

# Performance evaluation and simulation of the physical layer of an embedded communications system in LabVIEW



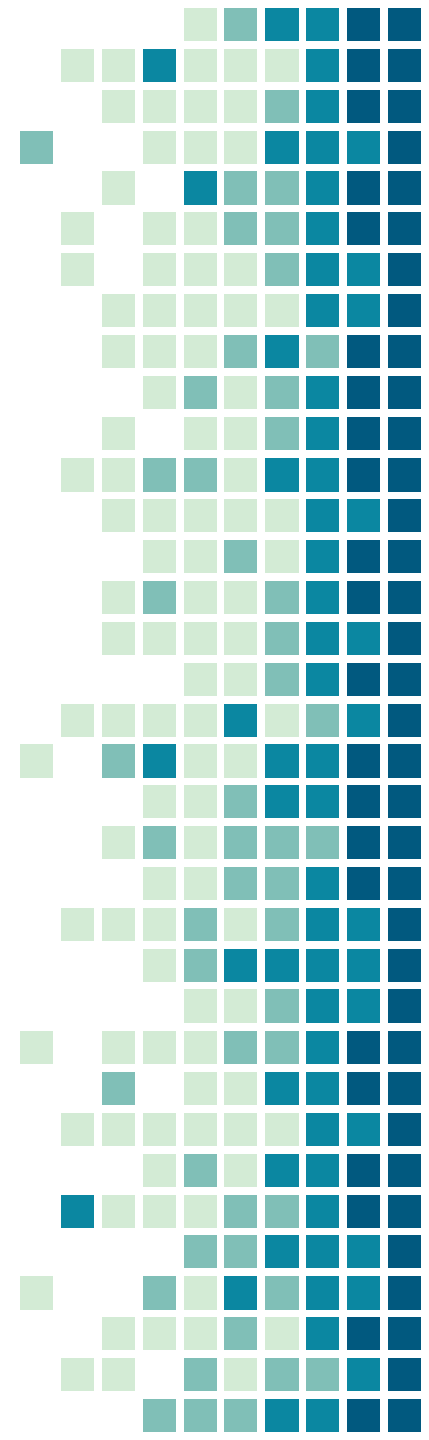


**Maroua Manai**

**Master of Computer Science**

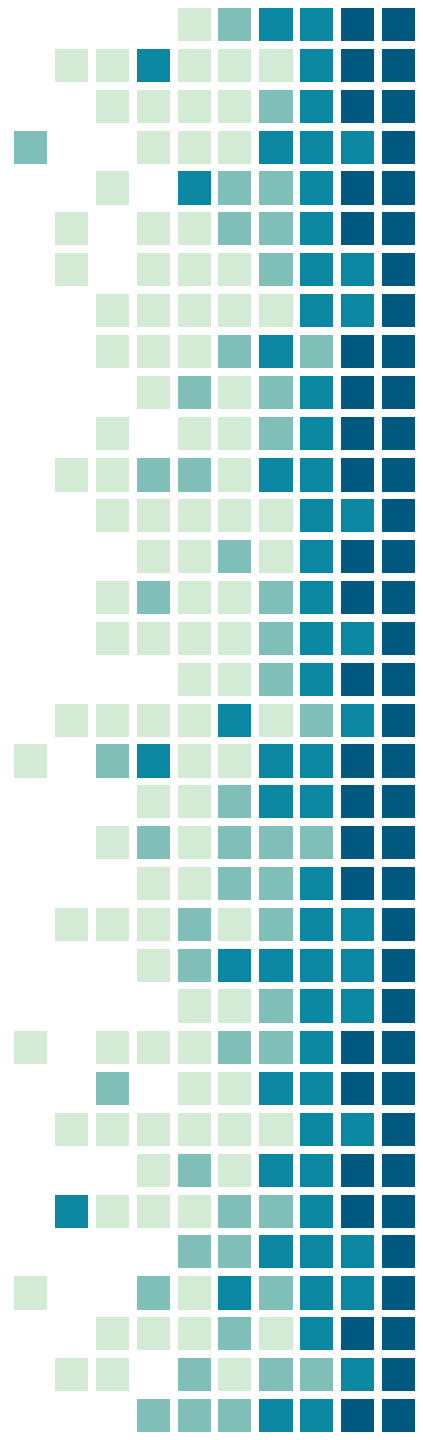
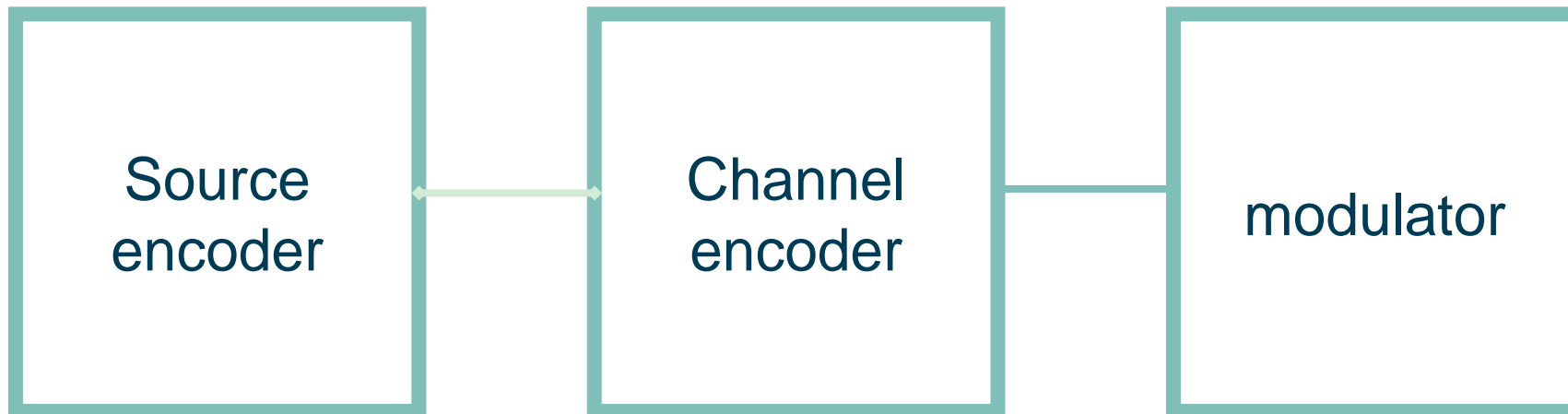
**Project laboratory 2**

