
INTERNATIONAL
IF-FTT 2023
FORUM
CHO8903 IEEE EGYPT
AP-S/MTT-S Joint Chapter
International Forum on Future Telecommunications and Technologies (IF-FTT'2023)
December 17 – 18, 2023, Free Webinar, Egypt
IEEE
MTT-S
IEEE EGYPT
AP-S/MTT-S Joint Chapter

Yasser M. Madany

Founder and Chair of the IEEE Egypt AP-S/MTT-S Joint Chapter

17.12.2023 | 5:50-6:00 pm CLT (GMT+2)

Opening Speech and IF-FTT'2023 Forum Program

YI HUANG

Professor at Electrical Engineering and Electronics, The University of Liverpool, Liverpool, UK

17.12.2023 | 6:00-6:30 pm CLT (GMT+2)

Liquid Materials and RF / Microwave Antennas

ADAM NARBUDOWICZ

Senior Research Fellow at Trinity College Dublin and an Associate Professor at Wroclaw University of Science and Technology in Wroclaw, Poland

17.12.2023 | 6:30-7:00 pm CLT (GMT+2)

Securing IoT: Antennas as Padlocks, Propagation as a Key

MOHAMMED ELAMASSİE

Assistant Professor (EE), Communication Systems at Özyeğin University, Istanbul, Turkey

17.12.2023 | 7:00-7:30 pm CLT (GMT+2)

Exploring the Potential of Multi-Layered Airborne Networks for Optical Backhaul

AHMED RADY

Founder, President, and CEO of Open Valley, Egypt

17.12.2023 | 7:30-8:00 pm CLT (GMT+2)

Open Networks and the Future of Connectivity

HATEM KHATER

Associate Professor of Computer and Systems Engineering, AI and Vice Dean of Faculty of Engineering, Hours University, Egypt

17.12.2023 | 8:00-8:30 pm CLT (GMT+2)

Improving the Performance of The Artificial Intelligence-Based Autonomous Surface Navigation System

December 17, 2023 | Free Webinar Link:

MOHAMED-SLIM ALOUINI

Distinguished Professor, Electrical and Computer Engineering, Wireless CT Lab, King Abdullah University of Science and Technology (KAUST), KSA

18.12.2023 | 6:00-6:30 pm CLT (GMT+2)

Towards Extreme Band Communications to Super-Connect the Connected and to Connect the Unconnected

QAMMER ABBASI

Professor of Applied Electromagnetics and Sensing (Electronic & Nanoscale Engineering), James Watt School of Engineering, University of Glasgow, UK

18.12.2023 | 6:30-7:00 pm CLT (GMT+2)

6G and Its Enabling Technologies

KHALED NAGUIB

General Manager (GM) and Co-founder at Digital Hub Company, Egypt

18.12.2023 | 7:00-7:30 pm CLT (GMT+2)

New ERA in AI and Its Effect on Digital Transformation

SHERIF M. ABUELENIN

Professor of Communications Engineering, Head of the Department of Electrical Engineering, Faculty of Engineering, Port-Said University, Egypt

18.12.2023 | 7:30-8:00 pm CLT (GMT+2)

On The Connectivity Analysis of Wireless Ad-Hoc Networks

IBRAHIM KAMEL IBRAHIM

Technical Country Manager, My Communication Company, Egypt

18.12.2023 | 8:00-8:30 pm CLT (GMT+2)

Propagation and Scattering in In-Building Solutions (IBS)

ABDELRHMAN ESLAM HASAN

CEO, Under Control Company, Egypt

18.12.2023 | 8:30-9:00 pm CLT (GMT+2)

Inside the Embedded World: A Webinar for Aspiring Engineers

December 18, 2023 | Free Webinar Link:

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Keynote Speakers

Liquid Materials and RF / Microwave Antennas

YI HUANG
Professor at Electrical Engineering and Electronics, The University of Liverpool, Liverpool, UK

