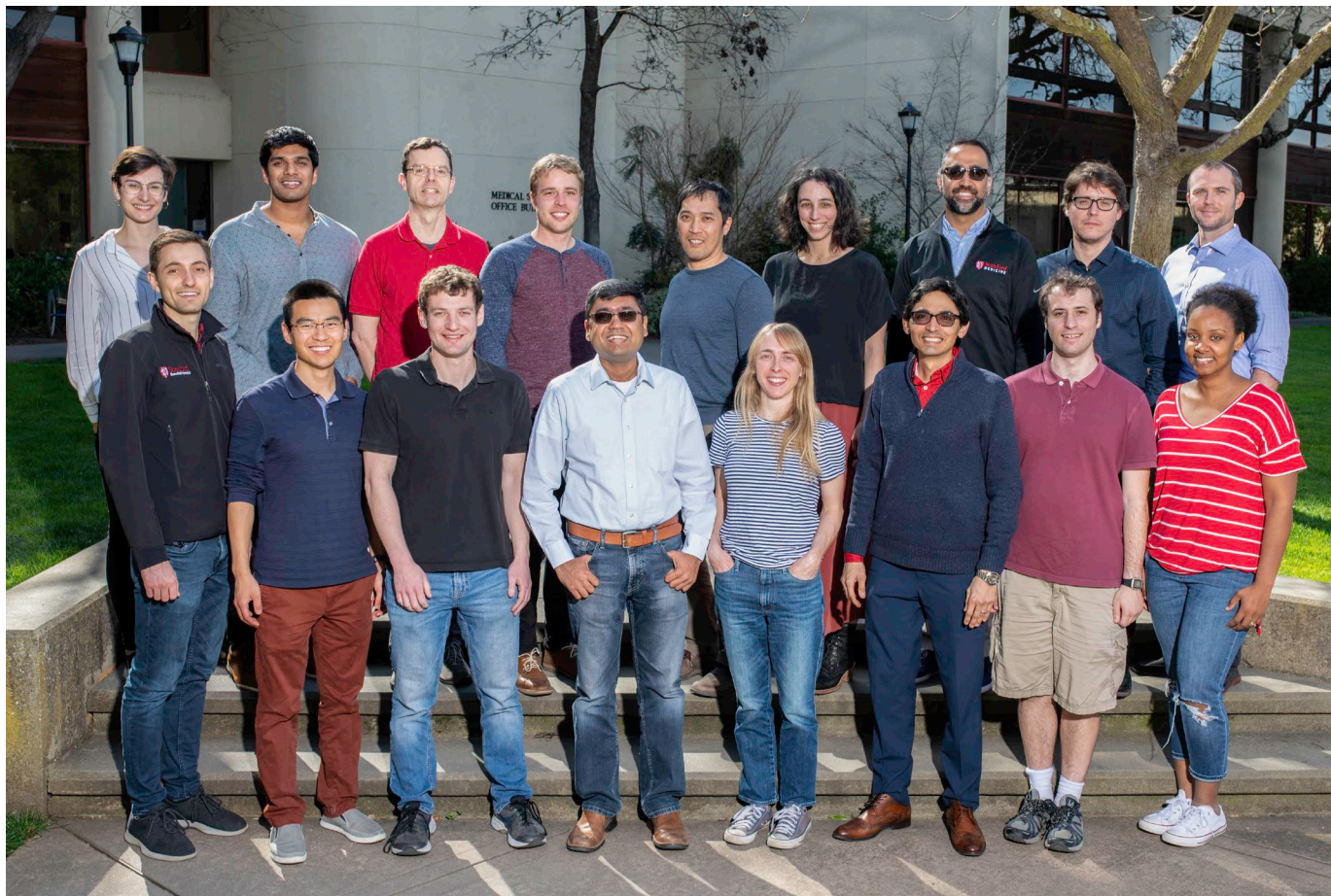


Building Data Capacity for Patient Centered Outcomes Research

Nigam Shah

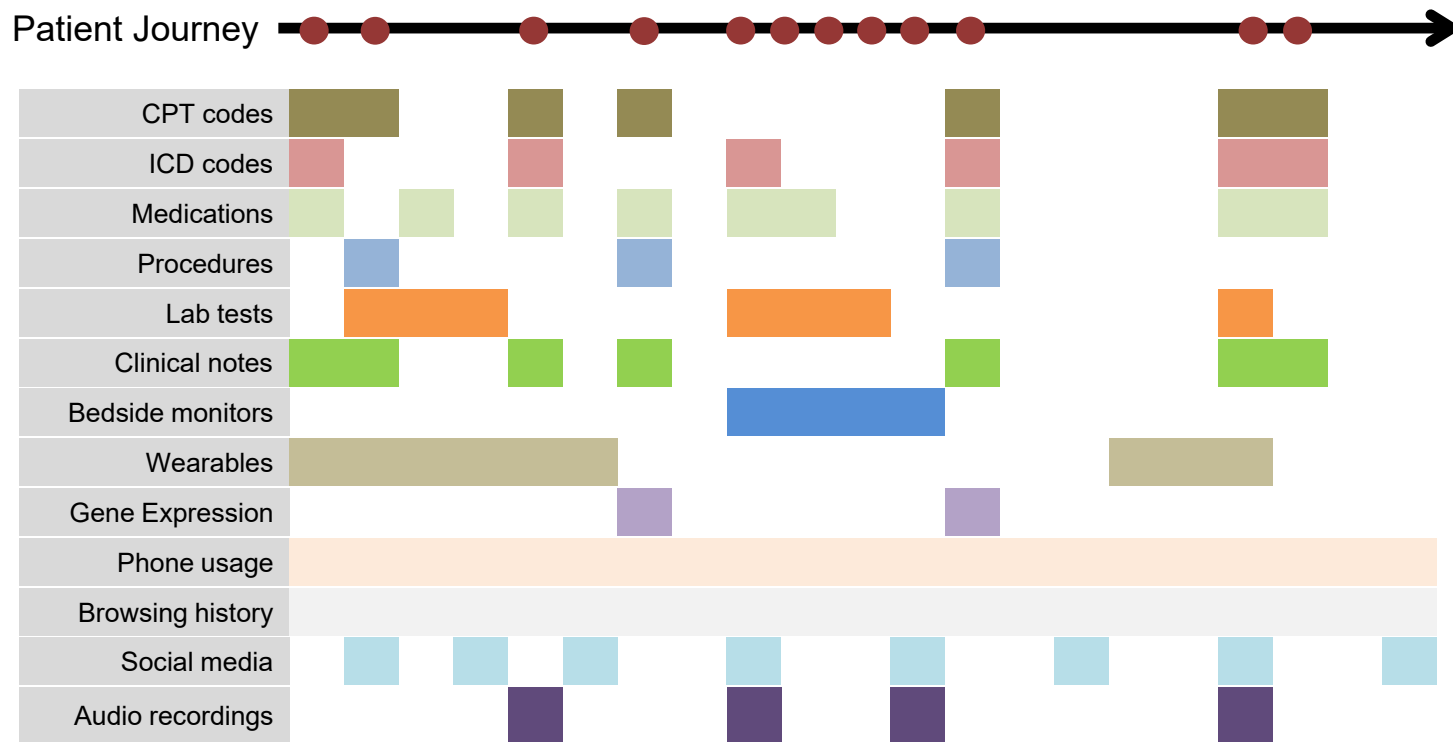
Acknowledgements



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- Industry – Healogenics, Janssen R&D, Oracle, Baidu USA, Amgen, Google, Apixio, CollabRx, Curai
- Philanthropic Gifts

A patient timeline view of data


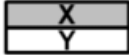

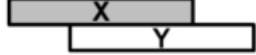
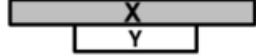
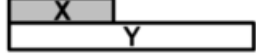
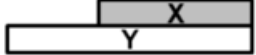


:

Perform interval algebra

Patients with a history of myocardial infarction who have pneumonia.

Patient with T2DM who are uncontrolled with metformin.