**Mr.Tamas Krebesz**



“ Our goal is to evaluate and analyze the received signal from a BPSK communication system in the presence of noise using Labview simulation

# block diagram of the transmitter

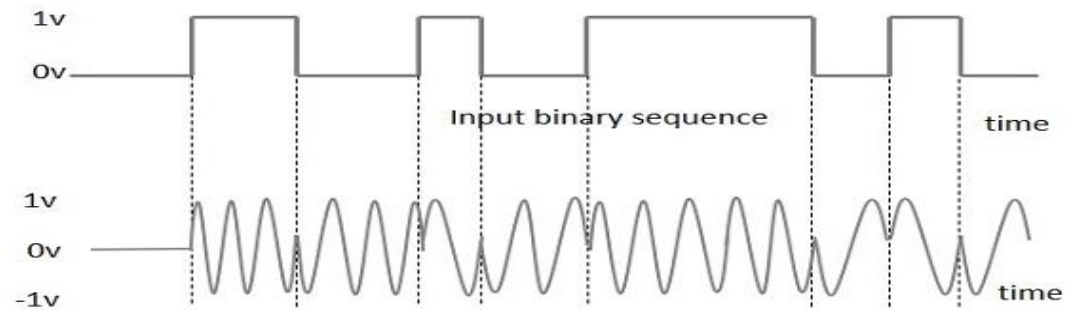


# BPSK modulation

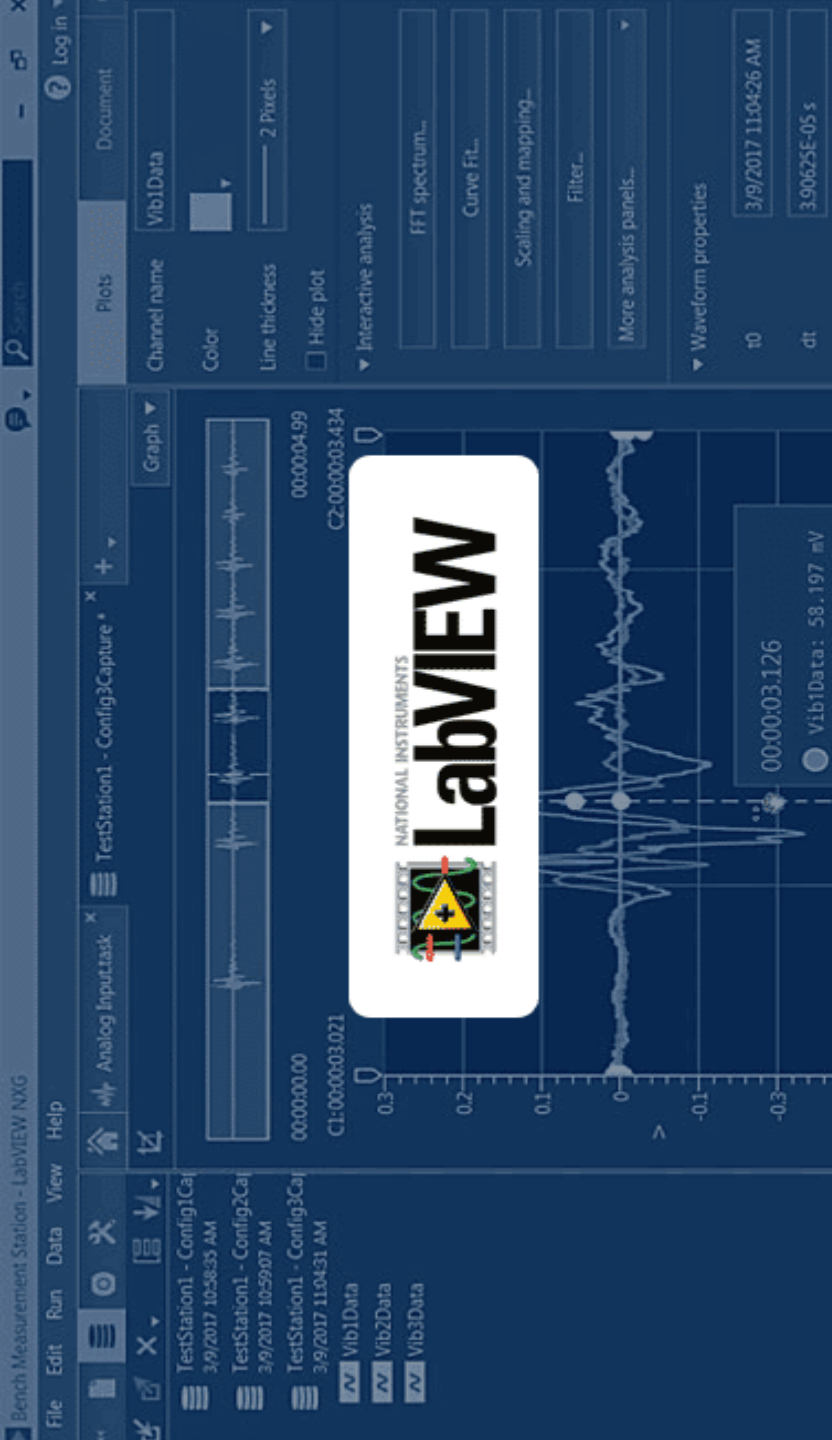
$$s_n(t) = \sqrt{\frac{2E_b}{T_b}} \cos(2\pi ft + \pi(1 - n)), \quad n = 0, 1$$

