

# Jehad M. Hamamreh (Cahit)

(Curriculum Vitae - CV)

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## Hammareh's Brief Bio.

Dr. Jehad Hamamreh joined Antalya Bilim University in September 2018 as a research and development professor at the Faculty of Engineering, Department of Electrical and Computer Engineering (ECE), where he later became the ECE department head of Postgraduate Studies in 2023. Before his current position, he was affiliated with the School of Engineering and Science at Istanbul Medipol University, and before that, he worked with Texas A&M University in the ECE department. He is an experienced academician with more than six years of teaching and more than eleven years of research experience. Dr. Hamamreh has contributed to his research portfolio by securing funds from the government and industry for several R&D projects and publishing more than 100 leading, peer-reviewed papers and articles in international venues and technical journals. Dr. Hamamreh has taught various courses both at the undergraduate and graduate levels, including but not limited to Wireless Communications, Wireless Security, Physical Layer Security, Advanced Open Radio Systems (5G/6G), IoT Systems and Applications, Python AI for wireless digital communications, and Computer Networks. He also presented his research at various leading conferences around the globe. He has supervised more than 20 graduate students on their theses and published multiple research papers with his students. Furthermore, he is also an editor and reviewer for multiple well-known international journals. Dr. Hamamreh is also an inventor of more than 15 Patents, mostly known as the inventor of cross-layer keyless perfect secrecy, Number Modulation, and Power Modulation in OFDM and MIMO systems, as well as Advanced NOMA. He is the author of more than 100 peer-reviewed scientific papers along with 3 main books and 7 book chapters in 5 different books. He has supervised and mentored many international Master's and PhD students and led several funded research projects as the main principal investigator. He received the top researcher award of ABU three times: 2018, 2021, 2022. Attended in the list of top 10000 researchers prepared by the international ranking organization AD Scientific Index. He has an h-index of 21 with around 2000 citations.

## Areas of Expertise and Speciality

Wireless Communications, Wireless Security, IoT, O-RAN 4G/5G Networks, Web Technologies, Signal Processing, Data Analytics, Artificial Intelligence, and Embedded Systems. On the research side, part of my work has been focused on the design of novel advanced and effective transmission methods with joint PHY-MAC-NET layer security features; multicarrier waveforms development such as OFDM, OTDM, and OTFS; advanced AI-based multiple-input multiple-output (MIMO) systems, new spectral and power-efficient modulation techniques such as position/index, number/gap, and power/shape modulation; and non-orthogonal superposition-based multiple access schemes such as SS-NOMA for meeting the requirements of future IoT-AI applications and xG wireless communication networks. (Web: <https://wislabi.com/>).

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## Experience

2018–Present **R&D Professor, Antalya Bilim University, Antalya**

I have been conducting research and teaching graduate master level and 3rd-4th years undergraduate level courses related to wireless communications digital systems, wireless security, computer networks, IoT, and 5G/6G systems. I have also been supervising students in their dissertations and projects as well as conducting research on advanced topics on wireless security and telecommunication systems (6G and beyond) in addition to developing signal processing designs for physical layer security. More than 10 students have successfully graduated under my supervision and got positions in leading international universities and companies around the world. I have also been acting as the head of the electrical and computer engineering department for graduate studies since September 2023.

2019–Present **Founder, Wislabi.com**

I have been leading and directing the execution of several R&D projects as well as supervising and mentoring tens of Master and PhD researchers. In addition, I have been providing professional consultation services to Telecom companies on topics related to wireless communication systems, wireless security, 4G/5G networks, Open RAN, IoT, and ML/AI based solutions. I have also been supervising and guiding many international researchers overseas in their projects and research works. The research theme was mostly focused on producing novel Intellectual Properties and Patents on advanced topics on wireless security and telecommunication systems (5G, 6G and beyond) in addition to developing signal processing designs for providing physical layer security. More than 10 national and international companies have been receiving consultations from our lab and more than 30 researchers have been mentored by me directly and later got positions in leading international universities and companies around the world.

Sep. 2014 – **PHD Researcher, Istanbul Medipol University (IMU), Istanbul**

Aug. 2018 I was working on some high-tech research projects related to physical layer security and advanced 5G waveform design. I was working on designing and developing novel techniques and algorithms that can help solve key technical challenges in future wireless systems. Also, I was in charge of writing scientific research papers and publishing my research findings in international conferences and journals. Besides, I was assigned the responsibility of co-advising and mentoring many PhD students in their research and projects.

Feb. 2014 – **Technical Procurement Engineer, Paltel Company, Nablus**

Sep. 2014 I was in charge of assisting technical directorates in planning and managing the implementation of some high tech projects such as Cloud wireless, 100GBE network, Core replacement, VPN, Intelligent Network, IPDSLAM, VOIP, GPON, FTTH and other related projects via preparing high quality RFP/RFQ. Also, I was participating in technical and business committee meetings to study and evaluate the received offers from multi-vendor in order to make critical decisions regarding whom and which technology should we select.

