Hello everyone! I'm Tianxin Xu. Today, I'm honored to share with you the content related to AI emotion recognition technology.

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Let's start with the project background. Emotion recognition, simply put, is to identify and understand human emotional states by analyzing human facial expressions, voices, texts, or physiological signals, such as heart rate and brain waves. Common emotional categories include happiness, sadness, anger, surprise, fear, disgust, and so on. This technology has a wide range of application scenarios. In the field of human-computer interaction, it enables machines to better understand users' emotions and provide a more natural interaction experience. In mental health, by analyzing users' emotional states, mental health monitoring and intervention can be achieved. In marketing, it can analyze consumers' emotional reactions to advertisements or products, so as to optimize marketing strategies. In the education field, teachers can adjust teaching methods according to the identified emotional states of students to improve learning effects. In security monitoring, it can identify abnormal emotions in public places and prevent potential dangers.

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From a technical perspective, emotion recognition is an important research direction in the field of artificial intelligence. It helps to enhance machines' understanding of human emotions and promotes the progress of human-computer interaction technology. At the social level, it can improve the human-computer interaction experience, allowing machines to provide more intelligent and humanized services. It can also detect users' psychological problems in a timely manner and provide personalized mental health support. Deploying relevant systems in public places can improve social security. Economically, it can help enterprises analyze consumers' emotions, optimize product design and marketing strategies, enhance market competitiveness, and partially replace labor in fields such as customer service and education, reducing operating costs.

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Next, let's talk about the project objectives and challenges.

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 The main objectives of our project are as follows: First, to achieve real-time emotion analysis by developing a real-time emotion recognition system that can quickly respond to users' inputs and output analysis results. Second, based on deep learning technology, build an efficient emotion recognition model that can accurately identify a variety of emotional states. Third, support multimodal data input to extract emotional information from various data such as facial expressions. Fourth, provide visual analysis tools to display emotion recognition results in the form of charts or reports for users to understand and use.

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However, the project also faces many challenges. Data diversity is a major problem. People of different cultures, genders, and ages have different ways of expressing emotions, which requires the model to have strong generalization ability. In real-time application scenarios, the model not only needs to ensure accuracy but also meet the requirements of low latency. In addition, emotion recognition involves users' sensitive information, so how to ensure the security and privacy of data is crucial.

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Now, let me introduce the implementation of the project.

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This is the emotion recognition system we have built. Let me show you some practical application examples. For example, when you upload an image containing a human face (supporting JPG, PNG, GIF formats), the system will automatically detect the facial emotions and display the analysis results and confidence levels. If the analysis result shows that the user is in a neutral emotion with a confidence level of 90%, the system will also give some coping suggestions, such as that the user is in a good state and should maintain the current rhythm of life and mindset and do some relaxing activities appropriately.

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If the system detects that the user is in a state of surprise with a confidence level of 98.5%, it will prompt that the user has encountered a pleasant surprise and suggest enjoying this happiness and sharing it with others.

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And there are some other examples,such as happy,angry and fear.

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This system is based on a deep learning-based emotion recognition model, and the analysis results are for reference only. Here is the confusion matrix of our model. From the matrix, you can intuitively see the performance of the model in identifying different emotional states.

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Finally, let's look ahead to the project applications and future prospects.

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In mental health diagnosis, doctors can assist in assessing mental health by analyzing patients' facial expressions, voices, and texts. For example, they can identify the emotional characteristics of patients with depression, such as long-term sadness and depression, and timely remind for further diagnosis and intervention. In rehabilitation monitoring, real-time monitoring of the emotional changes of recovered patients helps therapists adjust rehabilitation plans. For example, when patients show anxiety and depression, therapists can provide timely guidance to improve the compliance and effectiveness of treatment. In the elderly care field, cameras and wearable devices are used to collect the emotional information of the elderly. Once negative emotions such as loneliness and anxiety are detected, caregivers can provide care in a timely manner.

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In the evaluation of classroom effectiveness in the education scenario, teachers can understand students' acceptance and interest in teaching content by analyzing students' classroom expressions and body languages, and then adjust teaching methods in a timely manner. When advertising, real-time monitoring of the audience's emotional feedback, analyzing expressions and physiological reactions to evaluate the attractiveness of advertisements. If the effect is not good, the advertisement content and form can be adjusted in a timely manner. In the process of film and television creation and production, we can grasp the emotional needs of the audience, adjust the editing and soundtrack according to the emotional reactions to different works, and enhance the appeal of the works.

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In conclusion, emotion recognition technology, as an important research direction in the field of artificial intelligence, has broad application prospects and social value. Through deep learning technology, we can build efficient and accurate emotion recognition models to provide strong support for multiple fields. Of course, there are still some challenges in the development process, but I believe that with the continuous progress and improvement of technology, these problems will be gradually solved.

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Thank you all for listening!