$$s_0(t) = \sqrt{\frac{2E_b}{T_b}} \cos(2\pi ft + \pi) = -\sqrt{\frac{2E_b}{T_b}} \cos(2\pi ft) \text{ for binary "0"}$$

$$s_1(t) = \sqrt{\frac{2E_b}{T_b}} \cos(2\pi ft) \text{ for binary "1"}$$

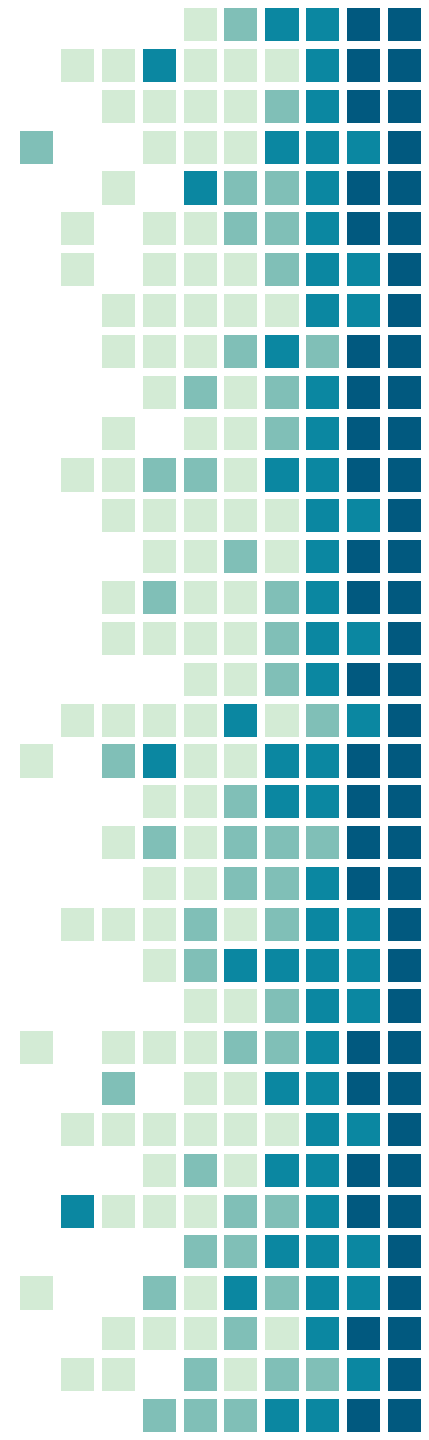


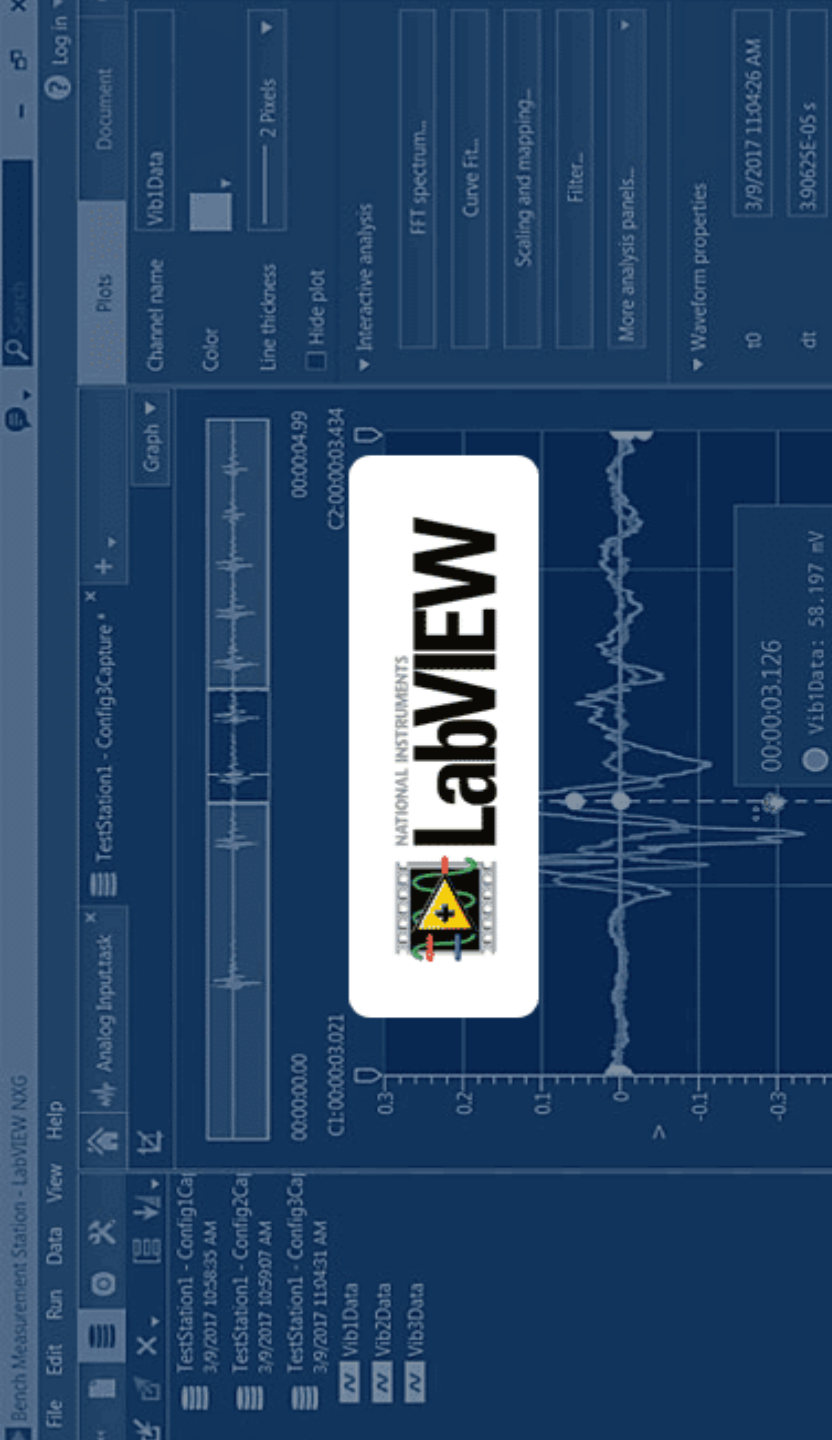
