

A Study on the Development and Implementation of the Remote Control Unit of Microscope used in the Telepathology System

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Abstract

Recently there are rapid developments in Hospital Information System using Information Technology like PACS, EMR. For Example it has been common case that the hospital of a large size uses PACS applying picture compression and network technology.

The Telepathology System can make a correct diagnosis without direct contacts between patients and doctors. It enables them to diagnose correctly by using CCD camera, microscope, control computer and network technology.

This research realize the tele-medical treatment for pathology using a CCD camera and a microscope. And in this paper it is presented the importance, the function, the specification of the Remote Control Unit of Microscope.

1. Introduction of Research

The pathology diagnosis is very important subject in the medical field, Because it helps a definite decision about the final medical diagnosis. But There are so many constraints that all hospitals can not make a daignosis. The major constraints are costs and high-quality human resources. The management of pathology room needs a great expense and there are a few trained mediacd doctors for pathological diagnosis.

Even though medium and small hospital have the ability of operation and treatment, they can't make a operation and treatment for these reasons. The telepathology system enable them to make a diagnosis by using CCD camera and tele-operatioonal microscope.

2. Organization of Telepathology System

The telepathology System is composed of three subsystems.

- **Image Processing system**

: It acquires an image by 3-CCD camera. An Acquired image is sent to a frame-grabber board

and provides the medical doctor with pathological cell image. The image from microscope is transferred by TCP/IP and presented in a Webpage.

SONY 3-CCD camera and Integral FlashPoint 128 grabber board is used in the prototype. And JPEG algorithm is used for efficient image transmission.

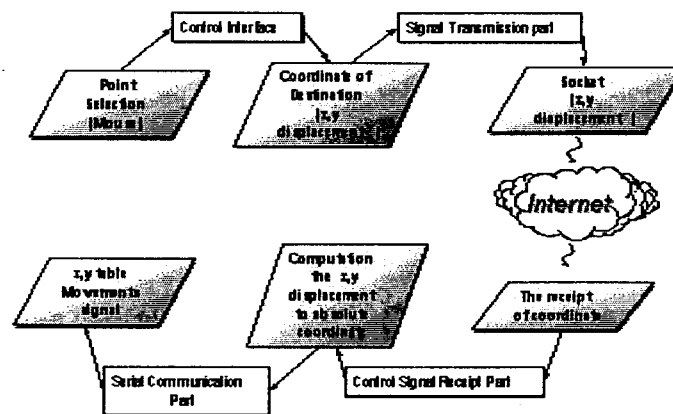
- **Pathological Information Processing system**

: It provides the doctors with medical information like the name, the number of HIS the name of chief physician and the Gross description etc. For the interactive web, ASP programming is used.

- **Remote Control of microscope system**

It enables the doctors to manipulate the microscope in a long distance.

3. Functional Structure of Remote Control Unit of Microscope



4. Conclusion

There are still some problems in Remote Control Unit of the microscope. The control of x-y table minutely and the swing of arm is major problem.

Futhermore the movements of the prototype is just 2-Dimension. since the focusing problem is not solved yet. for this problem the movements of Z-axis must be developed and the problem of munuteness and swing also should be developed..

References

- [1] "The Draft of Digital Imaging and Communication in Medicine", National Electrical Manufacturers Association, Part1, 1998
- [2] "The Draft of Digital Imaging and Communication in Medicine", National Electrical Manufacturers Association, Part2, 1998
- [3] James , "TCP/IP NETWORKING", PTR PRENTICE HALL, 1994
- [4] William Stallings, "Data and Computer Communications", SAMS, 1993
- [5] Pimentel, "Communication Networks for Manufacturing", PRENTICE-HALL, 1996
- [6] Dimitris N.Chorafas, "Designing and Implementing Local Area Network", Mcgraw Hill, 1985
- [7] Joe Campbell, C Pogrammers Guide to Serial Communications, SAMS, 1993
- [8] "Medical Infomation Cerninar", medinfo '98, compaq, 1998.