Schedule Report

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December 4, 2014

Contents

Original Plan

Plan A

Learn the knowledge of MAC layer and communication protocol under $60GHz$.

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Plan B

Understand the theory of OFDM communication model under $60GHz$ system, and make the Matlab code operating normally and successfully. I will need everyone's help as you smart guys. and I really appreciate your answer, and it will truly help me a lot.

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Rate of Progress 70%

- *Accomplishment* 1
  I have browsed the PHY Layer frame structure in the document IEEE 802.15.3c, but not quite clear in my mind.
  I think HSI PHY is available for communication and localization. As the High Speed Interface mode of mmWave PHY (HSI PHY) is designed for devices with low-latency, bidirectional high-speed data and uses orthogonal frequency domain multiplexing (OFDM). HSI PHY supports a variety of modulation and coding schemes (MCSs) using different frequency- domain spreading factors, modulations, and LDPC block codes.

Rate of Progress 70%

- *Table 1-Timing-related parameters*

Parameters	*Description*	*Value*	*Formula*
f_s	Reference sampling reate/chip rate	$2640MHz$	
T_C	Sample/chip duration	$\sim 0.38ns$	$1\backslash f_s$
N_{sc}	Number of subcarriers/FFT size	512	
N_{dsc}	Number of data subcarriers	336	
N_P	Number of pilot subcarriers	16	
N_G	Number of guard subcarriers	141	
N_{DC}	Number of DC subcarriers	3	
N_R	Number of reserved subcarriers	16	
N_U	Number of userd subcarriers	352	$N_{dsc} + N_P$
N_{GI}	Guard interval length in samples	64	
Δf_{sc}	Subcarrier frequency spacing	5.15625 MHz	$f_s \backslash N_{sc}$
BW	Nominal used bandwidth	1815 MHz	$N_U \times \Delta f_{sc}$
T_{FFT}	IFFT and FFT period	$\sim 193.94ns$	$1\backslash \Delta f_{sc}$
T_{GI}	Guard interval duration	$\sim 24.24ns$	$N_{GI} \times T_C$
T_S	OFDM Symbol duration	$\sim 218.18ns$	$T_{FFT} + T_{GI}$
F_S	OFDM Symbol rate	$\sim 4.583MHz$	$1\backslash T_S$
N_{CPS}	Number of samples per OFDM symbol	576	$N_{sc} + N_{GI}$

Rate of Progress 70%

- *Table 2-OFDM frame-related parameters*

Parameters	*Description*	*Value*	
N_{pre}	Number of symbols in the PHY preamble(512 chips long)	Long Preamble	16
		Short Preamble	6.75
T_{pre}	Duration of the PHY preamble	Long Preamble	$\sim 3.15\mu s$
		Short Preamble	$\sim 1.31\mu s$
T_{HDR}	Duration of the header	Main header only for MCS 0	$\sim 7.64\mu s$
		Main header only for MCS1-11	$\sim 0.22\mu s$
		Main header and optional header for MCS 0	$\sim 17.89\mu s$
		Main header and optional header for MCS1-11	$\sim 0.44\mu s$
N_{OSMF}	Number of OFDM symbols in the MAC frame body	variable	
T_{OSMF}	Duration of the MAC frame body	$N_{OSMF} \times T_S$	
N_{frame}	Number of OFDM symbols in the frame	$N_{pre} + N_{HDR} + N_{OSMF}$	
T_{frame}	Duration of the frame	$T_{pre} + T_{HDR} + T_{OSMF}$	

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Rate of Progress 70%

- *Accomplishment 2*

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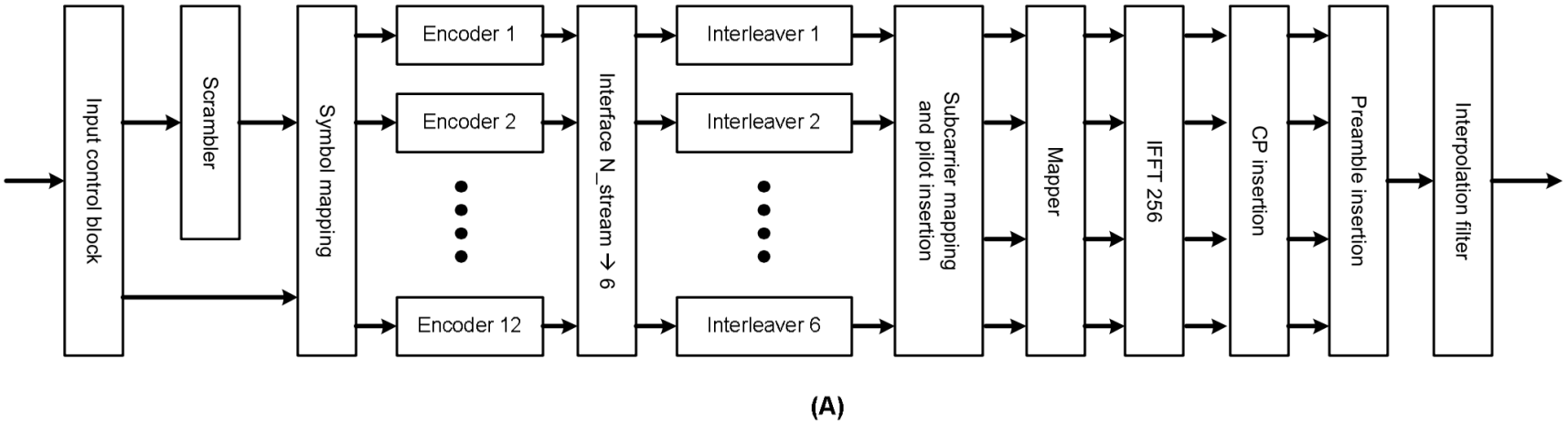
  - I have read three pieces of articles. One is *"A synchronization scheme for OFDM-based 60GHz WPANs"*(a low-complexity synchronization and channel esti- mation scheme,a new preamble structure); one is *"Research on compressed sensing in 60GHz channel estimation"*(L_1, L_0,Cluster Sparsity Compressed Sensing method); another is *"Investigation of passive location techniques based on OFDM signal"*(synchronization based on CP or pilot training sequence Unfinished)