BPSK Modulated output wave



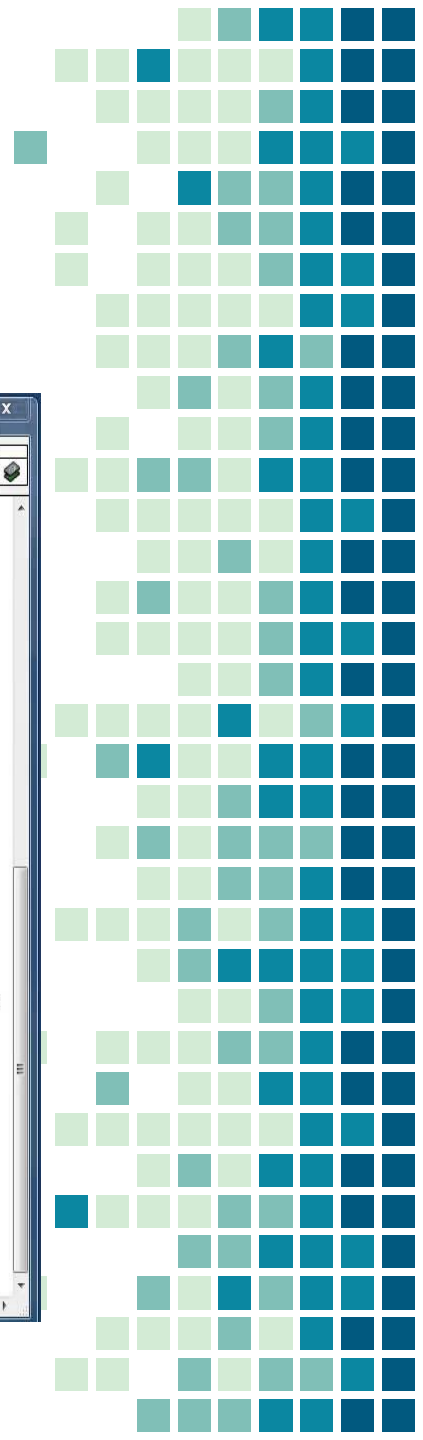
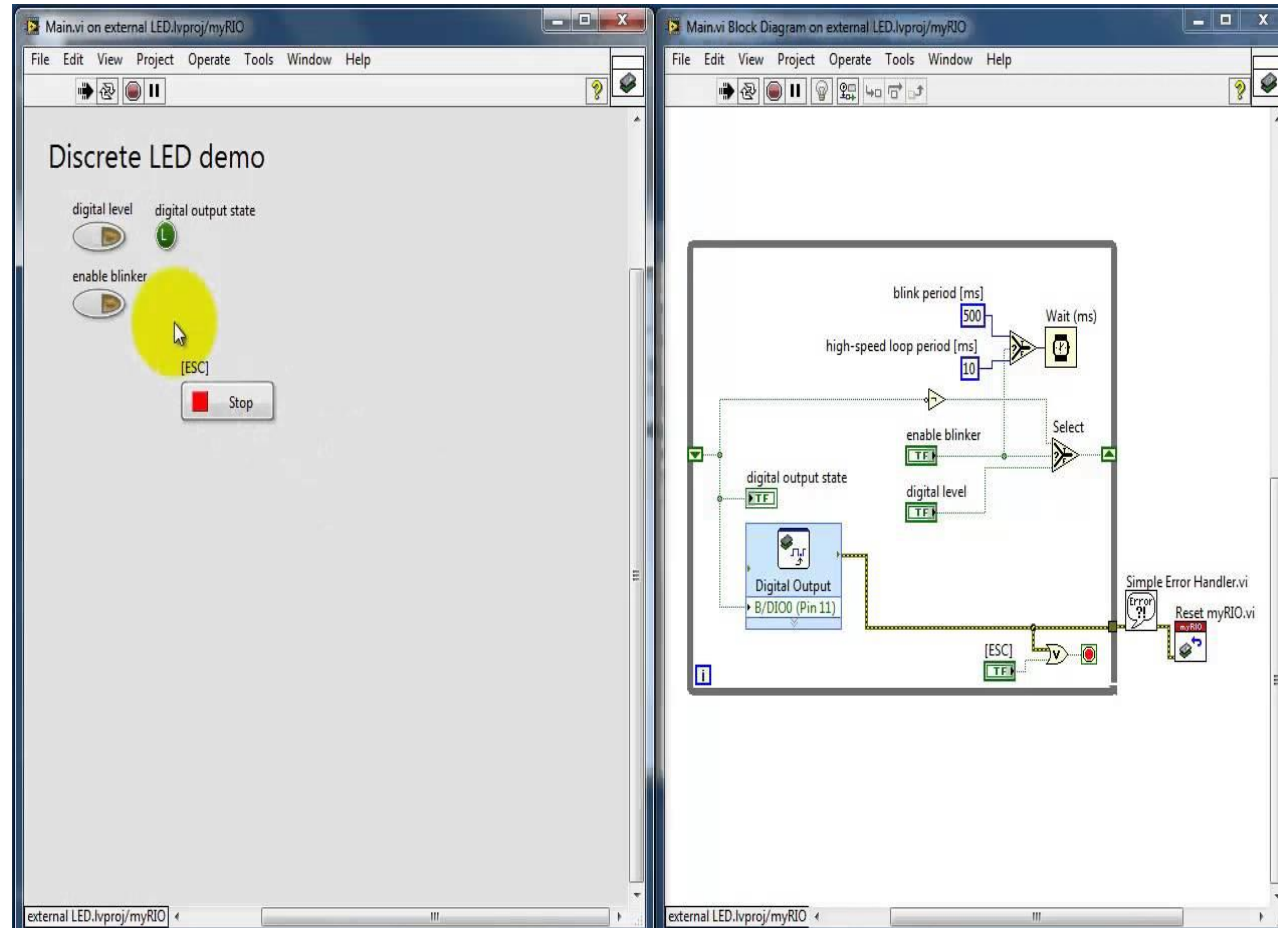
# Labview

