2015 Fall - Information Theory

Homework 1

Part 1

Read the paper : "The mathematical theory of communication "(on the course website) , and answer the following questions:

1) What kind of problems are defined as communication problem?
2) What kind of engineering applications did Shannon have in mind?
3) What kind of mathematics did he developed to study the problem at hand?

Part 2

Develop a blink encoder

It is possible that one day you could wake up after a stroke having lost complete control over your body apart from your eyelids. This is called **locked-in syndrome** and it has occurred few times in the medical history.

In this rare eventuality, you would still want to communicate with the world and thus you should develop now a system for communicating with the world using only your eyelids. This will allow you to maintain contact with the world as this patient did https://en.wikipedia.org/wiki/The_Diving_Bell_and_the_Butterfly. In the accompanying compressed archive you will find a matlab template for your blinking encoder and decoder. Please go ahead and devise the best system that you can conceive. Note that you are not allowed to change the main file in the archive, that is encoder and decoder can only exchange binary sequences.