IEEE Antennas and Propagation Society

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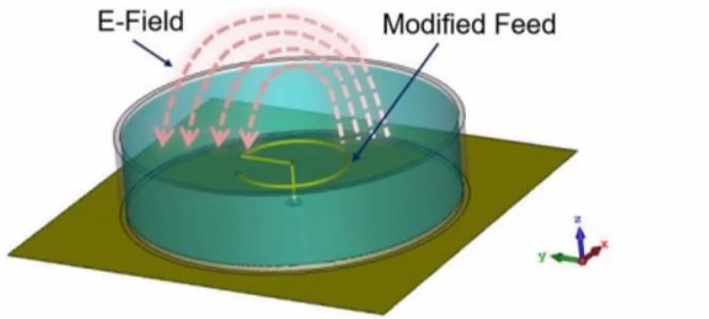
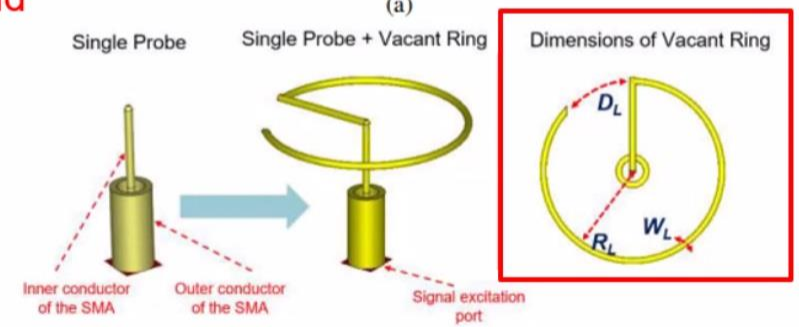
A new feeding scheme

Note:

Traditional DRAs using the solid material resonators **cannot** easily accommodate such feeding structures (due to fabrication complexity and high cost).

