

ENGN 4612 : DSPC

Project Description

Investigation of DSP devices in WCDMA RAKE receivers

- **Group Members**

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- **Introduction**

The CDMA digital mobile technology specification was developed by an American company named Qualcomm. It stands for Code Division Multiple Access. This technology uses the spread-spectrum technique in which the whole spectrum is fully utilised by each channel. It is a widely used 2G mobile system along with GSM.

WCDMA (wideband CDMA) is a type of 3G mobile specification which incorporates the air interface of CDMA system on the basic GSM system. It uses 5 MHz frequency band and are currently able to reach data rate of 2Mb/s.

In the CDMA system, RAKE receivers are used to provide the capability in using signals with different time delay. It is an essential part of the CDMA base station. In the past, this component was produced with FPGA or ASIC technology. However, with the recently development in DSP technology, the DSP only software defined base station has become an ever popular option due to the reduction in cost and increase in speed.

In this project, we will investigate the use and implementation of DSP application in RAKE receiver.

- **Aims of the project**

- Understanding of generic Block Diagram of WCDMA Base Station
- Investigate key aspects of WCDMA with respect to the objective of understanding the rake receiver
- Investigate the function and operation of the rake receiver
- Understand implementation of WCDMA rake receiver on DSP chip, focusing on Texas Instrument TMS320C62x DSP Device

- **Group responsibilities**

We have decided that the responsibilities will be shared amongst the group members. We will use our previous project experiences to make the group work in the best conditions.

- **Key reference**

http://www.eettaiwan.com/ARTICLES/2001MAY/PDF1/2001MAY23_RFD_DSP_AN1359.PDF