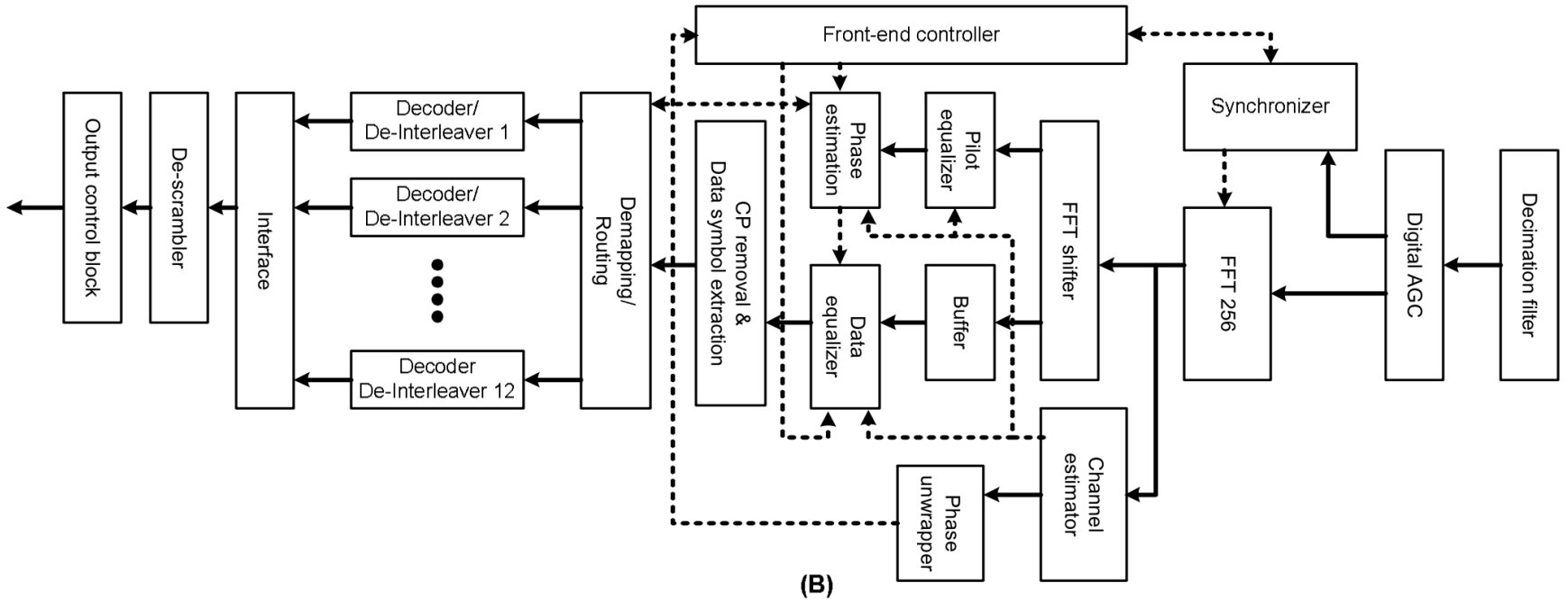
Rate of Progress 70%

- *Accomplishment* 2
  - I have read three pieces of articles. One is *"A synchronization scheme for OFDM-based 60GHz WPANs"*(a low-complexity synchronization and channel esti- mation scheme,a new preamble structure); one is *"Research on compressed sensing in 60GHz channel estimation"*(L_1, L_0,Cluster Sparsity Compressed Sensing method); another is *"Investigation of passive location techniques based on OFDM signal"*(synchronization based on CP or pilot training sequence Unfinished)
- OFDM transmitter and receiver

Rate of Progress 70%



(A)



(B)

Contents

Goal

1. Complete the unfinished article.

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2. Read other three pieces of paper on localization based on OFDM modulation, and set about writing Matlab code if possible.

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1. Complete the unfinished article.
2. Read other three pieces of paper on localization based on OFDM modulation, and set about writing Matlab code if possible.
3. Web page test for bugs. ...

Acknowledgement

Hello! UWB Lab!