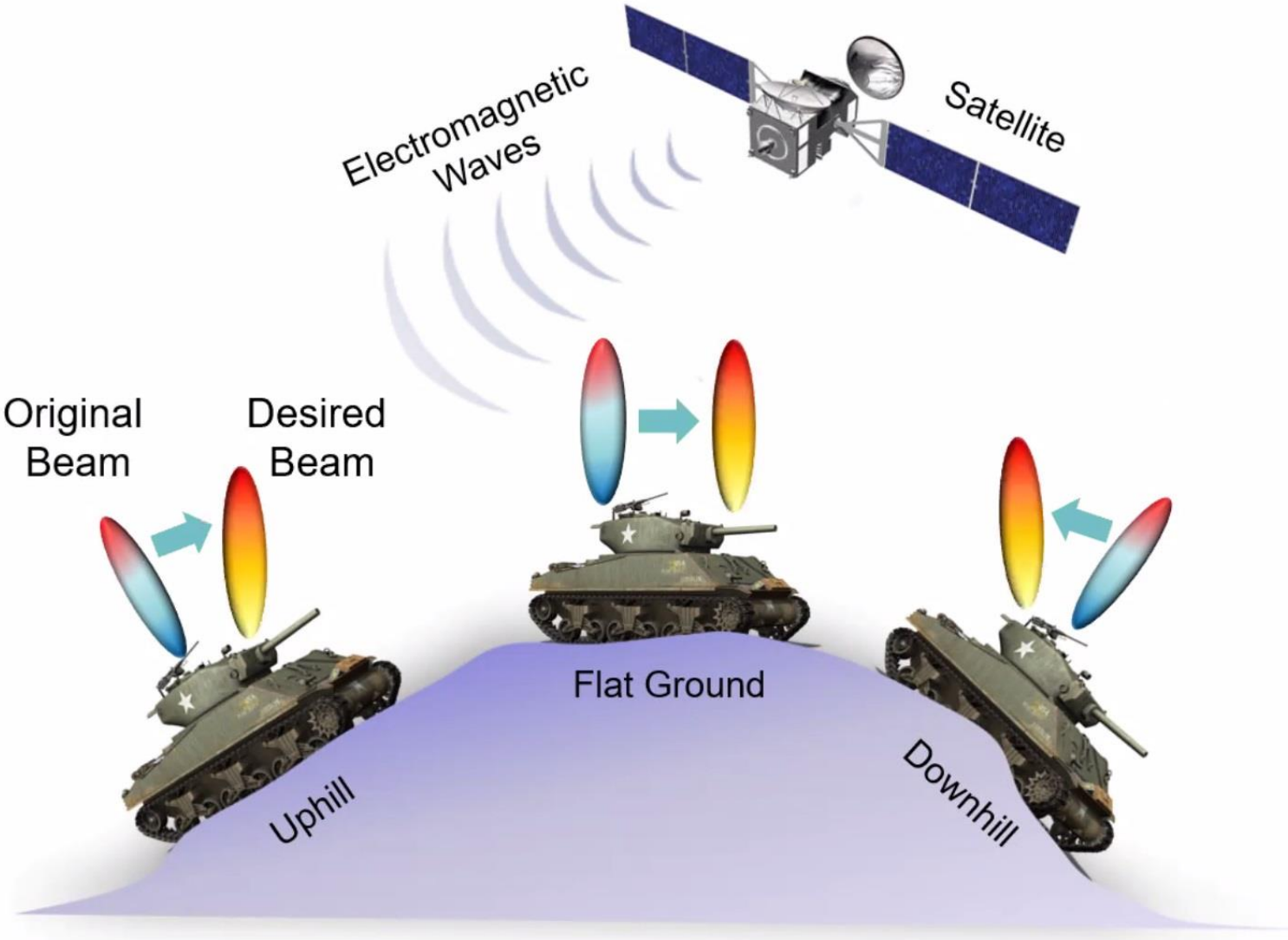


(a)



(b)

Polarisation is changed to **Circular Polarisation (CP)**



Real world applications?

Participants (27)
Find a participant
AA Ayman Almahallawy (Me)
YM Yasser Madany (Host)
YH Yi Huang
AN Adam Narbudowicz
AA Ahmed Alieldin
AE ahmed elsherbini
AK Ahmed Kamal
AR Ahmed Rady
A Amal Soliman
BO Basmala Osama
Dr Hatem Khater
D Dr.amna.said
Dr/Naglaa Fayez Elgzar
EM Eng. Mostafa Salah
HA Hassan Abou Seada
Mahmoud Ahmed Shawky Ahmed
MM Mai Mostafa
MH Mariam Hossam
Mohamad Nooh
M Mohammed Elamassie
R Ramy
RM Ramy Mohamed
Roshdy Abdelrassoul
Safa El Askary
SS sagy shawky

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Compact 3-port and 5-port antennas

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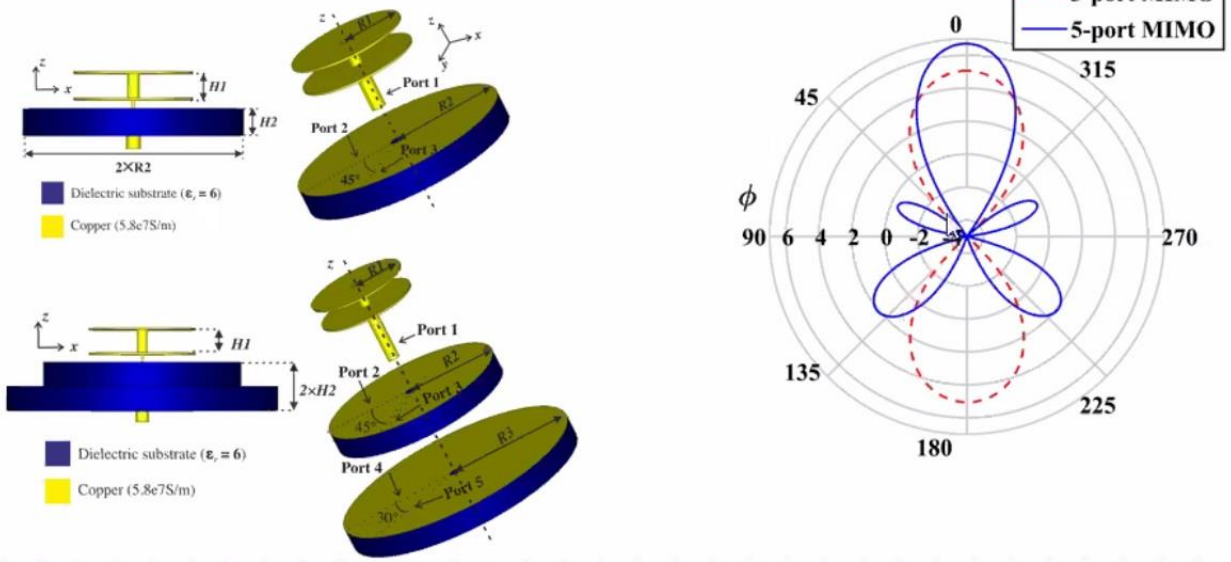