Jun. 2013 – **Researcher, Texas A and M University at Qatar (TAMUQ), Doha**

Jan. 2014 I was working with the wireless research group of TAMUQ. I was focusing on conducting experiments and doing simulations to produce new innovative solutions related to LTE technology, reconfigurable antenna, channel characterizations, adaptive modulation techniques, Visible Light Communication (VLC), implementation using MATLAB, PCB tools, and hardware devices. During my work, I utilized most of Agilent devices such as network analyzer, scanner devices (TSMW, TSMQ), signal generators, as well as wireless software tools such as Wireless Insite, Antenna Magus and CST simulation software.

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## Education

2014–2018 **Ph.D. in Electrical-Electronics Engineering and Cyber Systems**, *Istanbul Medipol University*, Istanbul, Turkey, Integrated Program - Master with Ph.D.

Supervisor: Prof. Dr. Huseyin Arslan (IEEE Fellow and Former Professor at University of South Florida (USF), Florida, USA)

Published 10 journals, 3 patents, and 7 conference papers (Named Top Performing PhD Graduate).

2008–2013 **B.Sc. in Electrical and Telecommunication Engineering**, *An-Najah National University*, Nablus, Palestine, Ranked among the Top in my Batch

Supervisors: Prof. Allam Mousa (Former Minister of ICT) and Dr. Falah Hasan

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## Ph.D. Thesis

Title *Advanced Cross-Layer Secure Communication Designs for Future Wireless Systems*  
Supervisor Prof. Huseyin Arslan

Description In this thesis, several advanced security designs and techniques are proposed for future 5G and beyond wireless networks. Particularly, the conducted research studies encompass the following main directions: I) Designing cross PHY/MAC layer security techniques using the following approaches: 1) Automatic-repeat-request (ARQ) with adaptive modulation. 2) ARQ with null-space-independent artificial noise. II) Security techniques for OFDM-based waveforms. This includes developing new designs that cover the following topics: 1) OFDM with adaptive interleaving (precoding) and deinterleaving (postcoding). 2) OFDM with subcarrier index selection for enhancing security and reliability of 5G URLLC services. 3) CP-less OFDM with alignment signals for enhancing spectral efficiency, reducing latency, and improving PHY security of 5G and beyond services. III) New inherently secure waveform designs, where a secure channel-based transform waveform, referred to as orthogonal transform division multiplexing (OTDM), is developed for future wireless systems. IV) Security designs for orthogonal space-time block coding (OSTBC)-based MISO systems.

## Publications

### Journal Articles

- 1) J. M. Hamamreh and H. Arslan, "Joint PHY/MAC layer security design using ARQ with MRC and null-space independent, PAPR-aware artificial noise in SISO systems," in IEEE Transactions on Wireless Communications, vol. 17, no. 9, pp. 6190-6204, Sept. 2018.
- 2) J. M. Hamamreh, Abdulwahab Hajar, and Mohamedou Abewa, "Orthogonal Frequency Division Multiplexing With Subcarrier Power Modulation for Doubling the Spectral Efficiency of 6G and Beyond Networks." in Transactions on Emerging Telecommunications Technologies, 2020, 1(1). <https://onlinelibrary.wiley.com/doi/abs/10.1002/ett.3921> <https://doi.org/10.1002/ett.3921>
- 3) A. M. Jaradat, J. M. Hamamreh and H. Arslan, "OFDM With Hybrid Number and Index Modulation," in IEEE Access, vol. 8, pp. 55042-55053, 2020. <https://ieeexplore.ieee.org/document/9042249>
- 4) J. M. Hamamreh, H. M. Furqan, and H. Arslan, "Classifications and Applications of Physical Layer Security Techniques for Confidentiality: A Comprehensive Survey," in IEEE Communications Surveys and Tutorials, vol. 21, no. 2, pp. 1773-1828, Second quarter 2019. <https://ieeexplore.ieee.org/document/8509094> (THIS ARTICLE IS COMPOSED OF 56 DOUBLE-COLUMN PAGES)
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- 6) J. M. Hamamreh, Z. E. Ankarali, and H. Arslan, "CP-Less OFDM with Alignment Signals for Enhancing Spectral Efficiency, Reducing Latency, and Improving PHY Security of 5G and Beyond Services," in IEEE Access, vol. 6, pp. 63649-63663, 2018. <https://ieeexplore.ieee.org/document/8501913>
- 7) J. M. Hamamreh, E. Basar, and H. Arslan, "OFDM-subcarrier index selection for enhancing security and reliability of 5G URLLC services," IEEE Access, vol. 5, pp. 25 863–25 875, 2017. <http://ieeexplore.ieee.org/document/8093591/>
- 8) J. M. Hamamreh and H. Arslan, "Secure orthogonal transform division multiplexing (OTDM) waveform for 5G and beyond," IEEE Communication Letter, vol. 22, no. 5, pp. 1191-1194, Jan. 2017. <http://ieeexplore.ieee.org/document/7814269/>
- 9) A. M. Jaradat, J. M. Hamamreh and H. Arslan, "OFDM with subcarrier number modulation," IEEE Wireless Communications Letters, vol. 7, no. 6, pp. 914-917, Dec. 2018. <https://ieeexplore.ieee.org/document/8362748/>
- 10) H. M. Furqan, J. M. Hamamreh, H. Arslan, "New Physical Layer Key Generation Dimensions: Subcarrier Indices/Positions-Based Key Generation," in IEEE Communications Letters, 2020. <https://ieeexplore.ieee.org/document/9201305>
- 11) E. Guvenkaya, J. M. Hamamreh, and H. Arslan, "On physical-layer concepts and metrics in secure signal transmission," Physical Communication by Elsevier, vol. 25, pp. 14 – 25, Aug. 2017.

