Using DeepNASH to Predict NASH patient trajectories on the Liver Transplant Waitlist
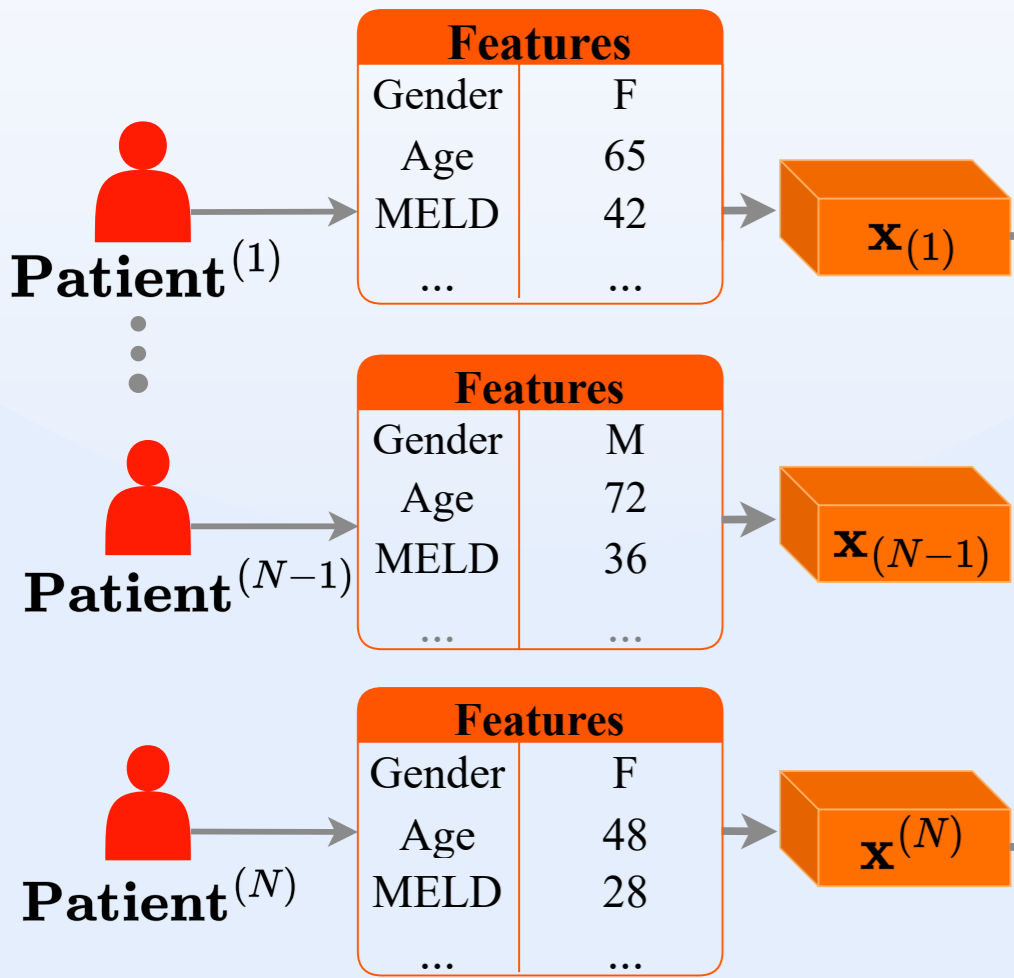