

Statistic Consulting - Final Project Proposal: Social Media Popularity Prediction

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Social Media Prediction Dataset (SMPD): a massive-scale, multimodal, and temporal dataset with over **486K social multimedia posts from 70K users** and various social media information including anonymized photo-sharing records, user profiles, images, texts, times, or other metadata. SMPD is collected from Flickr's online streams. For keeping temporal properties, we conducted a chronological split for training and testing data (commonly, by date and time). There are 305613 and 185612 posts for training and testing, respectively. The details can be found in [CHALLENGE MAINPAGE](#) and [TECH-REPORT](#).



Dataset Description: Different with single-task datasets, SMPD is a multi-faced data collection, which contains rich contextual information and annotations for multiple-tasks (such as user profile, post category, customize tag, geography information, photo image, and photo metadata). The overview statistics of the dataset are shown in Figure. Each of social media post has corresponding visual content and textual content information (e.g. posted photos, photo categories, custom tags, temporal and geography information). There are total 30+ features with different modalities.

Proposed Methods:

- (1) **CLIP-adapter:** CLIP-adapter is a model extension technique that enhances performance on specific tasks by adding small, adaptable modules to the CLIP model without retraining the entire model.
- (2) **Temporal Fusion Transformer:** Temporal Fusion Transformer is a deep learning model for time-series forecasting that integrates convolutional layers, attention mechanisms, and gated recurrent units to effectively handle temporal dependencies and multivariate inputs.
- (3) **Hierarchical Category Embedding:** Hierarchical Category Embedding is a technique for handling categorical data, especially when categories have a clear hierarchical structure, by learning embeddings that capture relationships and hierarchies among categories.
- (4) **LSTM (Long Short-Term Memory):** LSTM is a type of recurrent neural network (RNN) designed to process and predict long-term dependencies in sequence data, using gated mechanisms to control the flow of information.