- ❖ Laboratory Virtual Instrument Engineering Workbench
- ❖ A platform for research and development (R&D) in academia
- ❖ LabVIEW is essentially an environment that enables programming in G
- ❖ Graphical interface is flexible and simple to use.
- ❖ Provides also a host of facilities including debugging, automated multithreading, hardware management and interface for system design

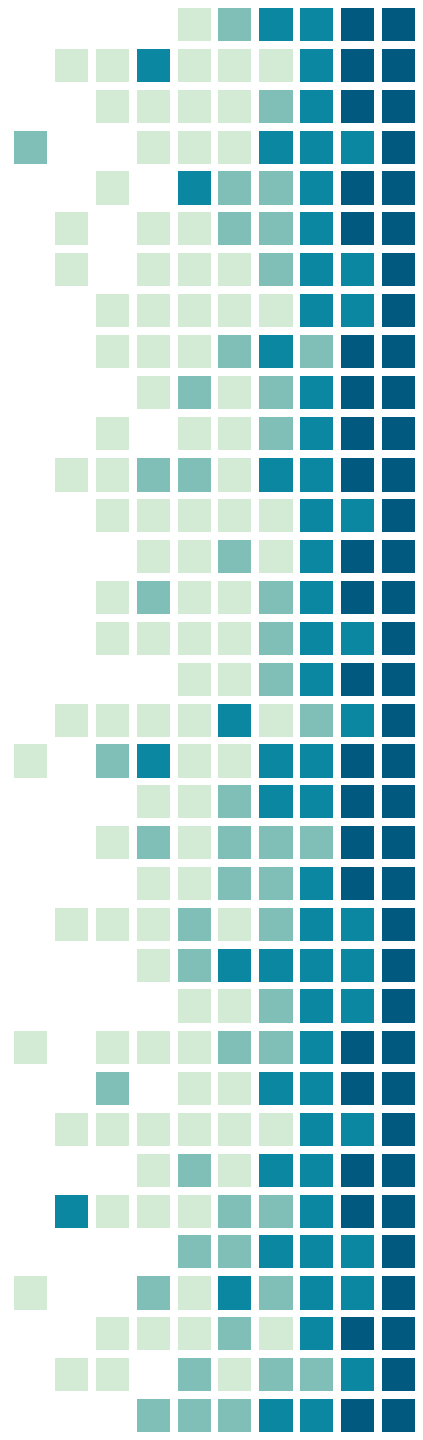
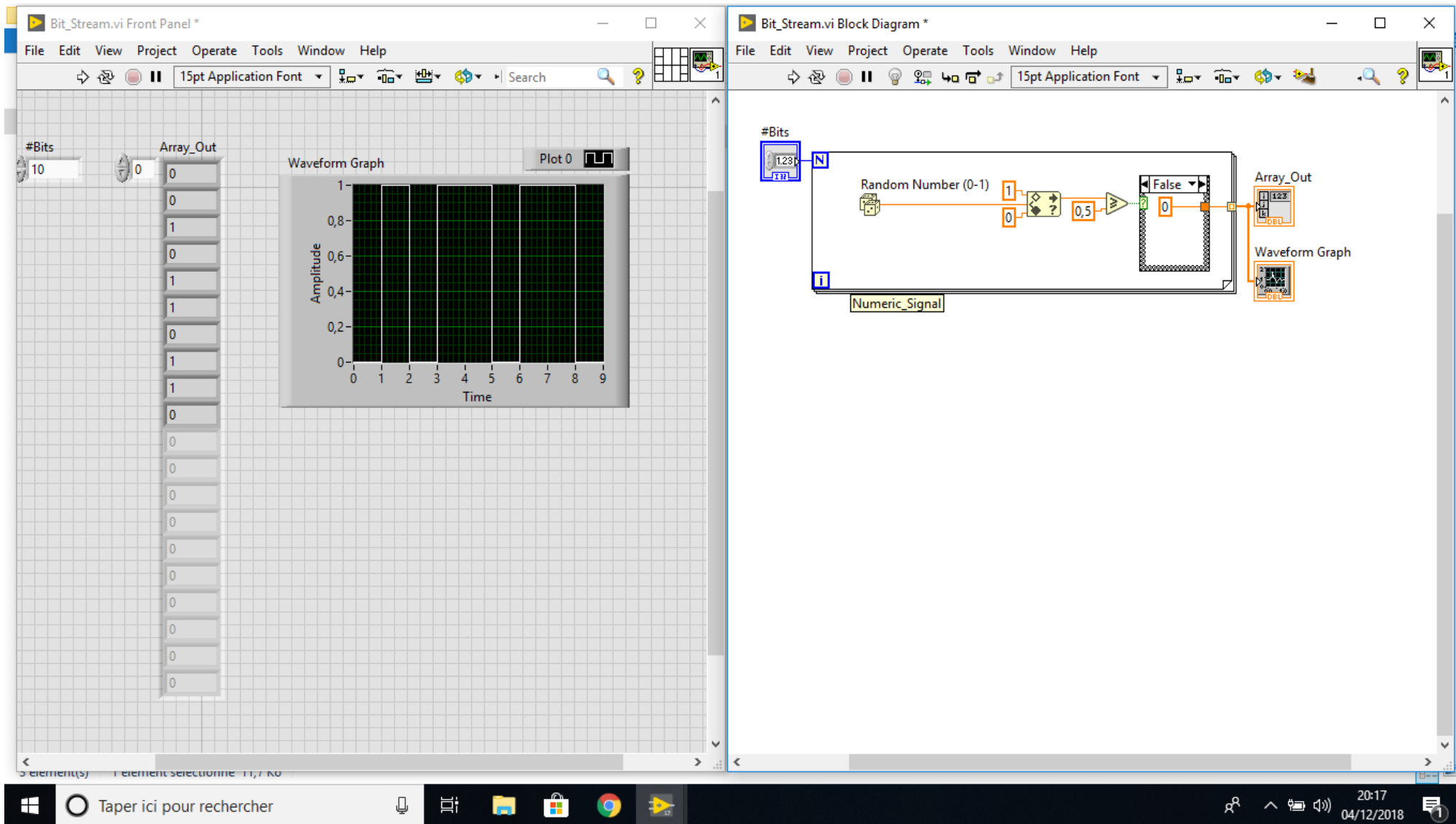