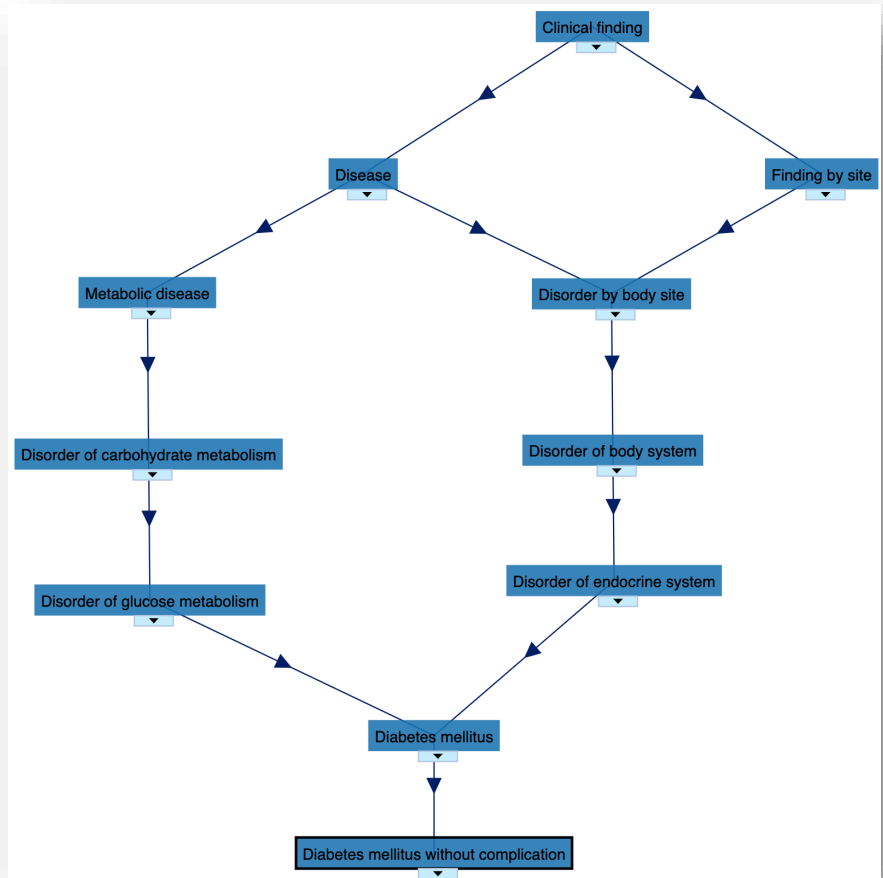
Allen Statements		Pictoral Example
Relations	Inverse Relations	
<i>X before Y</i>	<i>Y after X</i>	
<i>X equals Y</i>	<i>Y equals X</i>	
<i>X meets Y</i>	<i>Y met by X</i>	
<i>X overlaps Y</i>	<i>Y overlapped by X</i>	
<i>X contains Y</i>	<i>Y during X</i>	
<i>X starts Y</i>	<i>Y started by X</i>	
<i>X finishes Y</i>	<i>Y finished by X</i>	

Mate et al, A Method for the Graphical Modeling of Relative Temporal Constraints (Preprint)

