

# Khodor Safa

PHD STUDENT · TELECOMMUNICATIONS DEPARTMENT

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## Education

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### CentraleSupélec

PHD IN NETWORK, INFORMATION AND COMMUNICATION SCIENCES

- Supervisors: Dr. Raul de Lacerda, Prof. Sheng Yang

Gif-Sur-Yvette, France

Oct. 2021 - Nov. 2024

### CentraleSupélec

M2 RECHERCHE - ADVANCED WIRELESS COMMUNICATION SYSTEMS

Gif-Sur-Yvette, France

Sep. 2020 - Sep. 2021

### American University Beirut

BACHELOR IN ELECTRICAL & COMPUTER ENGINEERING

Beirut, Lebanon

Sep. 2014 - Jun. 2018

## Professional Experience

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### Nokia Bell Labs

RESEARCH ENGINEER INTERN

- Investigated new modulation schemes on the physical layer level for sub-THz band communications which form potential candidates for 6G wireless systems in order to mitigate impairments such as phase noise and high PAPR.

Nozay, France

Apr. 2021 - Oct. 2021

### Philip Morris International

ASSOCIATE IT ANALYST

- Identified, installed and provided support for the Direct Retail POS hardware infrastructure for the Lebanese market IQOS corner-shops launch.
- Designed, coordinated and executed migration plans for office users in Egypt & Levant from on-premise to O365 solutions.

Beirut, Lebanon

Sep. 2018 - Aug. 2020

### National Instruments

APPLICATION ENGINEER INTERN

- Designed a framework and different signal processing techniques for the detection of car key jammers.

Beirut, Lebanon

Jun. 2017 - Aug. 2017

## Academic Projects

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### CentraleSupélec

M2 RESEARCH PROJECT - EMBRACING NON-LINEARITIES IN FUTURE WIRELESS COMMUNICATIONS

VIA NON-CONVEX OPTIMIZATION

- Investigated techniques to improve data detection in a communication channel with phase noise.
- Supervisors: Dr. Khac-Hoang Ngo, Prof. Sheng Yang.

Gif-Sur-Yvette, France

### American University of Beirut

BACHELOR FINAL YEAR PROJECT - FM BASED PASSIVE RADAR

- Investigated, designed and applied the hardware and signal processing setups for the real-time range and velocity detection of commercial aircraft in a group project.
- Supervisor: Prof. Ibrahim Abou-Faycal.

Beirut, Lebanon

## Publications

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### PUBLISHED

- K. Safa**, R. De Lacerda and S. Yang, "Channel Estimation and Data Detection in MIMO channels with 1-bit ADC using Probit Regression," *2023 IEEE Information Theory Workshop (ITW)*, Saint-Malo, France, 2023, pp. 457-461.
- K. Safa**, M. S. Hassan, F. Jardel and P. Sehier, "Low PAPR Probabilistically Controlled Transitions Scheme," *2022 IEEE Wireless Communications and Networking Conference (WCNC)*, Austin, TX, USA, 2022, pp. 2184-2189.
- K. Safa**, R. Combes, R. de Lacerda and S. Yang, "Data Detection in 1-bit Quantized MIMO Systems," in *IEEE Transactions on Communications*, vol. 72, no. 9, pp. 5396-5410, Sept. 2024

### PATENTS

- M. Sayed Hassan, **K. Safa**, F. Jardel, "Generalized Low PAPR Transition Controlled Transmission Scheme", US20240340209, 10 Oct. 2024.

## Awards and Scholarships

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- 2023 **L2S Best PhD Student Presentation Award - Telecoms & Networks session**,  
Laboratoire des Signaux et Systèmes (L2S)
- 2021 **Bell Labs Summer Intern Award for Outstanding Innovation**,  
Nokia Bell Labs
- 2020 **Idex Scholarship**,  
Paris-Sclay University
- 2014 **University Scholarship Program V**,  
United States Agency for International Development (USAID)

## Presentations

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- K. Safa**, R. De Lacerda and S. Yang, "Data Detection in 1-bit Quantized MIMO Systems", *Junior Conference on Wireless and Optimal Communications*, Oral presentation, Oct. 2023, Gif-Sur-Yvette, France.
- K. Safa**, R. De Lacerda and S. Yang, Oral presentation "Data Detection in 1-bit Quantized MIMO Systems", *L2S PhD Students Day*, Oral presentation, Sep. 2023, Gif-Sur-Yvette, France.
- K. Safa**, R. De Lacerda and S. Yang, Oral presentation "Channel Estimation and Data Detection in MIMO channels with 1-bit ADC using Probit Regression", *ITW 2023 Conference Presentation*, Oral presentation, Apr. 2023, Saint-Malo, France.
- K. Safa**, M. S. Hassan, F. Jardel and P. Sehier, "Low PAPR Probabilistically Controlled Transitions Scheme," *2022 IEEE Wireless Communications and Networking Conference (WCNC)*, Recorded Online Presentation, Apr. 2022

## Teaching Experience

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| 2022 - 2024 | <b>Communications Theory</b> ,<br>Conducted practical sessions for second year engineering students   | Centrale-<br>Supélec |
| 2022 - 2024 | <b>MIMO Communications</b> ,<br>Conducted practical sessions for third year engineering and Masters students  | Centrale-<br>Supélec |
| 2023 - 2024 | <b>Information Theory</b> ,<br>Conducted theoretical and practical sessions for first year engineering students   | Centrale-<br>Supélec |
| 2022 - 2023 | <b>Animation Ateliers Projet Professionnel/Individuel (APP/API)</b> ,<br>Animated and supervised sessions for second year engineering students to help them prepare their professional projects | Centrale-<br>Supélec |

## Extra-curricular Activities

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2016 - 2017	<b>Community Based Project: Art for Growth</b> , Project Planner Volunteer	<i>Beirut, Lebanon</i>
2017-2018	<b>Supporting Education Project with MMKN NGO</b> , Teacher Volunteer for high-school students	<i>Beirut, Lebanon</i>