<http://www.sciencedirect.com/science/article/pii/S1874490717300903>

12) H. M. Furqan, J. M. Hamamreh, and H. Arslan, "Adaptive OFDM-IM for Enhancing Physical Layer Security and Spectral Efficiency of Future Wireless Networks," *Wireless Communications and Mobile Computing* by Hindawi and Wiley, vol. 2018, Article ID 3178303, 16 pages, 2018. <https://doi.org/10.1155/2018/3178303>.

13) Iqbal, S., Khalid, S., Hamamreh, J. M. (2021). A New MIMO Technique Utilizing Superimposed Auxiliary Signals for Simultaneously Achieving Spatial Multiplexing and Diversity Gains in MIMO-Aided Communication Systems. *RS Open Journal on Innovative Communication Technologies*, 2(4). <https://doi.org/10.46470/03d8ffbd.a04e8f92>

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15) Abuqamar, A., Hamamreh, J. M., Abewa, M. (2021). STBC-assisted OFDM with Sub-carrier Power Modulation. *RS Open Journal on Innovative Communication Technologies*, 2(4). <https://doi.org/10.46470/03d8ffbd.275ae770>

16) Lemayian, J. P., Hamamreh, J. M. (2021). Hybrid MIMO: A New Transmission Method For Simultaneously Achieving Spatial Multiplexing and Diversity Gains in MIMO Systems. *RS Open Journal on Innovative Communication Technologies*, 2(4). <https://doi.org/10.46470/03d8ffbd.549d270b>

17) Abewa, M., Hamamreh, J. M. (2021). NC-OFDM-SPM: A Two-Dimensional Non-Coherent Modulation Scheme for Achieving the Coherent Performance of OFDM along with Sending an Additional Data-stream. *RS Open Journal on Innovative Communication Technologies*, 2(3). <https://doi.org/10.46470/03d8ffbd.a97a5236>

18) Zia, M. F., Furqan, H. M., Hamamreh, J. M. (2021). Multi-cell, Multi-user, and Multi-carrier Secure Communication Using Non-Orthogonal Signals' Superposition with Dual-Transmission for IoT in 6G and Beyond. *RS Open Journal on Innovative Communication Technologies*, 2(3). <https://doi.org/10.46470/03d8ffbd.08b7bd1d>

19) Karatepe, S., Kirik, M., Hamamreh, J. M. (2021). Novel Nonorthogonal Multi-access Method for Multi-user MIMO with Antenna Number Modulation. *RS Open Journal on Innovative Communication Technologies*, 2(3). <https://doi.org/10.46470/03d8ffbd.100fb36f>

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- 29) Hamamreh, J. M., KIRIK, M., SAGMAN, M. O., ISHIKAWA, N. (2020). Multiple Input Multiple Output with Antenna Number Modulation and Adaptive Antenna Selection. *RS Open Journal on Innovative Communication Technologies*, 1(1). <https://doi.org/10.21428/03d8ffbd.f172bd8a>
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- 32) N. Ishikawa, J. M. Hamamreh, E. Okamoto, C. Xu and L. Xiao, "Artificially Time-Varying Differential MIMO for Achieving Practical Physical Layer Security," in *IEEE Open Journal of the Communications Society*, doi: 10.1109/OJCOMS.2021.3112486