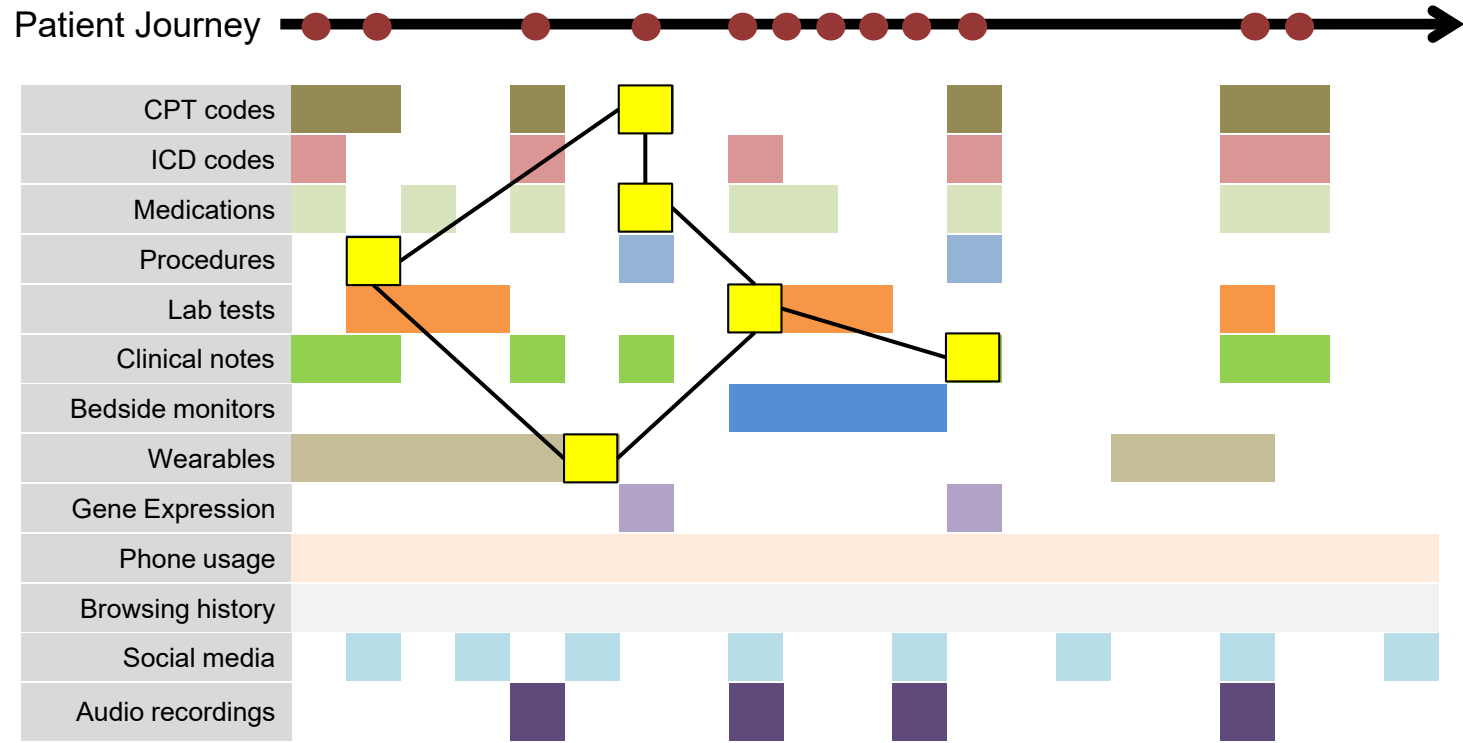
Navigate knowledge graphs

Patients with disorders
of glucose metabolism.

Patient with treated with
“beta blockers”.

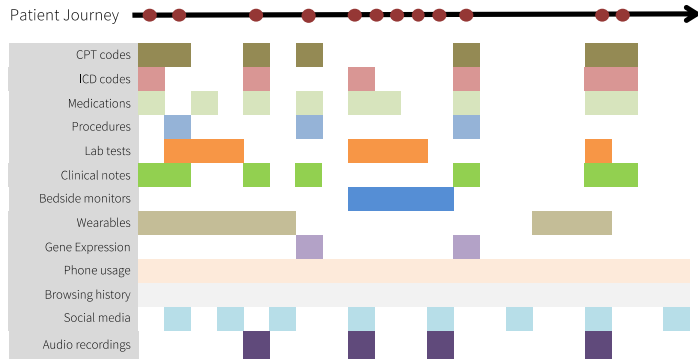


State phenotype definitions

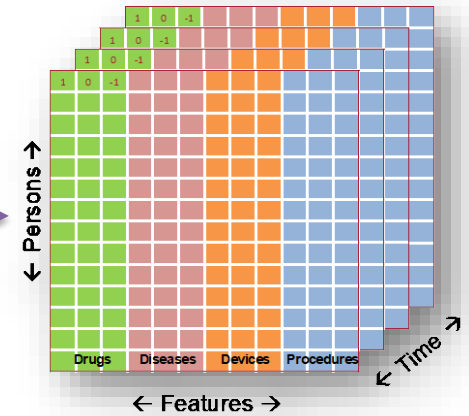


:

