

4SDrug Reproducibility

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Problem Introduction

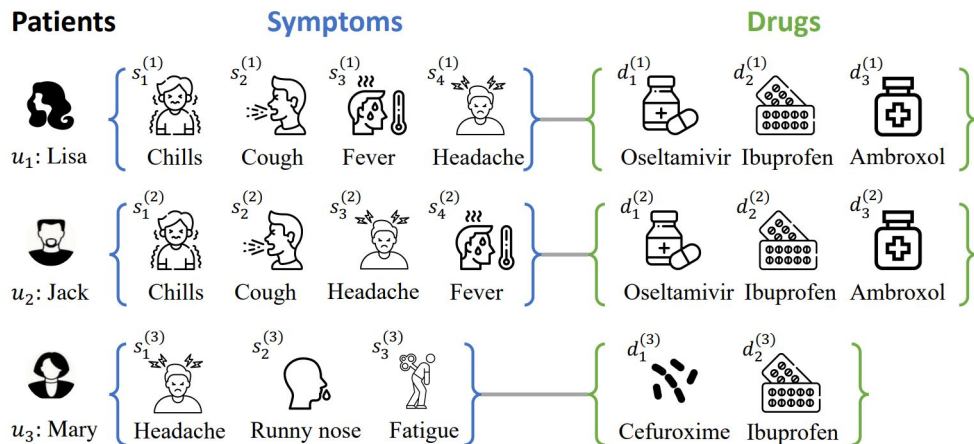


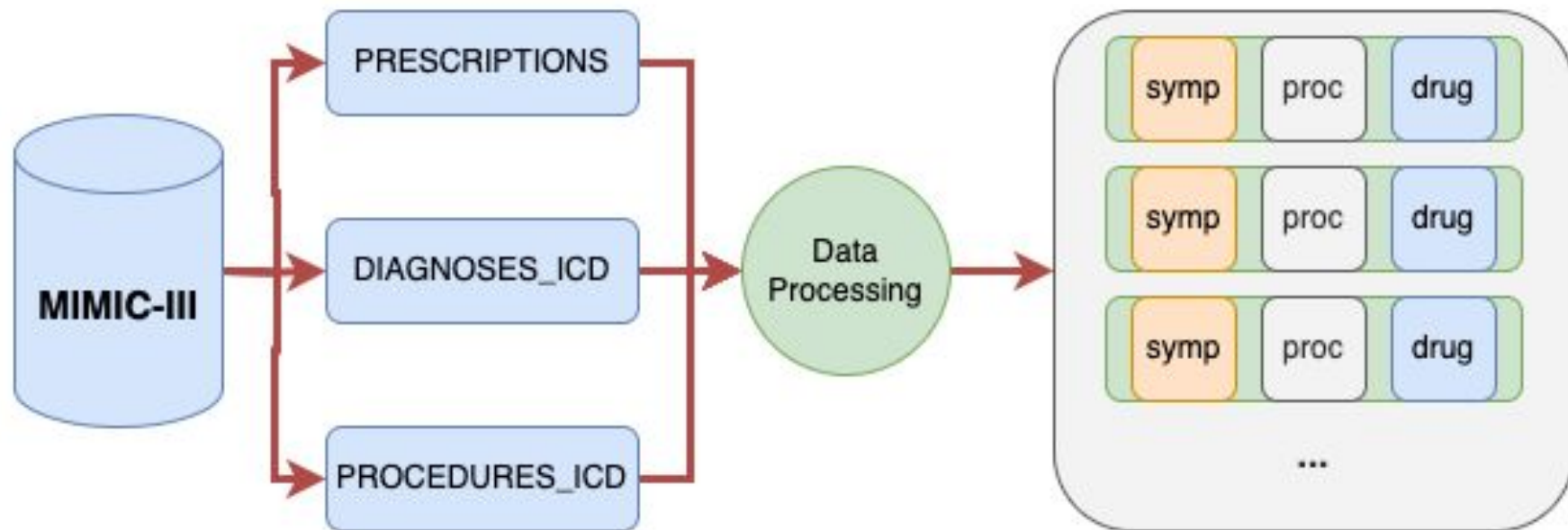
Figure 1 - 4SDrug

Drug Recommendation

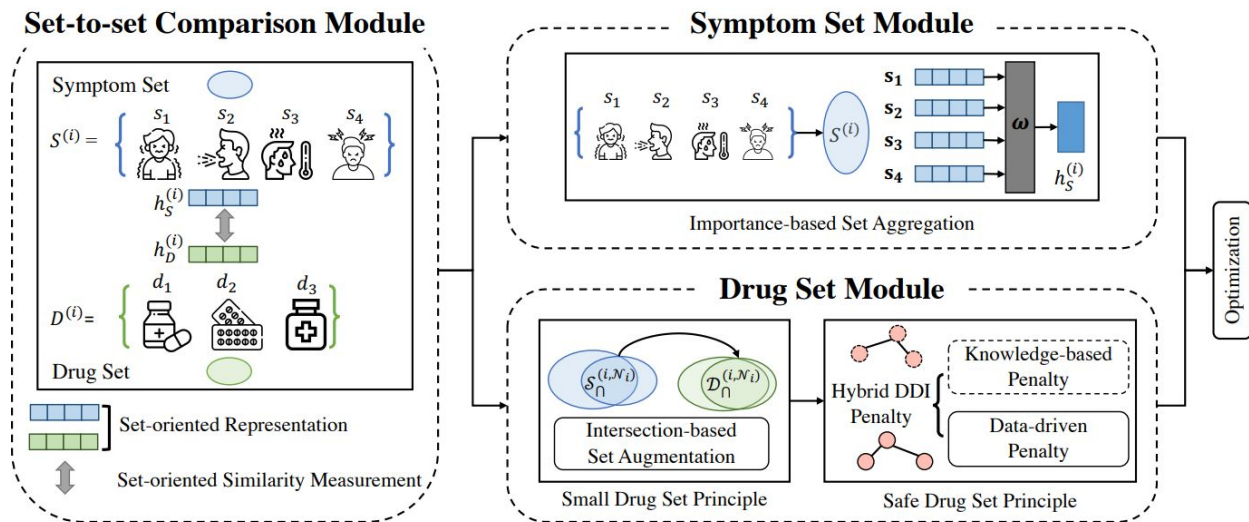
Criteria to consider:

1. Symptom to Drug Accuracy
2. Number of Drugs Prescribed
3. Drug to Drug Interactions

Data



Model



$$\mathcal{L} = \mathcal{L}_{rec} + \alpha \mathcal{L}_{inter} + \beta (\mathcal{L}_{K-DDI} + \mathcal{L}_{D-DDI})$$

Figure 2 - 4SDrug

Project Reproducibility

Data

Items	4SDrug	Reproduce
# of visits	27,869	15,032
# of symptoms	1,113	1,958
# of drugs	131	112
avg # of symptoms per symptom set	31.81	13.63
avg # of drugs per drug set	14.36	19.57
total # of DDI pairs	448	674

Table 1: Data Statistics - Recreating 4SDrug Table 2

Model

Method	Jaccard	F1	Avg # of Drug	DDI Rate	$ \Delta $ Avg # Drug	$\Delta\%$ DDI Rate
4SDrug (paper)	0.5041	0.6581	17.5040	0.0600	3.1440	-26.83%
4SDrug (reproduce)	0.4396	0.6024	13.2414	0.0525	0.856	-38.24%

Table 2: Experimental Results - Recreating 4SDrug Table 3

Our Results

α	β	best_ja	avg_med	DDI_rate
0.1	1.5	0.4595	14.9808	0.0477
0.1	1.0	0.4636	15.2901	0.0548
0.1	0.5	0.4705	15.8228	0.0641
0.5	1.5	0.4537	14.3707	0.0479
0.5	1.0	0.4601	15.1269	0.0555
0.5	0.5	0.4646	15.3081	0.0632
1.0	1.5	0.4514	14.2442	0.0497
1.0	1.0	0.4556	14.9358	0.0561
1.0	0.5	0.4592	15.3057	0.0631

Conclusion

References

- (4SDrug) Tan, Y.; Kong, C.; Yu, L.; Li, P.; Chen, C.; Zheng, X.; Hertzberg, V. S.; and Yang, C. 2022. 4SDrug: Symptom-based Set-to-set Small and Safe Drug Recommendation. In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, KDD '22, 3970–3980. New York, NY, USA: Association for Computing Machinery. ISBN 9781450393850.