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- 35) Hijazi, M., & Hamamreh, J. M. (2021). Convolutional Neural Network Based Equalizer for Improving the Reliability Performance of OFDM with Subcarrier Power Modulation. *RS Open Journal on Innovative Communication Technologies*, 2(5). <https://doi.org/10.46470/03d8ffbd.48b1d1c8>
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- 37) Iqbal, S., & Hamamreh, J. M. (2021). Improving Throughput and Reliability Performance of Future 6G-IoT Communication Systems Using Signal Superposition-based Dual Transmission. *RS Open Journal on Innovative Communication Technologies*, 2(5). <https://doi.org/10.46470/03d8ffbd.ea6725c0>
- 38) Kirik, M., & Hamamreh, J. M. (2021). Multi-User Subcarrier Number Modulation-based OFDM for Future Wireless Communication Networks. *RS Open Journal on Innovative Communication Technologies*, 2(6). <https://doi.org/10.46470/03d8ffbd.92385737>
- 39) Iqbal, S., & Hamamreh, J. M. (2021). A Comprehensive Tutorial on How to Practically Build and Deploy 5G Networks Using Open-Source Software and General-Purpose, Off-the-Shelf Hardware. *RS Open Journal on Innovative Communication Technologies*, 2(6). <https://doi.org/10.46470/03d8ffbd.4ccb7950>
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- 42) Iqbal, S., & Hamamreh, J. M. (2021). Is Cell-Free Massive MIMO (CF-MMIMO) Equivalent to the Already Existing and Commercialized pCell Technology? *RS Open Journal on Innovative Communication Technologies*, 2(6). <https://doi.org/10.46470/03d8ffbd.bbd057a2>
- 43) Ali, H., Khalid, S., Iqbal, S., & Hamamreh, J. M. (2022). Protecting IMSI from Fake Base Stations Exploitation and Spoofer Impersonation in 5G and Beyond Cellular Networks. *RS Open Journal on Innovative Communication Technologies*, 3(7). <https://doi.org/10.46470/03d8ffbd.4f956b48>

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- 51) Hamamreh, J. M., Furkan., & Solajja. (2024). Adaptable Secure Communication Framework for Automobile Intelligent Transportation Systems. *RS Open Journal on Innovative Communication Technologies*. <https://rs-ojict.pubpub.org/pub/e6f2ov6z/>
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### Books

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- 2) Communication Security at the Physical Layer: Principles, Techniques, and Metrics, by Jehad M.



Hamamreh, Published with Amazon KDP, Feb, 24 2023, ISBN-13: 979-8378812639

3) A Novel Transceiver Architecture for Making Polar Codes Work Over Multipath Fading Channels as They Do Over AWGN Channels, by Jehad M. Hamamreh, Published with Amazon KDP, Mar, 22 2019, ISBN-13: 978-1091292277

### Book chapters

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2) J. M. Hamamreh, "An Effective Design for Polar Codes over Multipath Fading Channels", Chapter 1 in the book titled "Smart Cities Performability, Cognition, and Security", Springer, Switzerland AG, 2020. ISBN: 978-3-030-14717-4

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4) F. Al-Turjman, J. M. Hamamreh, "mm-Waves in the Internet of Nano-Things", Chapter 4 in the book titled "Internet of Nano-Things and Wireless Body Area Networks (WBAN)", Published with Taylor and Francis, CRC, New York, 2019.

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14) H. M. Furqan, J. M. Hamamreh, H. Arslan, "Secure and Reliable IoT Communications Using Nonorthogonal Signals' Superposition with Dual-Transmission," IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC), Aug. 31 – Sep. 3, 2020.

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12) Joel P. Lemayian, and Jehad M. Hamamreh, "First Responder Drones for Critical Situation Management," 2019 IEEE Conference on Innovations in Intelligent Systems and Applications (ASYU 2019), Izmir, 2019, pp. 1-6. <https://ieeexplore.ieee.org/document/8946353>

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10) Abdulwahab Hajar, Jehad M. Hamamreh, Mohamedou Abewa, and Youcef Belallou, "A Spectrally Efficient OFDM-Based Modulation Scheme for Future Wireless Systems," 2019 IEEE Electric Electronics, Computer Science, Biomedical Engineerings' Meeting (EBBT), Istanbul, 2019, pp. 1-4. <https://ieeexplore.ieee.org/document/8742049/>

9) J. M. Hamamreh, H. M. Furqan, and H. Arslan, "Secure pre-coding and post-coding for OFDM systems along with hardware implementation," in Proc. 2017 13th Intern. Wireless Commun. Mob. Comput. Conf. (IWCMC), June 2017, pp. 1338–1343. <http://ieeexplore.ieee.org/document/7986479/>

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7) J. M. Hamamreh, M. Yusuf, T. Baykas, and H. Arslan, "Cross MAC/PHY Layer Security Design Using ARQ with MRC and Adaptive Modulation," in 2016 IEEE Wireless Communications and Networking Conf. (WCNC), April 2016, pp. 1632–1638. <http://ieeexplore.ieee.org/document/7564987/>

6) J. M. Hamamreh and H. Arslan, "Time-frequency characteristics and PAPR reduction of OTDM waveform for 5G and beyond," 2017 10th International Conference on Electrical and Electronics

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5) H. M. Furqan, J. M. Hamamreh, H. Arslan, "Secure Communication via Untrusted Switchable Decode-and-Forward Relay," IEEE International Wireless Communications and Mobile Computing Conference (IWCMC), 1-4, June 26-30, 2017. <http://ieeexplore.ieee.org/document/7986478/>