Generate a data frame

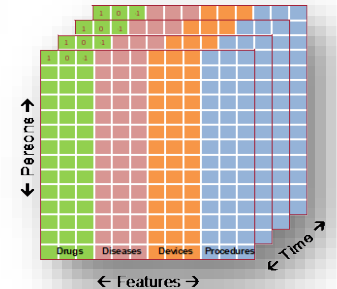
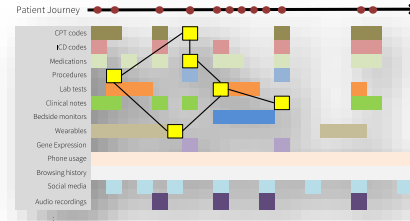
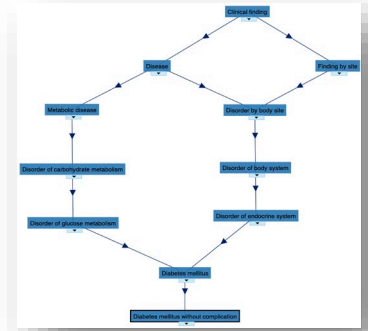
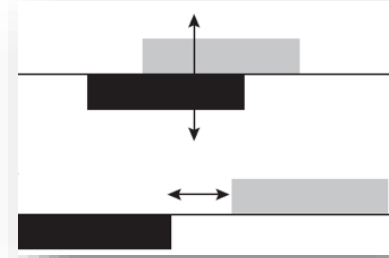


Interval algebra
Knowledge graph
Phenotype criteria



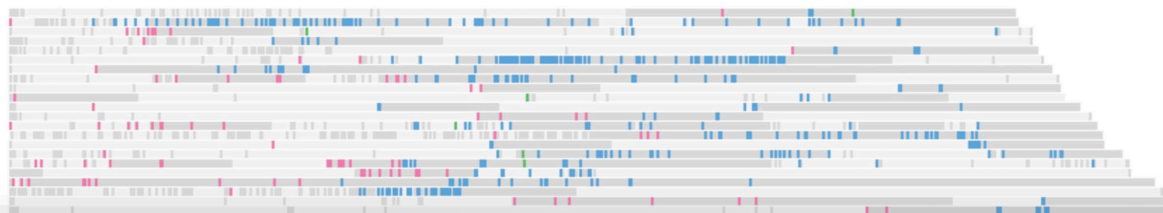
Summary of (real-time) technology requirements

1. Interval algebra
2. Knowledge graphs
3. Phenotype definitions
4. Data frame





265 patients showing 50 - 100 range




ACE: the Advanced Cohort Engine for searching longitudinal patient records

Alison Callahan , Vladimir Polony, José D Posada, Juan M Banda, Saurabh Gombar, Nigam H Shah  Author Notes

Journal of the American Medical Informatics Association, ocab027,
<https://doi.org/10.1093/jamia/ocab027>

Published: 13 March 2021 **Article history** ▼

 QUERY

 CLEAR

 EVENTS

 PATIENTS

```
1 //patients with cryptogenic stroke, where we don't have an
   obvious reason for the stroke
2 var stroke = INTERSECT(OR(ICD9=434, ICD9=436), NOT(OR(ICD9=393,
   ICD9=394, ICD9=397.1, ICD9=398, ICD9=246, ICD9=424.9, ICD9
   =V43, ICD9=433.1, ICD9=431, ICD9=434.11, ICD9=434.01)), AGE
   (40 YEARS, 90 YEARS), VISIT TYPE="inpatient visit", NOT(TEXT
   ="heart valve prosthesis"), NOT(TEXT="disease of mitral
   valve"), NOT(TEXT="rheumatic heart disease"))
```

HIGHLIGHTS

► \$AFIB
► \$STROKE
► SEQUENCE(\$STROKE*, \$AFIB) + (-5 ...