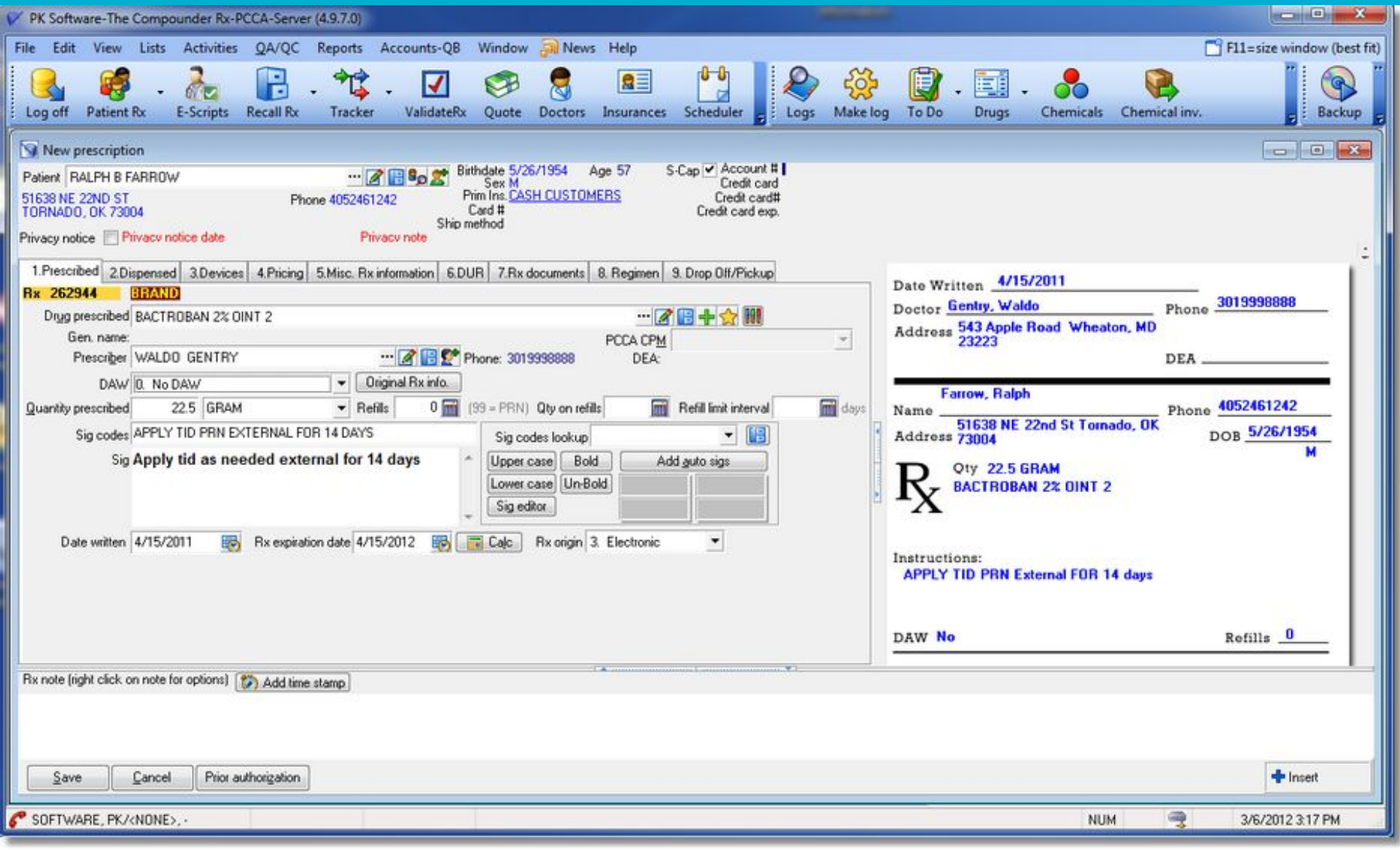
SenseRx

Anthony, Basma, Bill, Durugshan, Max, & Rober


PK Software-The Compounder Rx-PCCA-Server (4.9.7.0)
File Edit View Lists Activities QA/QC Reports Accounts-QB Window News Help
F11=size window (best fit)
Log off Patient Rx E-Scripts Recall Rx Tracker ValidateRx Quote Doctors Insurances Scheduler
Logs Make log To Do Drugs Chemicals Chemical inv. Backup
New prescription
Patient RALPH B FARROW
51638 NE 22ND ST
TORNADO, OK 73004
Phone 4052461242
Birthdate 5/26/1954 Age 57
Sex M
Prim Ins. CASH CUSTOMERS
Card #
Ship method
S-Cap Account #
Credit card
Credit card#
Credit card exp.
Privacy notice Privacy notice date Privacy note
1.Prescribed 2.Dispensed 3.Devices 4.Pricing 5.Misc. Rx information 6.DUR 7.Rx documents 8. Regimen 9. Drop Off/Pickup
Rx 262944 BRAND
Drug prescribed BACTROBAN 2% OINT 2
Gen. name:
PCCA CPM
Prescriber WALDO GENTRY Phone: 3019998888 DEA:
DAW 0. No DAW Original Rx info.
Quantity prescribed 22.5 GRAM Refills 0 (99 = PRN) Qty on refills Refill limit interval days
Sig codes APPLY TID PRN EXTERNAL FOR 14 DAYS
Sig Apply tid as needed external for 14 days
Sig codes lookup
Upper case Bold Add auto sigs
Lower case Un-Bold
Sig editor
Date written 4/15/2011 Rx expiration date 4/15/2012 Calc Rx origin 3. Electronic
Date Written 4/15/2011
Doctor Gentry, Waldo Phone 3019998888
Address 543 Apple Road Wheaton, MD 23223
DEA
Farrow, Ralph
Name Phone 4052461242
Address 51638 NE 22nd St Tornado, OK 73004 DOB 5/26/1954
M
Rx
Qty 22.5 GRAM
BACTROBAN 2% OINT 2
Instructions:
APPLY TID PRN External FOR 14 days
DAW No Refills 0
Rx note (right click on note for options) Add time stamp
Save Cancel Prior authorization Insert
SOFTWARE, PK/<NONE>, -