4) H. M. Furqan, J. M. Hamamreh, H. Arslan, "Secret Key Generation Using Channel Quantization with SVD for Reciprocal MIMO Channels," in 2016 IEEE International Symposium on Wireless Communication Systems (ISWCS), Sep. 2016. <http://ieeexplore.ieee.org/document/7600974/>

3) H. M. Furqan, J. M. Hamamreh, H. Arslan, "Enhancing Physical Layer Security of OFDM-based Systems Using Channel Shortening," IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC), Oct. 8-13, 2017. <https://ieeexplore.ieee.org/document/8292335/>

2) J. M. Hamamreh, H. M. Furqan, Z. Ali and G. A. S. Sidhu, "An Efficient Security Method Based on Exploiting Channel State Information (CSI)," 2017 International Conference on Frontiers of Information Technology (FIT), Islamabad, 2017, pp. 288-293. <https://ieeexplore.ieee.org/document/8261052>

1) J. M. Hamamreh, H. M. Furqan, Z. Ali and G. A. S. Sidhu, "Enhancing the Security Performance of OSTBC Using Pre-Equalization," 2017 International Conference on Frontiers of Information Technology (FIT), Islamabad, 2017, pp. 294-298. <https://ieeexplore.ieee.org/document/8261053>

### Patents

\*) J. M. Hamamreh, H. Arslan, "Automatic repeat-request system for providing absolute security and authentication in wireless networks" H. Arslan, J. M. Hamamreh, 2021.(US Patent - 11,075,710) <https://patents.google.com/patent/US11075710B2>  
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2019209225>

\*) J. M. Hamamreh, H. Arslan, "Secure and adaptive orthogonal division waveforms multiplexing system using channel-based transformation", JM HAMAMREH, H Arslan, 2022. (US Patent - 16/755,019) <https://patents.google.com/patent/US20200351649A1/>  
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2019098973>

\*) H. M. Furqan, J. M. Hamamreh, and H. Arslan, "Adaptive OFDM-IM for Enhancing Physical Layer Security and Spectral Efficiency of Future Wireless Networks," Turkish Patent, 2018.

\*) A. M. Jaradat, J. M. Hamamreh, and H. Arslan, "OFDM with Subcarrier Number Modulation," Turkish Patent, 2018.

\*) A. M. Jaradat, J. M. Hamamreh, and H. Arslan "OFDM with Subcarrier Number and Index Modulation for Enhancing Spectral Efficiency", Turkish Patent, 2018.

\*) H. M. Furqan, J. M. Hamamreh, and H. Arslan, "NOMA Inspired Security Design for Reliable and Secure Communication Systems", Turkish Patent, 2018.

- \* ) A communication system with Multiple-Input Single-Output Nonorthogonal Multiple Access (MISO-NOMA) system and its communication method, WIPO Patent App., 2022.
- \* ) A method for embedding an Artificial Interference Signal into the Transmitted Signal via Multiple Input Multiple Output with Antenna Number Modulation and Adaptive Antenna Selection, WIPO Patent App., 2022.
- \* ) A method for OFDM-based Multi-Cell Transmission using Artificial Signals Injection, WIPO Patent App., 2022.
- \* ) A communication system for Multiuser Down-Link Transmission Method using Auxiliary Signals Superposition for Internet of Things (IoT) devices in Massive Machine Type Communications (MMTC) scenarios 5 and its method, WIPO Patent App., 2022.
- \* ) A method for effective Multi-User Communication Systems in Beyond 5G (B5G) and 6G using Auxiliary Signal Superposition Transmission (MU-AS-ST), WIPO Patent App., 2022.
- \* ) A Multi-User Orthogonal Frequency Division Multiplexing with Subcarrier Number Modulation Method, WIPO Patent App., 2022.
- \* ) A method for doubling the Spectral Efficiency per Area and per Device for Wireless Systems using Multi-Dimensional OFDM Modulated Multi-User Auxiliary Signal Superposition Transmission 5 (D-SEAD), WIPO Patent App., 2022.
- \* ) A Method for Multi-User Multiple Input Multiple Output with Antenna Number Modulation and Adaptive Antenna Selection, WIPO Patent App., 2022.
- \* ) A Method for Non-Coherent Orthogonal Frequency Division Multiplexing with Subcarrier Power Modulation (NC-OFDM-SPM) for Low-Complexity and High Throughput Future Wireless Systems, WIPO Patent App., 2022.
- \* ) Data transmission method using location adjusted, sub carrier number modulation, orthogonal frequency division multiplexing (2020), Patent No: WO2020142044A1 Patent Başvuru Sahipleri : Hüseyin ARSLAN, Jehad M. HAMAMREH, Ahmad M. JARADAT, Patent Buluş Sahipleri : Hüseyin ARSLAN, Jehad M. HAMAMREH, Ahmad M. JARADAT  
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2020142044>
- \* ) Kablosuz Ağlarda Mutlak Güvenlik Ve Kimlik Doğrulaması Sağlaması İçin Otomatik Tekrar Talep Sistemi (2017), Patent No: 2017-GE-561616 Patent Başvuru Sahipleri : JEHAD M. HAMAM-REH, Hüseyin Arslan, Patent Buluş Sahipleri : JEHAD M. HAMAMREH, Hüseyin Arslan
- \* ) Kanal temelli dönüşüm kullanan güvenli ve uyum sağlayan dikgen bölmeli dalga şekilleri çoğullama sistemi (2017), Patent No: 2017-GE-432309 Patent Başvuru Sahipleri: Jehad M. HAMAMREH, Hüseyin Arslan Patent Buluş Sahipleri: Jehad M. HAMAMREH, Hüseyin Arslan
- \* ) Uyarlanabilir modülasyon katsayılı bir dikey frekans bölmeli çoklama yöntemi (2018), Patent