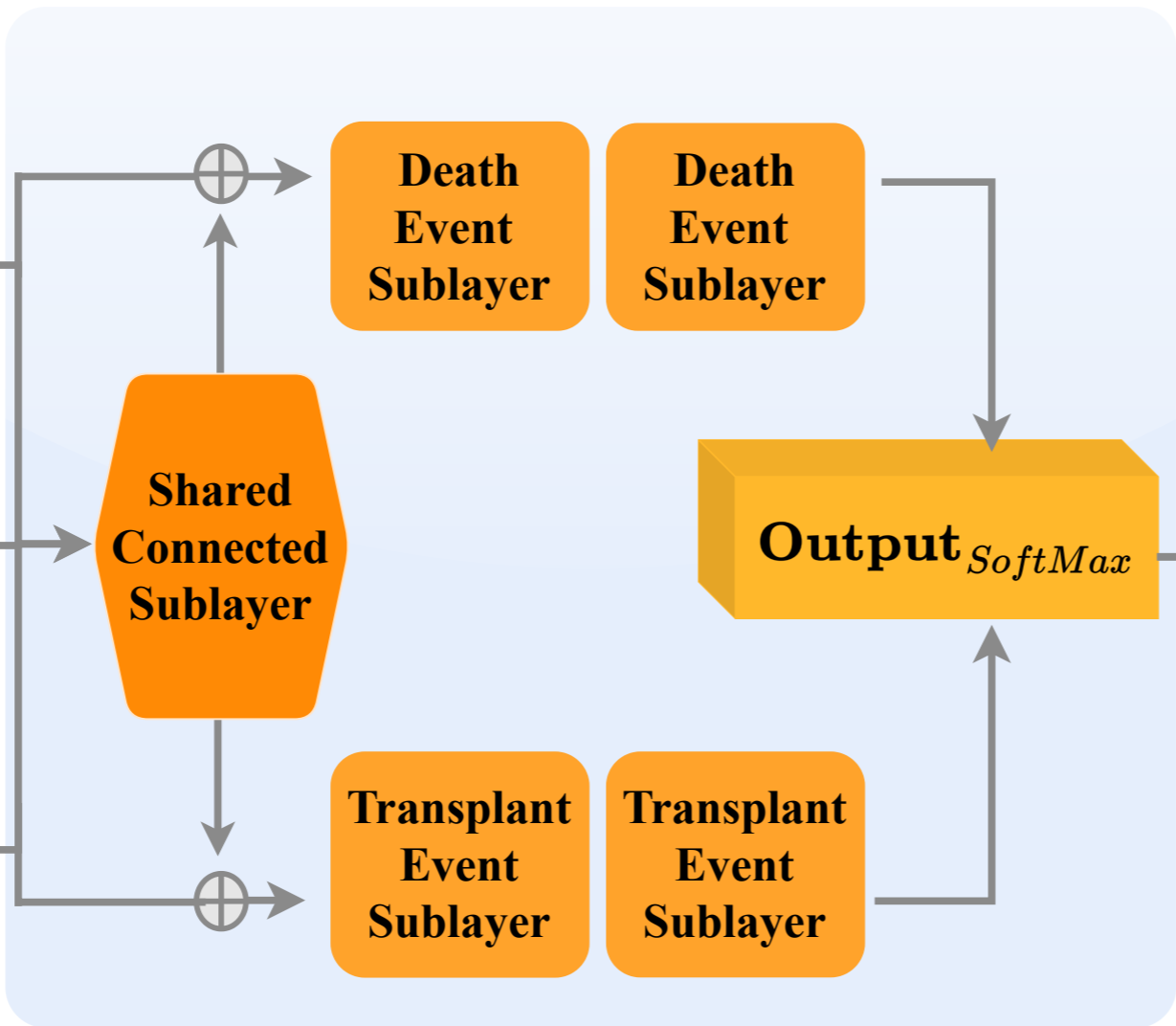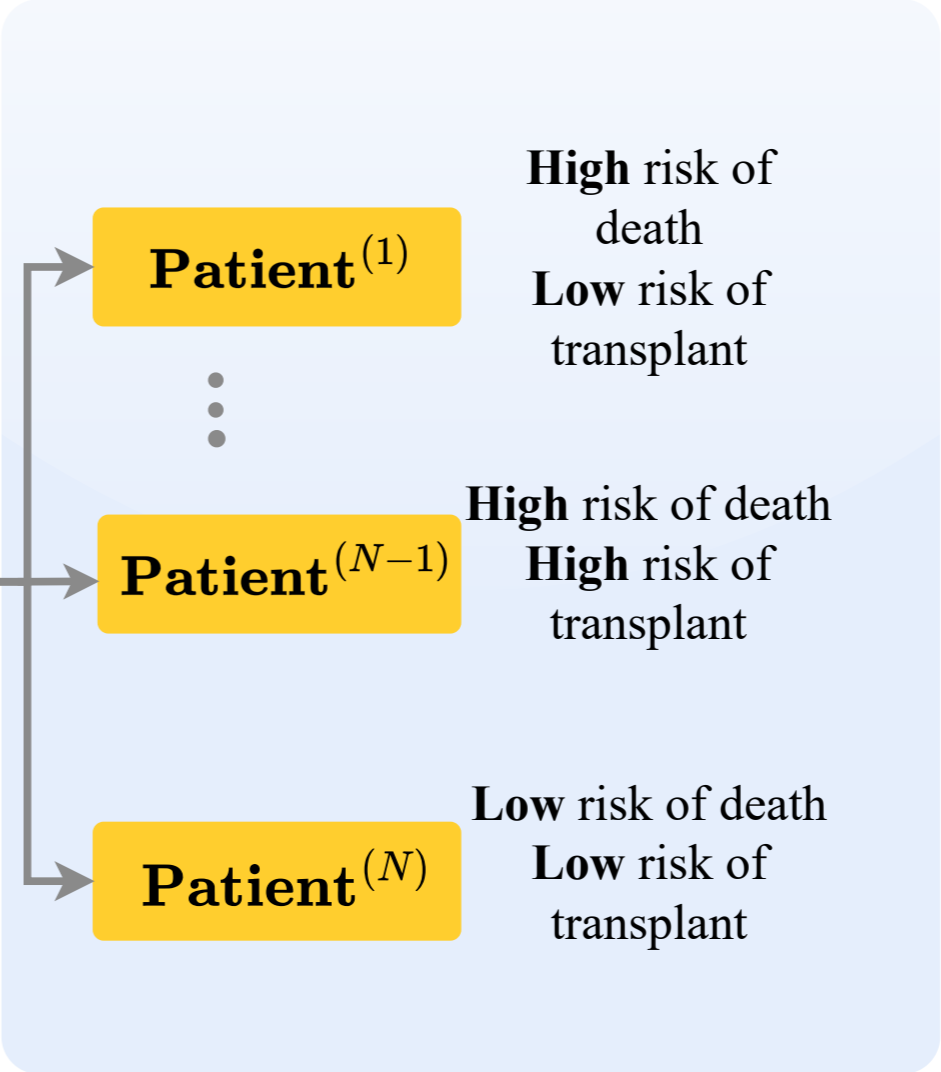
1. NASH Patient Variable Extraction