NUM
3/6/2012 3:17 PM

Can we make a smart search tool using machine learning to pick contextually appropriate medications?

SenseRx

Agenda

Data

Methodology

Demo

Results

Conclusion

SenseRx

Data

Tables

Admissions: ADMISSION_TYPE, ADMISSION_LOCATION, ICUSTAY_ID
Patient: GENDER, ICUSTAY_ID
Prescriptions: STARTDATE, ENDDATE, DRUG
labsfirstday: Everything!
Services: TRANSFERTIME, CURR_SERVICE, ICUSTAY_ID

SenseRx

Johnson, Alistair EW, et al. "MIMIC-III, a freely accessible critical care database." Scientific data 3 (2016): 160035.

Methodology

1. **Gathering & preparing the data**
   a. Identified and wrangled pertinent data tables
      i. Primary key: ICUSTAY_ID
      ii. Time points: First time/date observation in ICU
2. **Building a machine learning pipeline**
   a. Pre-processing (scaling, standardization, etc.) with scikit-learn and train/test + deployment with keras/TF
3. **Constructing a UI for patient query and interfacing with the model**
   a. Practitioner inputs `ICUSTAY_ID` and creates a prescription list

SenseRx

SenseRx

Demo

Model Metrics

Microaverage	
Precision	0.149
Recall	0.665
F1	0.243

SenseRx

Conclusions & Future Work

What are the limitations?

- Data is subsetted to first day
- Every patient on day 1 in the ICU is a “new patient”
- Our wrangled data does not include age

If you had more time, what would you do?

- Make it more personalized to include individual patient history such as recent prescriptions, microbiology
- Rank the probability of drugs
- Increase the recall of the model
- Customize the UI more using JavaScript

SenseRx

Reproducibility

Notebook files, this presentation and more at:

github.com/AnthonyMella66/**SenseRx**/

SenseRx