No: 2018-GE-571010 Patent Başvuru Sahipleri: Hüseyin ARSLAN, Haji M. FURQAN, Jihad M. HAMAMREH Patent Buluş Sahipleri: Hüseyin ARSLAN, Haji M. FURQAN, Jihad M. HAMAMREH

\*) Konum ayarlı alt taşıyıcı sayı modülasyonlu bir dikey frekans bölmeli çoklama kullanılan bir veri iletim yöntemi (2018), Patent No: 2018-GE-572428 Patent Başvuru Sahipleri: Hüseyin Arslan, Ahmad M. JARADAT, Jihad M. HAMAMREH Patent Buluş Sahipleri: Hüseyin Arslan, Ahmad M. JARADAT, Jihad M. HAMAMREH

### Supervised Theses

11) SADIQ IQBAL, "New transmission methods for improving the performance of future 6G and beyond networks by utilizing signal superposition and precoding techniques", Master Thesis, Antalya Bilim University, June 2022.

10) SHAHEER KHALID, "Novel comp designs for improving the performance of cell- edge users in future wireless networks", Master Thesis, Antalya Bilim University, June 2022.

9) HAMZA ALI, "Protecting IMSI from fake base stations exploitation and spoofer's impersonations in 5G and beyond cellular networks", Master Thesis, Antalya Bilim University, June 2022.

8) MUHAMMET KIRIK, "Multiple input multiple output with antenna number modulation and its applications", Master Thesis, Antalya Bilim University, 2022.

7) MOHAMMED KHER NOMAN IBRAHIM HIJAZI, "Signal Space Diversity and Convolutional Neural Network Based Equalizer for Improving the Reliability Performance of OFDM with Sub-carrier Power Modulation", Master Thesis, Antalya Bilim University, 10-06-2021.

6) ABDELRAHMAN M.A ABUQAMAR, "STBC and Back Propagation Artificial Neural Network for Improving the Performance of Orthogonal Frequency Division Multiplexing with Subcarrier Power Modulation", Master Thesis, Antalya Bilim University, 10-06-2021.

5) Mohamedou ABEWA, "NOVEL WAVEFORM DESIGNS FOR FUTURE WIRELESS SYSTEMS: NON-COHERENT OFDM WITH SUBCARRIER POWER MODULATION (NC-OFDM-SPM) MULTI-USER AUXILIARY SIGNAL SUPERPOSITION TRANSMISSION (MU-AS-ST)", Master Thesis, Antalya Bilim University, 10-06-2021.

4) Muhammad Furqan Zia, "Novel Advanced Non-Orthogonal Multiple Access Security Scheme for 6G and Beyond Communication Networks", Master Thesis, Antalya Bilim University, 22-01-2021.

3) Joel Poncha Lemayian, "UAV-based Smart Rescue System Utilizing a Novel Wireless Communication Technique With Enhanced Security Against Internal And External Attacks", Master Thesis, Antalya Bilim University, 22-01-2021.

2) H. M. Furqan, "Physical Layer Security Techniques for Future Wireless Communication Systems Against Eavesdropping," PhD Thesis, Istanbul Medipol University, Aug. 2020.

1) A. M. Jaradat, "Advanced modulation options and scheduling techniques for future wireless

communication systems," PhD Thesis, Istanbul Medipol University, Dec. 2022.

### Co-supervised International Students

Below is a list of International Master and PhD Students, from different universities in the world, whom I have mentored remotely (online) besides the other postgraduate students that were directly supervised by me in a face to face manner.

