The linear projection layer can be connected to the attention computing module to establish a holistic flow of information from feature transformations to attention-based aggregations. Connections can orchestrate the transition of queries, keys, and value representations from the projection operation to the attention computation process that generates the final enhancement node embedding. In some embodiments, the connection ensures that the transformation features from the linear projection layer are properly integrated within the attention computing framework implemented by the attention computing module.

The multi-head attention architecture can achieve the capture of diverse relationship patterns through the parallel operation of four attention heads in the attention head array, combined with the system feature transformation and aggregation operations implemented through the linear projection layer and the attention computing module. The architecture can provide comprehensive cross-modal relationship modeling capabilities that enhance the representation quality of node embeddings within the six-node graph structure while maintaining computational efficiency suitable for real-time deployment scenarios on mobile devices, AR/VR platforms, and desktop platforms.

It is understandable that the multimodal gaze estimation system based on the lightweight graph neural network provided by the embodiment of the present application corresponds to the above-mentioned multimodal gaze estimation method based on the lightweight graph neural network, and the explanation, examples, beneficial effects and other parts of the relevant content can refer to the corresponding content in the multimodal gaze estimation method based on the lightweight graph neural network, which will not be repeated here.

Example 7:

In a third aspect, the present application further provides an electronic device, comprising a memory, a processor, and a computer program stored on the memory and executable on the processor, wherein the processor, when executing the program, implements steps of the multimodal gaze estimation method based on a lightweight graph neural network as described in any of the above embodiments and its preferred embodiment.

It is understandable that the multimodal gaze estimation electronic device based on the lightweight graph neural network provided by the embodiment of the present application corresponds to the above-mentioned multimodal gaze estimation method and system based on the lightweight graph neural network, and the explanation, examples, beneficial effects and other parts of the relevant content can refer to the multimodal gaze estimation method based on the lightweight graph neural network and the corresponding content in the system, which will not be repeated here.

Example 8:

In a fourth aspect, the present application further provides a non-transient computer-readable storage medium on which a computer program is stored, wherein the computer program, when executed by the processor, the steps for implementing a multimodal gaze estimation method based on a lightweight graph neural network described in any of the above embodiments and its preferred embodiments are implemented.

It is understandable that the multimodal gaze estimation storage medium based on the lightweight graph neural network provided by the embodiment of the present application corresponds to the above-mentioned multimodal gaze estimation method and system based on the lightweight graph neural network, and the explanation, examples, beneficial effects, and other parts of the relevant content can refer to the multimodal gaze estimation method based on the lightweight graph neural network and the corresponding content in the system, which will not be repeated here.

The above embodiments are only used to illustrate the technical solution of the present application, not to limit it. Although the present application is described in detail with reference to the aforementioned embodiments, ordinary technicians in this field should understand that it can still modify the technical solutions recorded in the aforementioned embodiments, or replace some of the technical features therein; These modifications or substitutions do not make the essence of the corresponding technical solution out of the spirit and scope of the technical solutions of each embodiment of the present application.