EE320 Term Project

Scope

Use the system-level tokens in SystemView to build your project. You can block out the beginning and some blocks, but you will have to build the project itself using the full version in the communications lab in E&A 603E.

You will build your project in SystemView according to the block diagram below and keep the file on your own media such as a floppy disk or USB memory stick. Back up the file; you are responsible for the integrity of your file.

Deliverables and Schedule

The term project is due on April 24, 2005 at the beginning of class.

You will deliver your SystemView file by one of three means:

- Email, with identification of the attachment as your term project final submission.

- Floppy disk, CD-ROM or other inexpensive media. This will not be returned.

- Copy from your computer or Zip disk to my memory stick on a Temple computer.

You will deliver a short report that contains these elements:

- Identification of yourself, the project, the course, date and semester, and that this is your term project report.

- A narrative of each token in the path from the signal input to the BER measurement. Describe the token and what it does, functionally, in your project. Describe all inputs and what they do.

- Supporting material printed from your project.

The supporting material will include, but is not necessarily limited to, the following:

- A SystemView block diagram of your project

- Plots from the analysis window as necessary to support your report.

The report will be delivered as a hard copy (printout) and as a file. The file may be delivered by any of the three methods above. Format must be readable by MS Word XP.

Block Diagram Requirements

This section describes the required blocks to design and implement your term project. If your design uses different blocks or a different order, please ask me to make sure that this is acceptable.

Input:

Frequency sweep, 1000 Hz to 3500 Hz, plus noise 20 dB down

Coding

Use convolutional coding on the bit stream. After coding, add noise to get an SNR according to the table below. Use the default SystemView convolutional encoding for code rate ½ (output length 2) and constraint length 3.

Decoding

Decode using the matching convolutional codes, and use hard decoding. You will compare this with soft decoding in the evaluation phase.

Output

The output is an analog signal. You may use the companion bit stream to analog metasystem in the file ADC_8B_2_Serial.svu to obtain an analog system if your concept requires this function. Filter with an analog filter to bound the spectrum and eliminate high-frequency images of the signal spectrum. During the development phase you can use analysis or graphic sinks. You can also listen to the audio output, and you can substitute your own WAV files for the frequency sweep.

Evaluation

Evaluation will be in two phases: BER and audio testing. We will evaluate the BER for hard and soft bit decision on the convolutional decoder, and we will pass an audio WAV file through your system and listen to it. For BER evaluation, use the SystemView BER testing.

Digitization

First, look at using the existing token libraries provided with SystemView. At your own discretion, you may use the digital-to-bit stream 8-bit metasystems on the web site:

http://astro.temple.edu/~jkbeard/

To obtain these files, click on Files on the navigation bar on the left and download ADC_8B_2_Serial.svu; this file has both metasystems in a simple test circuit.

SNR Settings

You will inject noise between the convolutional encode and the convolutional decode according to the table below. Record the BER for hard and soft decoding. Then, adjust

the SNR to obtain a BER of 10^{-6} or better for WAV file evaluation. Record this SNR and BER.

	Name	$\dfrac{E_b}{N_0}, dB$
DERICK	ABREFA-KODOM	8.0
PASMA	APEHAYA	8.1
NADIA	BARAKAT	8.2
AYOU S	BIRCH	8.3
ANNABELLE C.	BOADO	8.4
RYAN D	CARDONE	8.5
PHO M	DO	8.6
SEDOFIA N K	GEDZAH	8.7
MOR MORDECHAI	MADJAR	8.8
PHUOC H	NGUYEN	8.9
TIM THANH	NGUYEN	9.0
TUAN H.	NGUYEN	9.1
TONY J	PANG	9.2
BHAVESH V	PATEL	9.3
LENA S	ROIDAD	9.4
REBEKAH S	SCHOLL	9.5
DEREK R	STRAKER	9.6
ISAAC K	TANUI	9.7
BAO	TRAN	9.8
EDMAN G	ZAYZAY	9.9