- \* ) Farhan Khan, PhD, New Advanced NOMA, Ireland
- \* ) Believe Nwamae, PhD, Virtual Decentralized MIMO, UK
- \* ) Hussam Alraie, PhD, OFDM-SPM modulation in UWA, Japan
- \* ) Hifa Ahmed, PhD, Modified OTFS-NOMA, IQ
- \* ) Chika Worka, PhD, DL based Smart Communication Systems, Australia
- \* ) Bahache M., PhD, Contactless Wireless Sensing and Body Area Wireless Networks, Algeria
- \* ) Ulku G., PhD, Advanced Waveform Designs for 6G and Beyond - Multiuser OFDM-SPM, TR
- \* ) Nahlah Condict, PhD, OFDM Security Using Randomization and Interference Addition, US
- \* ) Alpha Alimamy Kamara, PhD, OFDM-SPM for integrating sensing and communications, China
- \* ) Volodymyr Marteniuk, Master, Battery-less wireless wearable devices, Ukraine
- \* ) Amal K., Master, OFDM Waveform Security, IQ
- \* ) Iqra Akram, Master, Nonlinear Power amplifier linearization using AI, UK
- \* ) Noriya Maryam, Master, Resource optimization and scheduling with AI based methods, IQ
- \* ) Danyal Khattak, Master, Designing and developing reduced capability (RedCap) 5G devices, Finland
- \* ) Swapnil Dafal, Master, Characteristics of Generalized Frequency Division Multiplexing (C-GFDM), Poland
- \* ) Maedot Ayenew, Master, TV band spectrum measurements using SDR devices, Poland
- \* ) Carlos Eduardo, Master, Novel Energy Harvesting Antenna Design for Battery-less IoT devices, VE
- \* ) Yuvaraj Aravindan, AI applications in 5G Networks, India
- \* ) Tommy Bordain, Building and deploying modern, flexible, scalable and cost-effective 4G networks, US

### Preprints and Technical Reports

- 9) Furqan, Haji M., Jihad Hamamreh, and Huseyin Arslan. "Subcarrier Number and Indices-Based KeyGeneration for Future Wireless Networks." arXiv preprint arXiv:2109.15091 (2021). <https://arxiv.org/pdf/2109.15091.pdf>
- 8) Furqan, Haji M., Jihad Hamamreh, and Huseyin Arslan. "Physical Layer Security for NOMA: Requirements, Merits, Challenges, and Recommendations." arXiv preprint arXiv:1905.05064 (2019). <https://arxiv.org/pdf/1905.05064.pdf>
- 7) Furqan, H. M., Solaija, M. S. J., Hamamreh, J. M., Arslan, H. (2019). Intelligent Physical Layer Security Approach for V2X Communication. arXiv e-prints, arXiv-1905. Intelligent Physical Layer Security Approach for V2X Communication - NASA/ADS (harvard.edu)
- 6) A. M. Jaradat, J. M. Hamamreh and H. Arslan, "OFDM With Hybrid Number and Index Modulation," arXiv preprint arXiv:1911.03747 (2019). <https://arxiv.org/pdf/1911.03747.pdf>
- 5) J. M. Hamamreh, "A Novel Transceiver Architecture for Making Polar Codes Work Over Multipath Fading Channels as They Do Over AWGN Channels," 2019. <https://dapp.orvium.io/api/deposits/5d43f9e147192a74dd9ee5e3/files/5d442659e0c2ea6e0cafaa42>
- 4) J. M. Hamamreh, "Physical Layer Security Against Eavesdropping in the Internet of Drone Communication Systems: An Overview," 2019. <https://dapp.orvium.io/api/deposits/5d4429c4e0c2ea6e0cafaa47/files/5d442b2ab8dc4e753211fe8e>
- 3) J. M. Hamamreh, "OFDM-Subcarrier Index Selection with Artificially Interfering Signals for Improving the Physical Layer Security of IoT-5G Systems," 2019. <https://dapp.orvium.io/api/deposits/5d452af20357f060f3d36cdb/files/5d4536cb6a2dc5914d128efa>
- 2) Jihad Hamamra, Hassan El-sallabi, Mohamed Abdallah, Khalid Qaraqe, "Covering the Whole LTE Spectrum (400-3500) MHz by Employing One Reconfigurable Inverted F-Antenna", available on research gate website.
- 1) J. M. Hamamra, N. Menawi, A. Natshi, K. Hijeh, A. Mousa, F. Hasan, Y. Dama; "Self-Organizing Schedulers in LTE System for Optimized Pixel Throughput Using Neural Network", available on Researchgate.

### Posters

- \* ) Jihad Hamamra, Hassan El-sallabi, Mohamed Abdallah, Khalid Qaraqe, "Advance in Adaptive Modulation for Fading Channels, in Qatar Foundation Annual Research Conference 2013. <http://www.qscience.com/doi/abs/10.5339/qfarf.2013.ICTP-012>
- \* ) J. M. Hamamreh, H. Arslan, "Secure Waveform Design for 5G and Beyond", Poster on 6G Communications Technologies and Applications Workshop at Istanbul Medipol University, Aug. 2017. <http://cosinc.medipol.edu.tr/workshop/>

## Funded Research Projects as PI

\*) TUBITAK 3501, 119E392, "Novel Advanced Non-Orthogonal Multiple Access Schemes For Enhancing Communication Security And Reliability Of Future Low-Complexity, Massive Machine Type Communications", 2019-2021.

