Proposed Method

Prototype Learning

- First define two prototypes in the representation space: $\mathsf{C}, \mathsf{S} \in \mathbb{R}^K$
  - C is a prototype for optimizing the consumption objective L_C
  - S is a prototype for optimizing the interest sustainability objective L_S
- Then project a user-item pair into a single point such that: $\mathsf{T}_{u,i} = \mathbf{u} + \mathbf{i}$
  - T is a transformation function and use sum operation.

Proposed Method

Prototype Learning

- Given two prototypes, reformulate the objectives of CRIS^{reg} as follows:
  - $L_C^P(u, i^+, i^-) = [m + d(\mathsf{C}, \mathsf{T}_{u,i^+}) - d(\mathsf{C}, \mathsf{T}_{u,i^-})]_+$
  - $L_S^P(u, i^+, i^-) = \{(d(\mathsf{S}, \mathsf{T}_{u,i^+}) - d(\mathsf{S}, \mathsf{T}_{u,i^-})) - (p_{i^-} - p_{i^+})\}^2$
- Based on the prototypes, the consumption loss L_C^P makes the pair of a user and T_{u,i^+} closer to prototype C than the pair of the user and T_{u,i^-}.
- Similarly, L_S^P make the pair of a user and an item with higher ISS closers to prototype S than user and an item with lower ISS.