ریاضیات کاربردی:

Recently, a large number of biological features have been are applied to identity recognition, such as iris recognition, fingerprint recognition, gait recognition and face recognition. These biological features are easy to use, to distinguish and difficult to forge. Compared with other methods, non touching and aggression are the biggest advantages and features of face recognition. As a hot topic, more and more attention has been focused on the face recognition. Face recognition is considered to have broad application prospects in video surveillance, access control system, criminal investigation and other fields [1–7]. General face recognition methods can be broadly divided into two categories of local and global approaches [8]. The task of those local methods is to extract different local features. For another, global approaches process the entire image and make a general template for the face [8]. It should be noted that some deep learning methods such as Convolution Neural Network (CNN) and tensor face also achieve good results. Global approaches usually adopt a projection technique to manipulate the image as a whole and create a general tem- plate for each face pattern. The main work is to find the best template which can describe the test object. Eigenface and Fisherface are the most famous methods in this category. In the eigenface, Principle Component Analysis (PCA) is proposed and can reduce the dimension effectively. It projects images into a low-dimension space and seeks a linear transformation matrix that maximizes the data variance in the projection subspace [9]. Another linear projection is insensitive to variation in lighting direction and facial expression which is implemented by Fisher's Linear Discriminant Analysis (LDA). LDA is a supervised scheme that aims at minimizing the within-class variances as well as maximizing the between-class distances in the projection subspace [9]. However, we often meet the problems of small sample size or high dimensional data in faceclassification and recognition tasks. Therefore, the traditional LDA is not generally available for our direct use due to the fact that the within-class scatter matrix is always singular [6]. Local methods take another path. These approaches process different parts of the image to obtain salient features which are used to learn patterns of different people. Support Vector Machine (SVM) is proposed and used to classify the features extracted from a set of facial components in a component-based system. To extract local topographic representations for objects, Local Feature Analysis (LFA) was mentioned in [8]. For the deep learning methods, CNN is capable of learning local features from the input images and complete recogni- tion.

We must prove by experiment that forces are vector quantities. Actually, that has been done: forces are indeed vector quantities; they have magnitudes and directions, and they combine according to the vector rules of Chapter 3.

This means that when two or more forces act on a body, we can find their **net force,** or **resultant force,** by adding the individual forces vectorially. A single force that has the magnitude and direction of the net force has the same effect on the body as all the individual forces together. This fact is called the **principle of superposition for forces.** The world would be quite strange if, for example, you and a friend were to pull on the standard body in the same direction, each with a force of 1 N, and yet somehow the net pull was 14 N.

In this book, forces are most often represented with a vector symbol such as F, and a net force is represented with the vector symbol ^net* As with other vectors, a force or a net force can have components along coordinate axes. When forces act only along a single axis, they are single-component forces. Then we can drop the overhead arrows on the force symbols and just use signs to indicate the directions of the forces along that axis.

That assumption works well if, say, a puck is sent sliding along a *short* strip of frictionless ice—we would find that the puck's motion obeys Newton's laws. However, suppose the puck is sent sliding along a *long* ice strip extending from the North Pole (Fig. 5-2*a).* If we view the puck from a stationary frame in space, the puck moves south along a simple straight line because Earth's rotation around the North Pole merely slides the ice beneath the puck. However, if we view the puck from a point on the ground so that we rotate with Earth, the puck's path is not a simple straight line. Because the eastward speed of the ground beneath the puck is greater the farther south the puck slides, from our ground- based view the puck appears to be deflected westward (Fig. 5-2*b).* However, this apparent deflection is caused not by a force as required by Newton's laws but by the fact that we see the puck from a rotating frame. In this situation, the ground is a **noninertial frame.**