Patient$^{(1)}$

Features	
Gender	F
Age	65
MELD	42
...	...

$\mathbf{x}_{(1)}$

Patient$^{(N-1)}$

Features	
Gender	M
Age	72
MELD	36
...	...

$\mathbf{x}_{(N-1)}$

Patient$^{(N)}$

Features	
Gender	F
Age	48
MELD	28
...	...

$\mathbf{x}^{(N)}$

2. DeepNASH Neural Network

Shared Connected Sublayer

Death Event Sublayer **Death Event Sublayer**

Transplant Event Sublayer **Transplant Event Sublayer**

Output$_{SoftMax}$

3. Prediction

Patient$^{(1)}$ — **High** risk of death, **Low** risk of transplant

Patient$^{(N-1)}$ — **High** risk of death, **High** risk of transplant

Patient$^{(N)}$ — **Low** risk of death, **Low** risk of transplant

4. Clinician Insights

Clinical interpretation

Unlikely to attract an organ offer soon, measures must be taken to reduce mortality, can seek living donor options

Likely to undergo transplant soon, measures must be taken to reduce mortality

Likely stable condition, may advise patient to seek living donor options

5. Retrospective Model Performance: Competing Event Coherence Score

$$\mu - score = \frac{1}{M} \sum_{m=1}^{M} \mu_m$$

M is the number of patient who have had the event by time t

At actual event time $t*$, predicted risk of actual event is higher than the competing event

Coherence $\mu_m = 1$

Incoherence $\mu_m = 0$

DeepNASH Dashboard

Upload .csv file with patient data to DeepNASH Dashboard

Step 1: Upload Data

You need to upload a csv file.

Download input template

Choose a file containing patient logs:

Drag and drop file here
Limit 200MB per file

Browse files

DeepNASH forecasts the trajectory of the NASH patient after waitlisting by predicting monthly risks of death and transplant

DeepNASH