

### **1. Brief summary of the problem:**

For a message as a string of ASCII characters. Sender side use dices to encode this message. A webcam will record images which are created by dices packets. It will be transmitted to receiver. Receiver side decodes those images and makes original message.

### **2. Solution idea:**

We divide the problem into 3 parts: encode – decode, image processing and arrange dices into packets.

Encode – decode converts the message into chain of dices and vice versa.

Image processing converts images into chain of dices.

Arrange dices into packets is deployed manually.

Each part will consist of some algorithms.

### **3. Algorithm steps:**

We use a data compression algorithm to convert the message into a shorter amount of information. Then, by relying on the

properties of dice, we transfer the amount of information that a sequence of dice according to certain laws.

After receiving images from server, we use some image processing algorithms to extract the information contained in the image and then export the original message.

In addition, we use a number of tricks to speed up and correct errors during transmission.

### **4. Language programing**

We use Visual Studio 2012 (C#) and Java programming languages with some library to deploy project. Our program is written in .NET framework 4.0 and runs in Windows 7 OS.