**PAPER 1 :**

**A Hybrid Recommender System for Patient-Doctor Matchmaking in Primary Care**

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**Summary** :

They model patient trust of family doctors using a large-scale dataset of consultation histories, while accounting for the temporal dynamics of their relationships. Our proposed approach shows higher predictive accuracy than both a heuristic baseline and a collaborative filtering approach, and the proposed trust measure further improves model performance.Helps in matching users to family doctors thus they’ll have more trust.Based on Homophily – patients choose doctors with similar characteristics as theirs.

**Factors while choosing the ideal doctor :**

1)     Patient doctor relationship – trust , repeated interactions.

2)     Recommender healthcare systems – for personalized recommendations , health guidance , recommendation based on the based consultation.

a.      Three Models in Recommender System :

                                               i.     Collaborative filtering – interaction b/w patient and doctor

                                              ii.     Content based – past preference.

                                             iii.     Matrix Factorization – [ extended CF ]

**Proposed Model** :

Combination of CF and CB – explicit feedback [ extra info from users ]+ implicit feedback [ behavioural observations ] + trust factor between patient and doctor.

**Data** :

42 million interactions between around 1.3 million patients and 3,500 doctors . For each patient, we also obtain basic demographic characteristics such as gender, age, municipality of residence, etc.

Diagram

Description automatically generated

ICD – International Classification of Diseases. [ ie patients with chronic diseases ].

Use Case 1 (UC1): New patient For new patients that have recently joined the network, we have only basic demographic characteristic – CB Recommender

UC2 , UC3 : patients who have no interaction with primary care doctors – ie family doctors , here they have tracked their previous visits to hospitals and the frequency and recommend doctors them there.

UC4, UC5 : patients who do visit family doctors : Use CB to recommend other doctors that have been visited by users who visit the family doctor.

**Accuracy :**

Chart, bar chart

Description automatically generated

HR – Hit rate

Baseline : Non personalized , based on popularity the doctors are recommended.

CF : Collaborative filtering  based on patient – doctor relationship

CF with Trust : also includes trust factor between the patient and doctor.

Hybrid : CF and CB : ie along with patient-doctor relationship + metadata of patient and doctor.

Hybrid with trust