Term Project Requirements

Overview

This document describes requirements for a video file query preprocessor as a front end to a multimedia database. This preprocessor will accept an Audio-Video Interleave (AVI) file with some control variables and output a series of still images and columns for two relational database tables: one containing metadata for the entire AVI file, another metadata for each still image.

Background

Statement of Need
News videographers deal with thousands of hours of unedited video that can be useful in future productions. For example an interview may have more importance in the future as a story progresses then it does now. It is, however, difficult for staff to be mindful of all appropriate video content in the electronic news gathering library.

A method for extracting metadata for logging and querying purposes is needed. This process should be automated, so that the same types of metadata is culled from all clips. The metadata should be useful either on disk as a series of flat files or stored in a database with some querying facility.

Hypothesis
Video is a time ordered medium composed of discrete images. Often there is an accompanying sound track which can contain music, speech, or both. The following metadata attributes can be extracted from video for storage in a relational database:

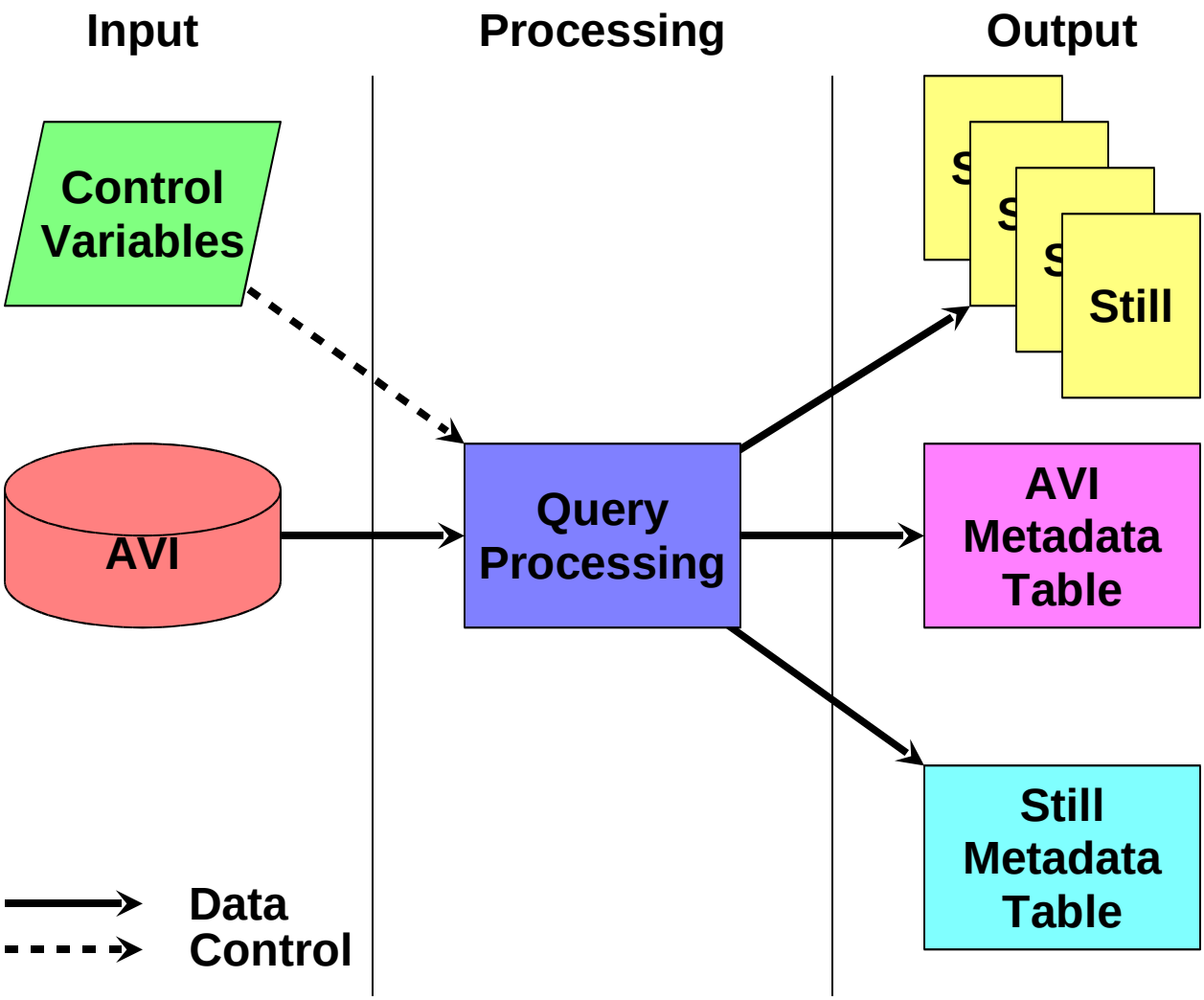
1. File system metadata: bytes, length, video encoder, and so on.
2. Discrete still images sampled at uniform intervals.
3. Short sound samples, perhaps five seconds, sampled uniformly.
4. Text transcripts of speech.

The above are listed in increasing extraction difficulty.

Limitations
We will focus on the first two attributes for expansion: file system and still image metadata. Our project, however, will allow for the inclusion of the other types at some future time.

Input-Processing-Output Model

The following diagram shows the IPO model for our project. Inputs are on the left, processing activities are in the center, and outputs are on the right:



Inputs
The following items need be present before processing can begin:

- Control variables supplied by the user, such as seconds between stills.
- An AVI source file.

Processing
A program or series of programs will convert the inputs into the desired output.

Note: since this is a requirements document, processing is described as a single node. This node will be decomposed during the design stage.

Outputs
We expect the following items to be present after query processing:

- A series of still images generated per the control variables.

- A row entry into a database table for file system metadata.
- A row entry for each still image extracted into another metadata table.

Note: there is a one to many relation between file system and still image metadata tables. For each row in the first table, there can be zero or more entries in the second.

Schedule

The following represent the major tasks and deadline dates needed to complete the project:

Task Name	***Description***	***Deadline***
Identify AVI Still Image Extraction Software	Find either open source or “freeware” software capable of extracting still images from an AVI file. Either a library or a program with command line operation will suffice.	October 7
Design Relational Data Model	Generate an Entity Relationship Diagram or other documentation to describe the schema for both metadata tables.	October 21
Write Control Variable GUI	Develop a graphic user interface for collecting variables to control query processing.	November 4
Write Integration Engine	Code software that can start the extraction software controlled by user variables and generate data or statements that can be used to populate the metadata tables.	November 18
Test Project	Write a test plan to verify the project meets the requirements of this document.	November 23

Unknowns

Because the amount of work necessary to perform still extraction is unknown, we will reserve any requirement to actually populate a relational database. However outputs that can be used to generate row insertions are required.