\*) TUBITAK 1002, 119E408, "Non-Coherent OFDM-Subcarrier Power Modulation For Low Complexity and High Throughput IoT Applications", 2020-2021.

## Research Projects I worked on as Researcher

Tubitak/ 2014-2017 Physical Layer Security for Wireless Systems: Designing and developing new physical security methods.

İSTKA/ 2014-2015 Communication in Disastrous situations: Devising power efficient waveforms dedicated for communication in critical environments.

SSM/ 2018-present Cross Layer Communications Security for Cognitive Radio Networks. Devising effective ARQ-based security techniques for centralized (cellular) and decentralized (Ad-hoc) wireless systems.

## Research Proposals I Participated in as Collaborator

- 1- Mobile Network Security and Protocols for IoT and Cellular Communications: PHY, MAC, and Network layers, TUBITAK-QNRF Joint Funding Program (Academia-Industry Co.)
- 2- Cross Layer Communications Security For Centralized (Cellular) And Decentralized (Ad Hoc) Wireless Networks, SSM (Defense Industry Undersecretaries of Turkey)
- 3- Joint PHY/MAC Layer Security Algorithms for Securing the Internet of Things Against Eavesdropping, Florida Center for Cyber Security, USA.
- 4- Physical layer security with lens antenna structure, NSF, USA.
- 5- Secure and reliable cyber-physical radio network "SePhyre", with University of Surrey and Trinity College London, CHIST-ERA, Europe.
- 6- Flying backhaul mesh network using low altitude platform (LAPs), joint Portuguese-Turkish project proposal.

## Awards

- 1- Received the top researcher award of ABU three times: 2018, 2021, 2022.
- 2- Attended in the list of top 10000 researchers prepared by the international ranking organization AD Scientific Index-2023.
- 3- Ranked number 9 among all the academicians of ABU in research.
- 4- My innovative patented works won several medals in international invention contests and fairs.
- 5- Won the Tubitak career research project in 2019.
- 6- Named the top performing and most productive PhD graduate in 2018.
- 7- Received a monetary prize from ULAKBİM for publishing in the most prestigious journal in the field of Telecommunication and computer engineering with impact factor or more than 30, IEEE



Communications Surveys And Tutorials.

## Professional Activities

Associate Editor at RS Open Journal on Innovative Communication Technologies.

Area Editor at Balkan Journal of Electrical and Computer Engineering.

Review Editor at Frontiers in Communications and Networks.

Seasonal consultant for many wireless telecom companies.

Mentor for many professionals and researchers overseas.

Referee panelist for many funding agencies including Tubitak and COST.

Researcher at European Cooperation in Science and Technology, e-COST. An early member of the massive Telcom Infra Project (TIP) by Facebook.

Board member at Researcherstore.com

IEEE Transactions on Information Forensics and Security, reviewer

IEEE Transactions on Wireless Communications, reviewer

IEEE Transactions on Communications, reviewer

IEEE Transactions on Vehicular Technology, reviewer

IEEE Transactions on Signal Processing, reviewer

IEEE Transactions on Industrial Informatics, reviewer

IEEE Communications Surveys and Tutorials, reviewer

IEEE Communications Letter, reviewer

IEEE Wireless Communications Letter, reviewer

IEEE Sensors Journal, reviewer

IEEE Access, reviewer

IEEE Wireless Communications Magazine, reviewer

IEEE Internet of Things Journal, reviewer

Physical Communications (PHYCOM) by Elsevier, reviewer

Ad Hoc Networks by Elsevier, and Sensors by MDPI reviewer

Wiley, Transaction on emerging telecommunication technologies, reviewer

International Journal of Communication Systems (IJCS) by Wiley, reviewer

Turkish Journal of Electrical Engineering and Computer Sciences, reviewer

Book series by EAI/Springer, Innovations in Communications and Computing, reviewer

Book series by the Institution of Engineering and Technology (IET), reviewer

Many more other journals that could not all be counted here

## Professional Training Certificates

1 - Cisco Certified Network Associate (CCNA 1, 2, 3, 4) Certificate from CISCO company.

2 - IT Essential Certificate from CISCO company.

3 - Computer Simulation Technology (CST) Certificate: (3D EM Simulation and Design Software) from CST company.

## Selected Training Courses I Have Offered

All Training Can be Accessed Online from Here

- 1) Python For Wireless Digital Communications
- 2) How to Practically Build and Deploy Private 5G Networks
- 3) Open RAN and Private 5G Networks
- 4) Software Defined Radio (SDR) & Wireless Lab.

- 5) Wireless Security: From Cryptography to PHY Layer Security
- 6) Advanced Radio Access Network (RAN) Technologies – 5G and 6G
- 7) Wireless Communications: From Theory to Practice
- 8) Computer Networks and OSI Layers: From App to MAC and PHY
- 9) Digital Communication: From Beginner to Expert
- 10) Communication System Principles and its IoT Applications
- 11) Orthogonal Frequency Division Multiplexing (OFDM)