



Figure 2. The framework of DTGH. The red squares, blue squares and green squares represent the embeddings of patients, sub-forums and topics respectively. There are two encoders designed for updating embeddings. The Local Encoder includes the Health stage corresponding to the Eq. 2 and LSTM Aggregator corresponding to the Eq.3. The Global Encoder mainly encodes the global similarity between patients across time using Multi-head global collaborative attention, which corresponds to the Eq. 7-9. The predicted embeddings of sub-forums (predicted by Eq. 13) and topics (predicted by Eq. 13) are predicted based on patients' current states (modeled by Eq. 11) and historical interactions (modeled by Eq. 12). The logical constraints are designed to guarantee the logic between the predicted sub-forums and topics, which corresponds to the Eq. (15-16). The Loss calculates the distance between updated embeddings and predicted embeddings.