A Zandamela, A Chiumento,
N Marchetti, A Narbudowicz
"Angle of Arrival Estimation
Via Small IoT Devices:
Miniaturized Arrays vs MIMO Antennas"
IEEE Internet of Things Magazine, June 2022

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Find a participant

- Ayman Almahallawy (Me)
- Yasser Madany (Host)
- Adam Narbudowicz
- ahmed elsherbini
- Ahmed Rady
- Amal Soliman
- Amr Mohamed
- Azremi Abdullah Al-Hadi
- Dr Hatem Khater
- Dr. Ahmed Hanae Kassem
- Dr.amna.said
- Dr/Naglaa Fayez Elgzar
- Eng. Mostafa Salah
- eslam tawfek
- G6 Mohamed Gamal Elberawy
- Hassan Abou Seada
- Jawad Ali
- Mahmoud Ahmed Shawky Ahm...
- Mai Mostafa
- Mariam Hossam
- Mohamad Nooh
- Mohammed Elamassie
- MR-MA
- Ramy Mohamed
- Roshdy Abdelrassoul

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Smart Watch Implementation

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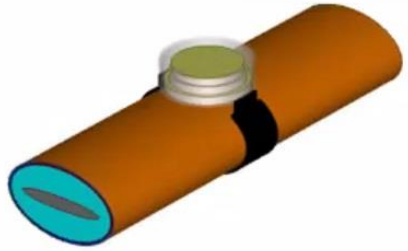
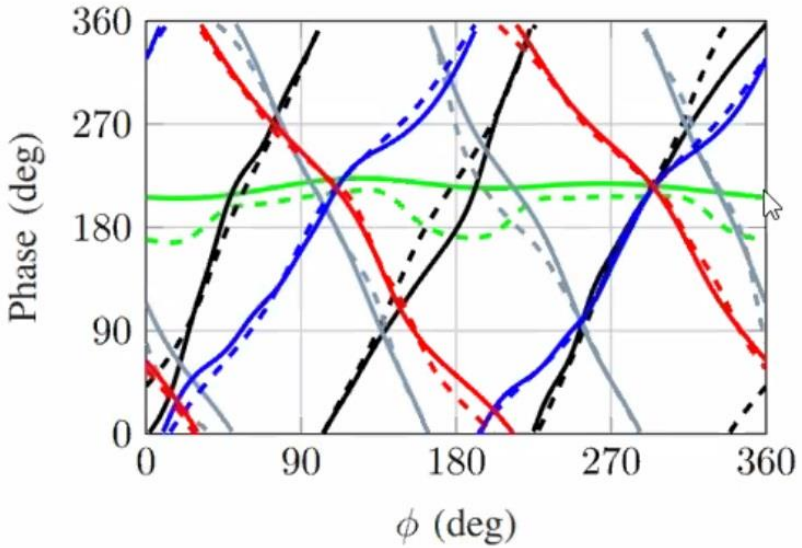
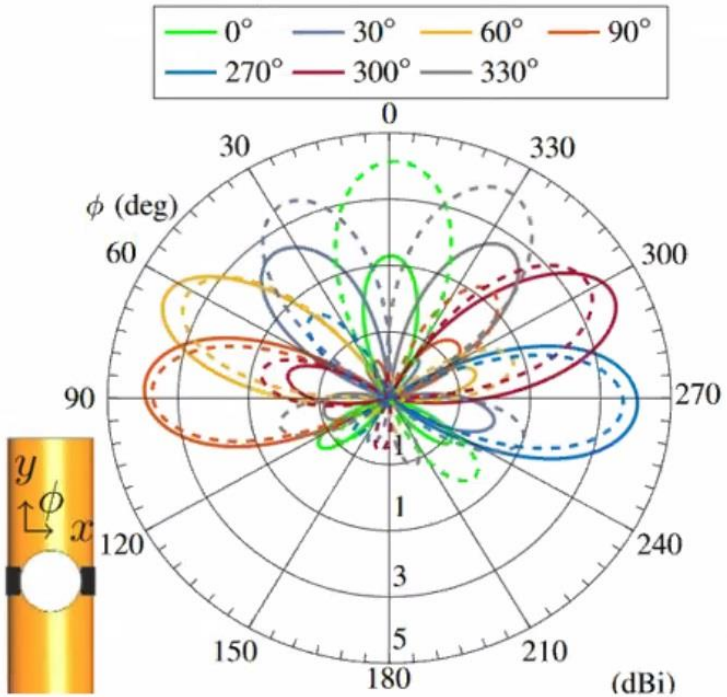


