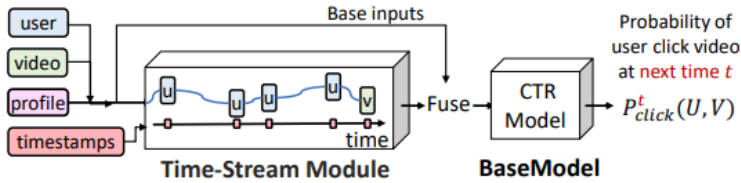
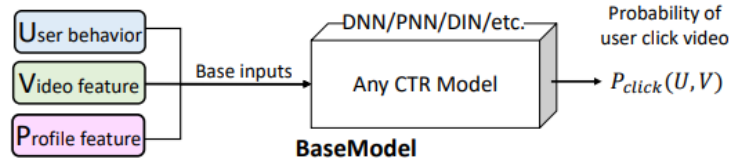


2016  
PNN

2016  
GRU4Rec

2020  
DTS

RNN  $\rightarrow$  ODE Solver



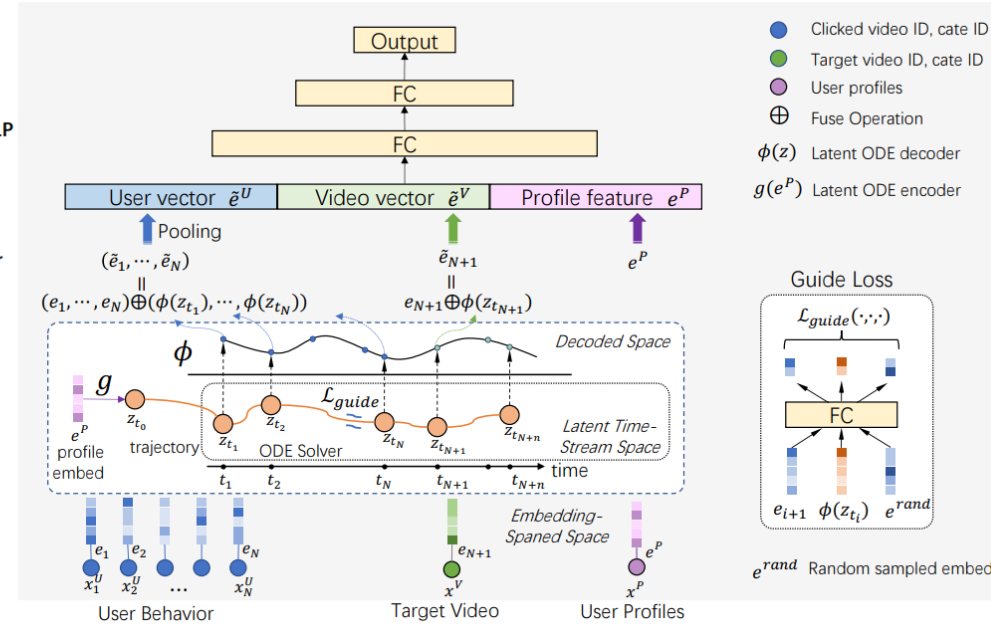
Output Units

BaseModel MLP

BaseModel  
Pooling Layer

Time-Stream  
Module

Embedding  
Layer



$$z_{t_1}, \dots, z_{t_N}, z_{t_{N+1}} = ODEsolve(z_{t_0}, f, \theta_f, t_1, \dots, t_N, t_{N+1}).$$

Deep Time-Stream framework (DTS)