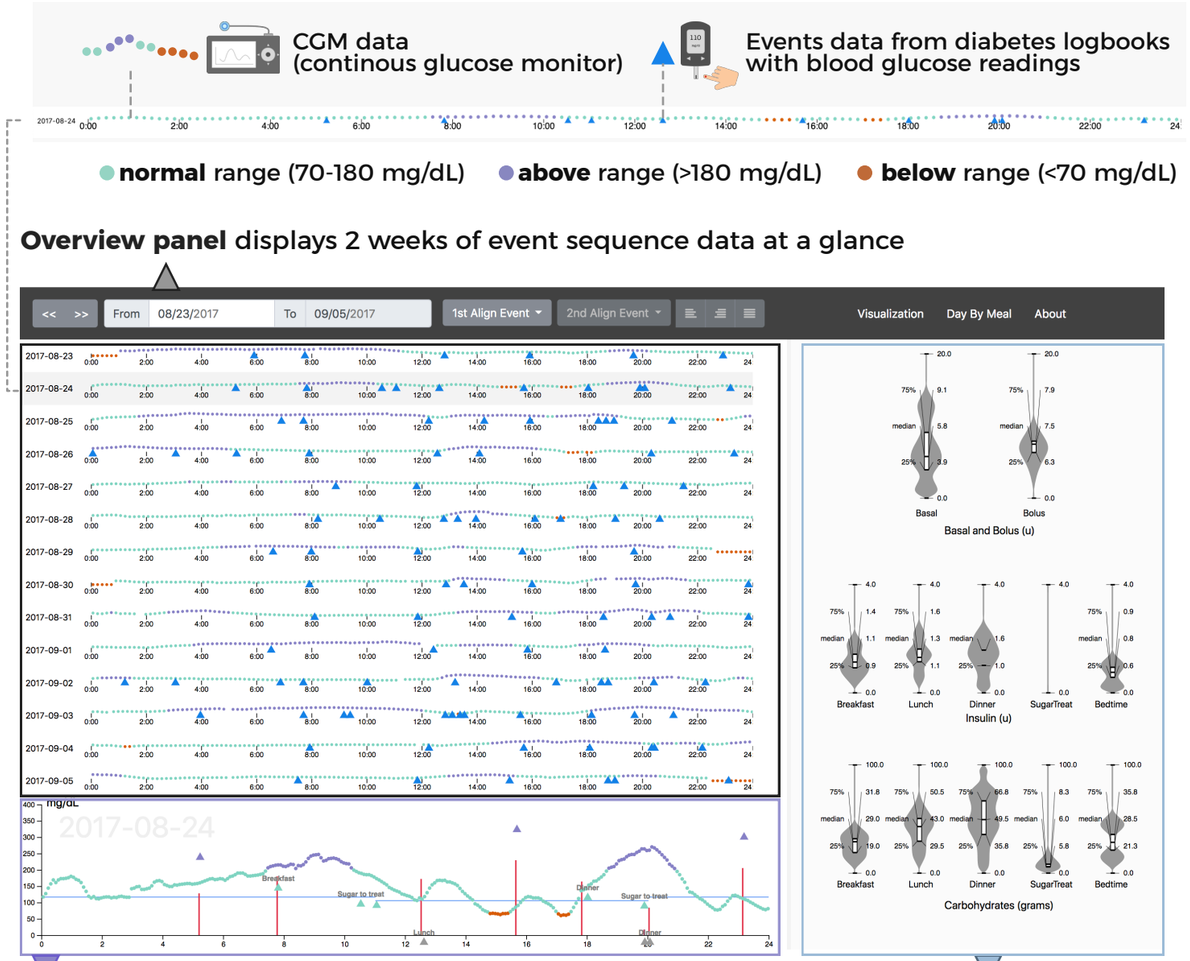
Visualization for Type 1 Diabetes Treatment Decision Support

Data Visualization Lab
Wellness Technology Lab
Northeastern University

Yixuan Zhang,[1, 2] Kartik Chanana,[1] Cody Dunne[1]

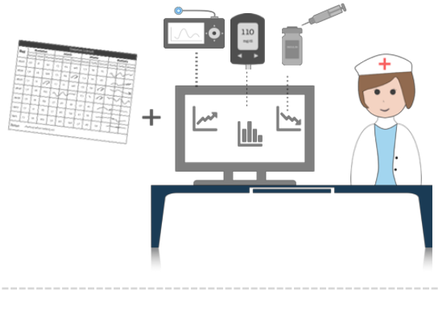
[1] Khoury College of Computer Sciences
[2] Bouvé College of Health Sciences

IDMVis is an interactive visualization tool for showing type 1 diabetes patient data. It is designed to help clinicians perform temporal inference tasks (e.g., recommending adjustments to patient insulin protocol, diet, and behavior).



Background & Research Gap

Type 1 diabetes is a chronic disease affecting millions of Americans. The goal of intensive diabetes management is to lower average blood glucose. Manual logs and medical device data are collected.



But these multiple sources are presented in **disparate visualization** designs — **making temporal inference difficult**.

Our Approach

Proposing **Hierarchical Task Abstraction** = Hierarchical task analysis + Task abstraction

to categorize the decision process and guide design decisions

Design and Development of **IDMVis**

Evaluation & Results

Qualitative Evaluation:
- 6 clinicians with an average of 17 years of experience

Results highlights:
- IDMVis reflects the workflow of clinicians
- Clinicians are able to identify issues of data quality such as missing or conflicting data, reconstruct patient records when data is missing, differentiate between days with different patterns, and promote educational interventions after identifying discrepancies

For more information, please visit **bit.ly/IDMVis**

This material is based upon work supported by the National Science Foundation under Grant number 1755901. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.