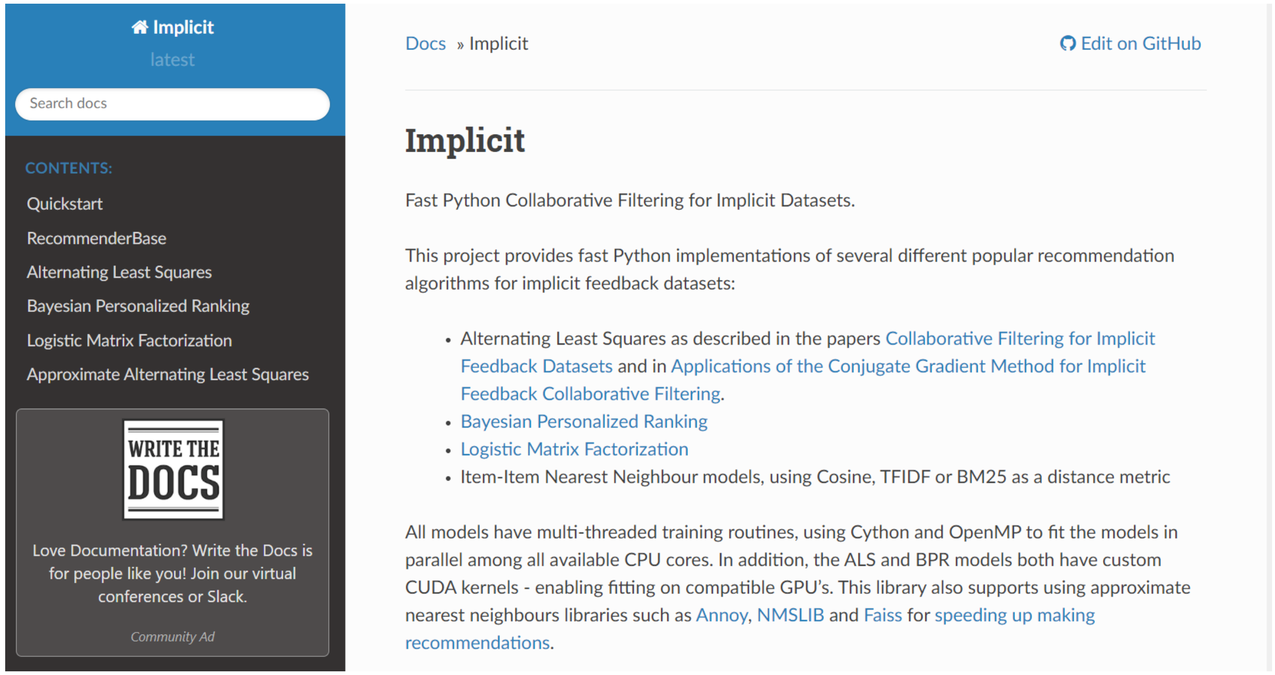
2.4 Evaluation criteria

top-k categorical accuracy evaluation



2. Model Design and Architecture

2.5 Comparison with prior models

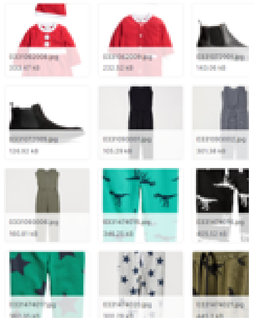


- Alternating Least Squares
- Bayesian Personalized Ranking
- Logistic Matrix Factorization

3. Data

Dataset “ H&M Data set ”

Meta data for each clothes



```
RangeIndex: 105542 entries, 0 to 105541
Data columns (total 26 columns):
 #   Column                        Non-Null Count   Dtype
---  ------                        --------------   -----
 0   Unnamed: 0                    105542 non-null  int64
 1   article_id                    105542 non-null  int64
 2   product_code                  105542 non-null  int64
 3   prod_name                     105542 non-null  object
 4   product_type_no               105542 non-null  int64
 5   product_type_name             105542 non-null  object
 6   product_group_name            105542 non-null  object
 7   graphical_appearance_no       105542 non-null  int64
 8   graphical_appearance_name     105542 non-null  object
 9   colour_group_code             105542 non-null  int64
 10  colour_group_name             105542 non-null  object
 11  perceived_colour_value_id     105542 non-null  int64
 12  perceived_colour_value_name   105542 non-null  object
 13  perceived_colour_master_id    105542 non-null  int64
 14  perceived_colour_master_name  105542 non-null  object
 15  department_no                 105542 non-null  int64
 16  department_name               105542 non-null  object
 17  index_code                    105542 non-null  object
 18  index_name                    105542 non-null  object
 19  index_group_no                105542 non-null  int64
 20  index_group_name              105542 non-null  object
 21  section_no                    105542 non-null  int64
 22  section_name                  105542 non-null  object
 23  garment_group_no              105542 non-null  int64
 24  garment_group_name            105542 non-null  object
 25  detail_desc                   105126 non-null  object
```

Meta data for each customer

```
RangeIndex: 1371980 entries, 0 to 1371979
Data columns (total 8 columns):
 #   Column                  Non-Null Count    Dtype
---  ------                  --------------    -----
 0   Unnamed: 0              1371980 non-null  int64
 1   customer_id             1371980 non-null  object
 2   FN                      476930 non-null   float64
 3   Active                  464404 non-null   float64
 4   club_member_status      1365918 non-null  object
 5   fashion_news_frequency  1355971 non-null  object
 6   age                     1356119 non-null  float64
 7   postal_code             1371980 non-null  object
```

Purchase history of each customer

```
RangeIndex: 31788324 entries, 0 to 31788323
Data columns (total 6 columns):
 #   Column          Dtype
---  ------          -----
 0   Unnamed: 0      int64
 1   t_dat           object
 2   customer_id     object
 3   article_id      int64
 4   price           float64
 5   sales_channel_id  int64
```

4. Experiments

	Top 1	Top 5	Top 10	Top 50	Top 100
Alternating Least Squares	0.0005232	0.0009522	0.001152	0.002362	0.005122
Bayesian Personalized Ranking	0.0004253	0.0008637	0.0009621	0.002682	0.004687
Logistic Matrix Factorization	0.0007104	0.001256	0.0009735	0.003632	0.006132
FOR-system + Simple RNN	0.001276	0.003533	0.004364	0.009085	0.01389
FOR-system + LSTM	0.0009501	0.001692	0.002078	0.004245	0.006383
FOR-system + GRU	0.0009204	0.001811	0.002197	0.004453	0.006502
FOR-system + Simple RNN + leveraging features	0.0006235	0.002464	0.003325	0.008016	0.01196
FOR-system + LSTM +leveraging features	**0.001633**	**0.003652**	**0.004750**	**0.009501**	**0.01437**
FOR-system + GRU+ leveraging features	0.0008907	0.002256	0.003147	0.007690	0.01143

<information of experiment>

- Tensorflow, keras, YAKE implicit
- Google Colab

<parameter of experiment>

- Embedding dimension : 128
- Epochs : 10
- Window size : 10
- Lag size :1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2007

THANK YOU