Algorithm Applications

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September 29, 2015

TODO: brief introduction

1 Algorithm 1: AUDIO STREAMING PATCHING

Nowadays, much of the data transferred online is through audio and video streaming. This can take a toll on the reliability and speed of the user's network. This, therefore, causes much more data to be lost and the transfer of the stream to be interrupted. To overcome this issue, an algorithm has been developed to patch the streaming audio (particularly music) with stored recordings or expected repeat snippets from earlier in the track. This is for patching a loss that is unacceptable to the user(15-20 seconds). Basically, along with existing audio compression techniques, a method is used to monitor the syntax of the music when streaming over a low bandwidth network. Using a method called Song Form Intelligence(SoFI), the packet loss is determined and then a scan is performed through portions of the song already received in the buffer to see if a possible match exists. The song is first divided into chunks (i.e. Intro, Verse, Chorus) and then each chunk holds the corresponding packets received. If, for instance, a packet is lost on the second repeat of the chorus, the matching packet from the first chorus will replace it. The goal is to make the loss undetectable to the user and produce a smooth stream. Reference: ACM Transactions on Intelligent Systems and Technology, Vol. 6, No. 2, Article 25, Publication date: March 2015. Pattern Matching Techniques for Replacing Missing Sections of Audio Streamed across Wireless Networks JONATHAN DOHERTY, University of Ulster KEVIN CURRAN, University of Ulster PAUL McKEVITT, University of Ulster

2 Algorithm 2: RUBIK'S CUBE CIPHER

Data security is one of the bigger issues facing people today. With so much of society's interactions taking placing online, encryption algorithms are needed to make sure that only the people for which the message is intended can access it. The Rubik's Cube Image Encryption algorithm takes images sent by user one, changes it into something completely unrecognizable by shuffling the pixels' rows and columns and then doubly ciphering the image using two different ciphering matrices created from chaotic systems. Once the algorithm reaches the person it was intended for, that person decrypts the image using a related algorithm that transforms the image back into the original. This algorithm helps to ensure the only the users with the correct key can decrypt the image, ensuring privacy throughout the whole transaction. Reference: Mathematical Problems in Engineering, Vol. 2013, Article ID 848392, Publication date: February 2013. An Improved Secure Image Encryption Algorithm Based on Rubik's Cube Principle and Digital Chaotic Cipher ADRIAN-VIOREL DIACONU, University Politehnica of Bucharest KHALED LOUKHAOUKHA, Laval University

3 Algorithm 1: TODO:SHORTNAME

TODO: explain what problem Algorithm 1 solves

4 Discussion

This is an optional section, for this assignment.