# Labview

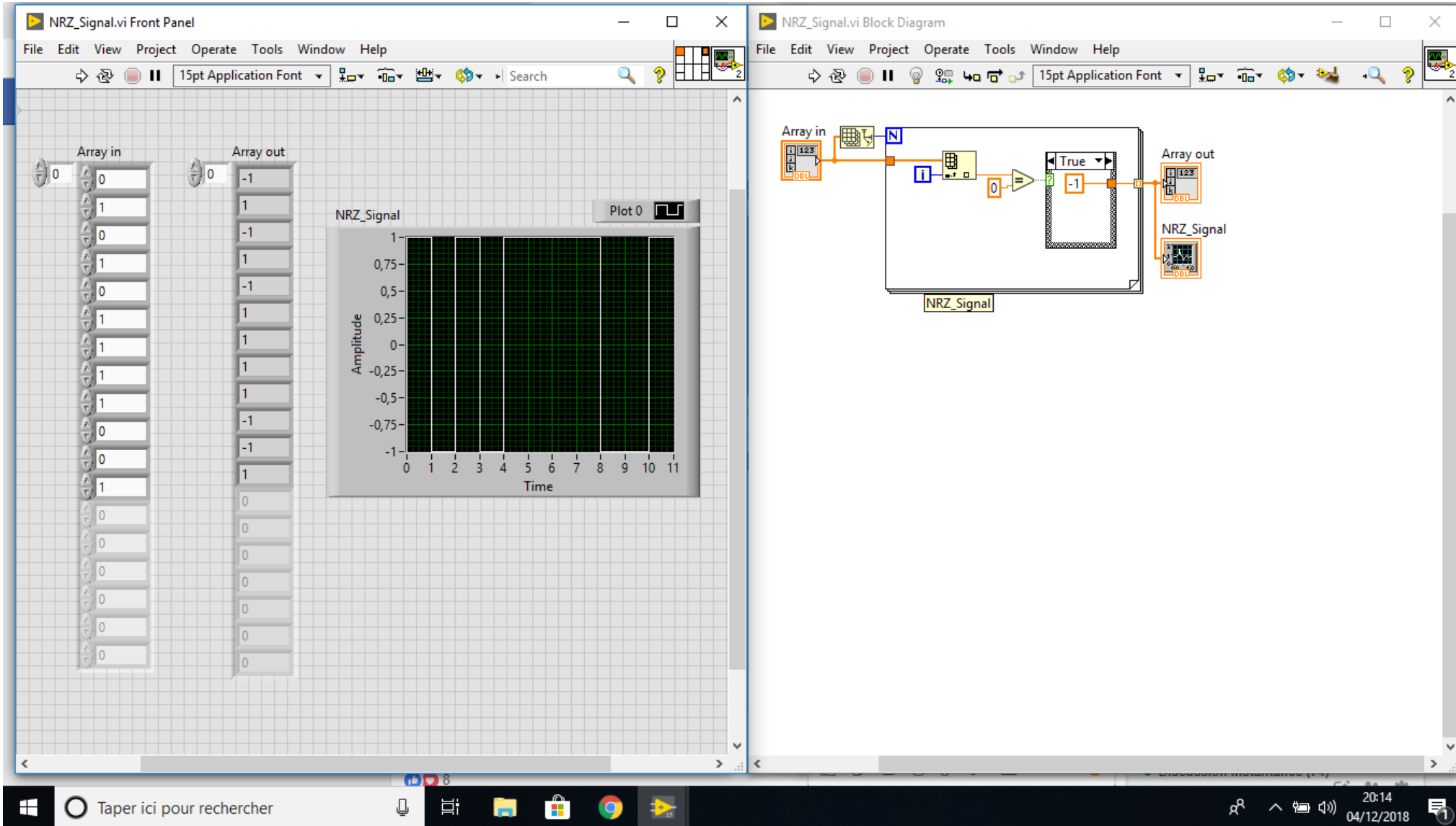


# Random bit stream

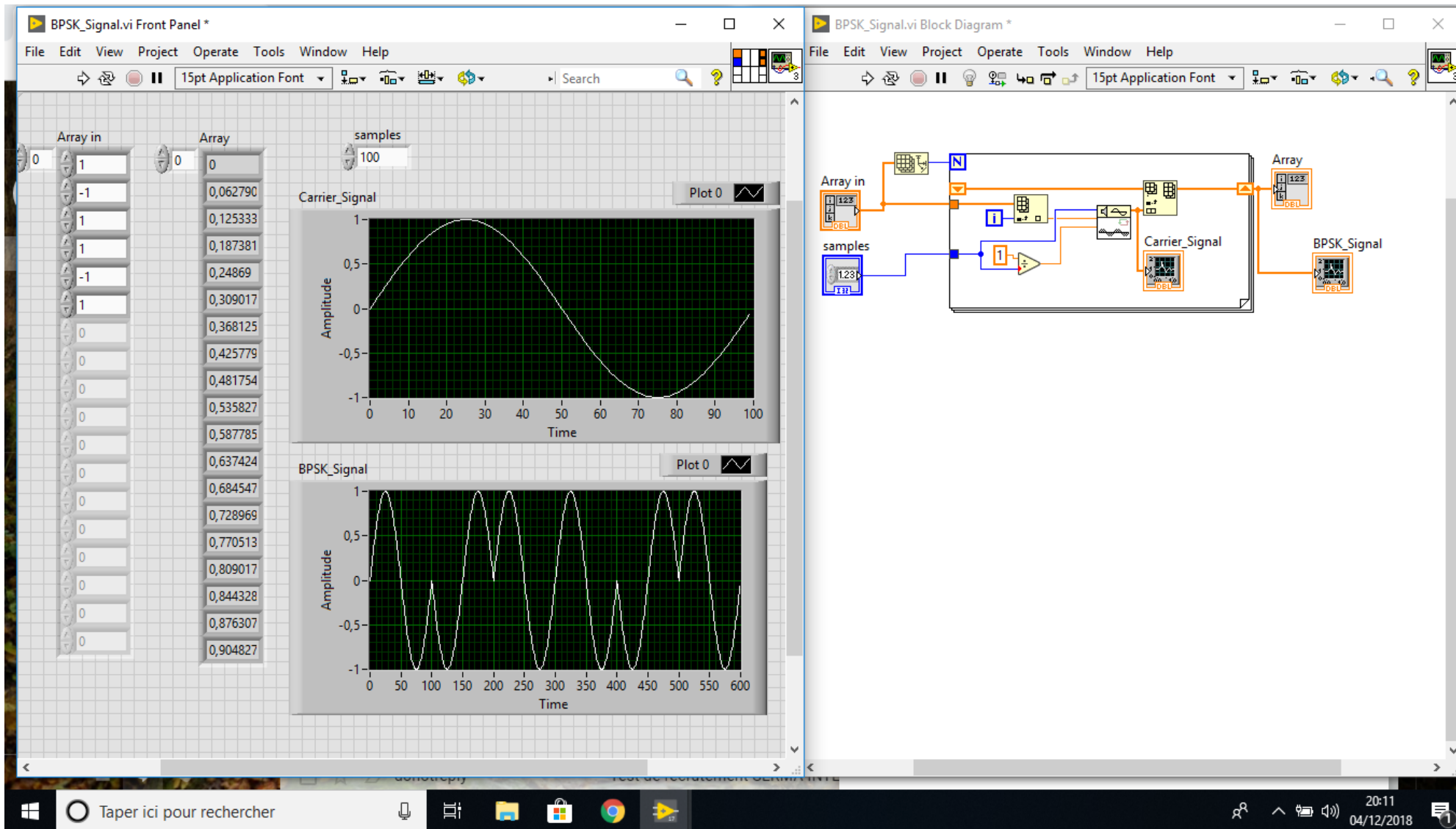




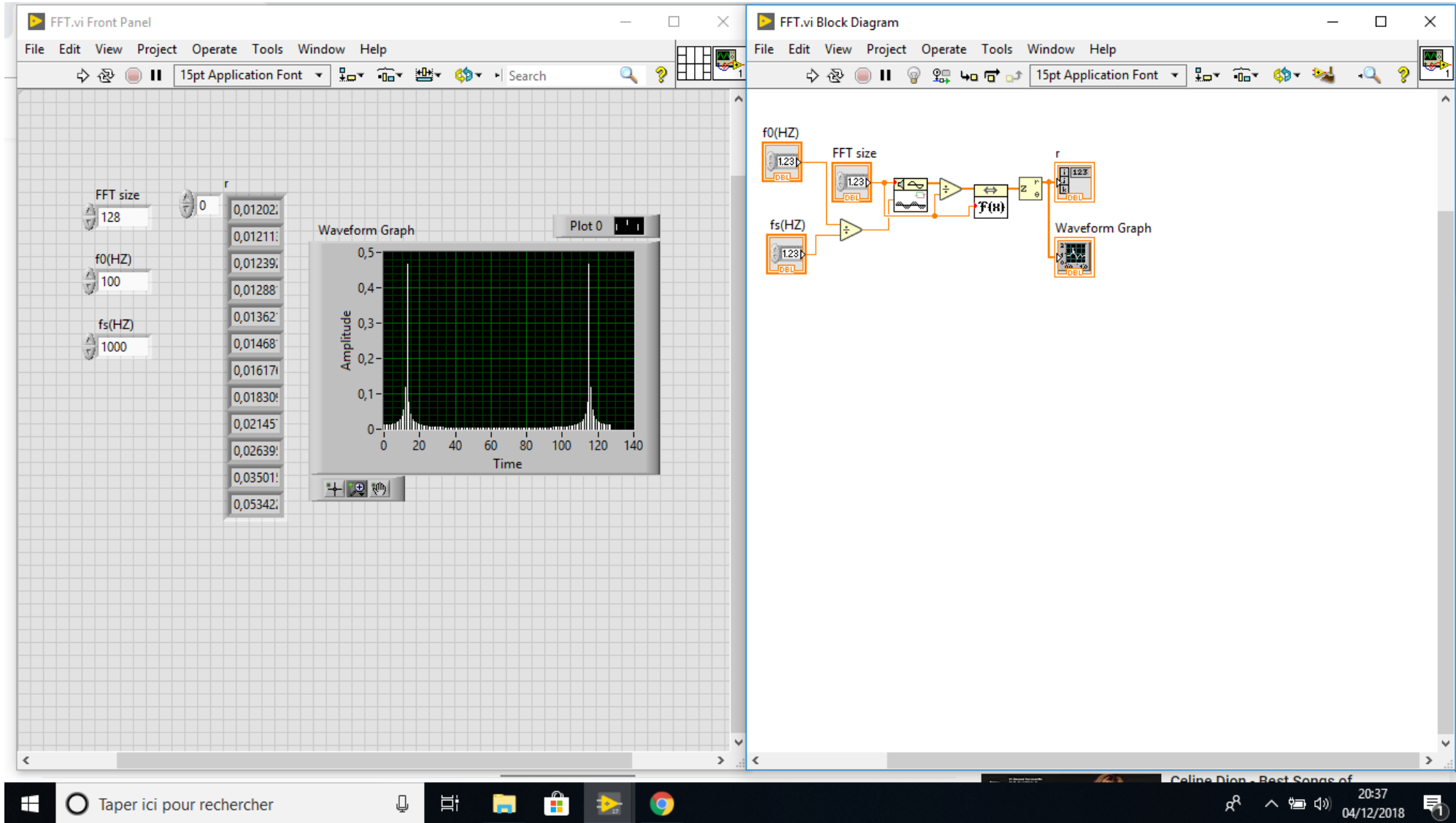
# Analog waveform



# BPSK modulation



# Fourier Transformation



Further works

implement the receiver in  
Labview

implementation of the AWGN  
channel

choose a processing algorithm for  
communication

analyze the final result

# THANKS!

Any questions?

