

Spatio-Temporal Stamp Processing

Significant nonverbal behaviors in communication can be categorized into five dimensions: body movements, paralinguage, spatial effects, environmental factors, and time. People have emotional responses to their surroundings, thus an individual’s perception of the environment also constitutes another important part of nonverbal behavior. The environment can influence individuals seeking help, eliciting reactions such as alertness, annoyance, comfort, or stress, and these reactions depend on the degree to which the individual selects or filters relevant aspects of the environment.

As the first exploratory work on the impact of such nonverbal behaviors on online psychological counseling dialogue systems, this paper primarily investigates how the time of day, the surrounding environment, and the weather affect a person’s psychological state and the psychological counseling dialogue. Below is the workflow of how we process spatiotemporal status information:

For time of day and weather, we mainly used information extraction through HanLP. In addition, given that these information is often less obvious, we extract it through the way of regular expression to better the effect of the model. For example, “getting up” means morning, but for students, the location can be “home” or “dormitory”, so we have to analyze the proper location. Therefore, the annotation of the dataset costs a considerable amount of manpower and time.

Furthermore, to enable the model to more intuitively learn the impact of spatiotemporal information on psychological counseling and generate appropriate responses, we have invited professional psychological counselors to summarize the potential effects of this information on emotional states and integrate these insights into the prompts. This allows for the creation of spatiotemporal stamps \widetilde{ST}_i in conjunction with the spatiotemporal state ST_i . Specially, for location, we would recommend that the client choose a response to the scenario that is moderately pleasurable, thus allowing him to feel comfortable and relaxed, to further explore the internal issues, and to reveal himself.

Location	Impact on Psychological Counseling
Home	Provides a strong sense of security, making it suitable for discussing private and sensitive topics.
School	May involve academic pressure and social issues, making it suitable for discussing adolescent-related topics.
Company	In a professional environment, suitable for discussing work stress, career planning, and life balance.
Outdoors	Natural environments may help with stress relief and relaxation, making it suitable for casual conversations and emotional release.

Table 8: Location Influencing Psychological Counseling

Time of Day	Impact on Psychological Counseling
Morning	Clients will be more awake and energetic, making it a good time to recommend counseling methods that require focus.
Afternoon	Clients’ emotional state may be influenced by their activities throughout the day, such as work or school. They may need to cope with stress, so providing emotional support and relaxation techniques is beneficial.
Evening	Emotions are more open, and conducive to deep exploration of inner issues. However, evening clients may be more tired, affecting their ability to process counseling content.
Late Night	Late night clients tend to be more emotional, with fragile and sensitive emotions, requiring greater empathy and a sense of security.

Table 9: Time of day Influencing Psychological Counseling

Weather	Impact on Psychological Counseling
Rainy Day	May trigger melancholy or reflective moods, making it suitable for exploring inner distress.
Heatwaves	High temperatures may cause irritability, affecting concentration, making it suitable for discussing emotion management.
Sunny Day	Brings positive emotions, suitable for positive thinking and future planning.

Table 10: Weather Influencing Psychological Counseling

Season	Impact on Psychological Counseling
Spring	The season of renewal brings a sense of hope, ideal for discussing new beginnings and growth.
Summer	Energetic but may also bring anxiety and stress, making it suitable for discussing stress management.
Autumn	Pleasant weather, suitable for reflection and adjustment, and discussing personal development and life balance.
Winter	The cold season may trigger loneliness and depressive moods, making it suitable for deep exploration of emotional issues.

Table 11: Season Influencing Psychological Counseling