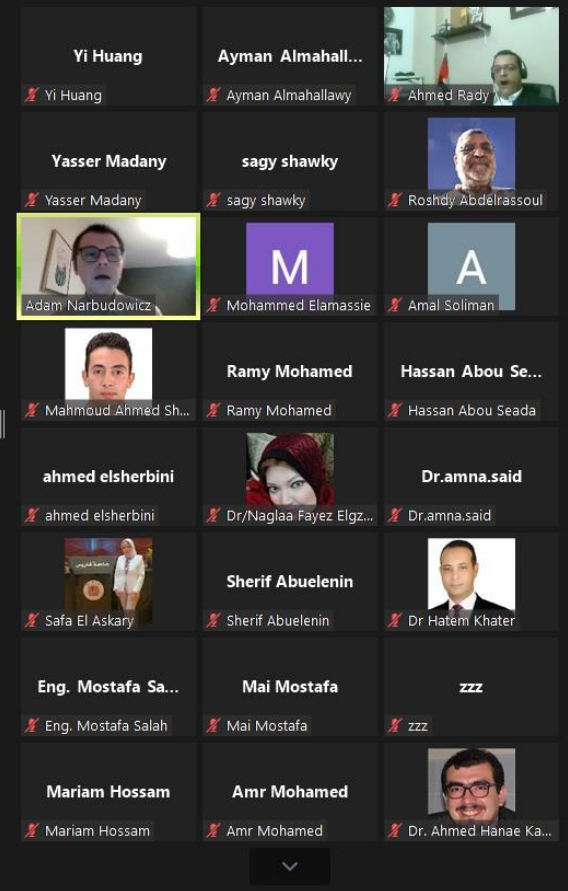


Generated beams (Realized gain):



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

A. Zandamela, N. Marchetti and A. Narbudowicz, "Directional Modulation from a Wrist-Wearable Compact Antenna", EuCAP 2022



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Exploring the Potential of Multi-Layered Airborne Networks for Optical Backhaul

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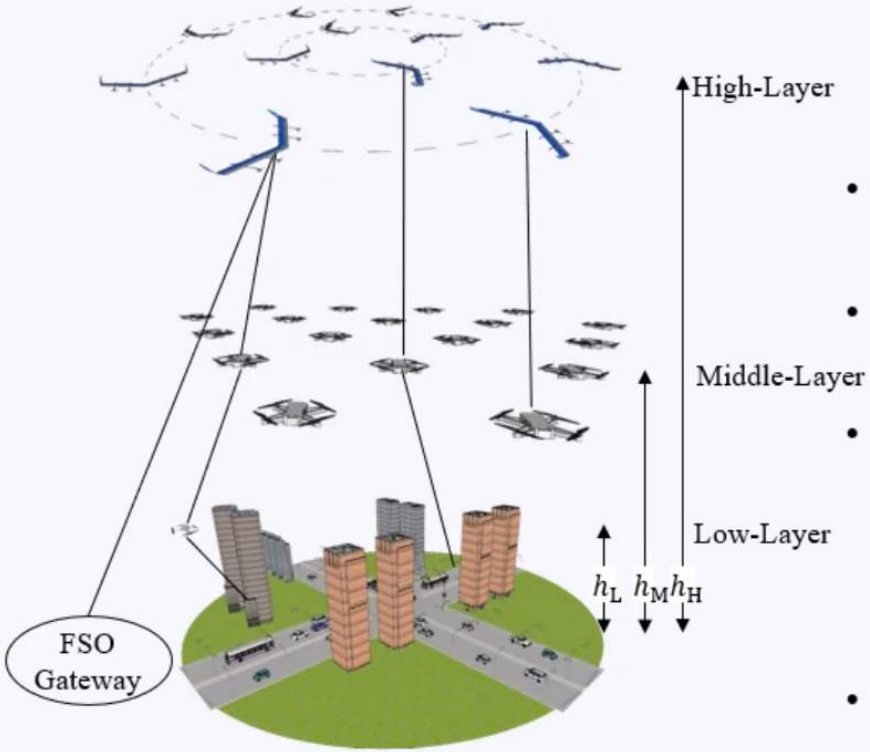
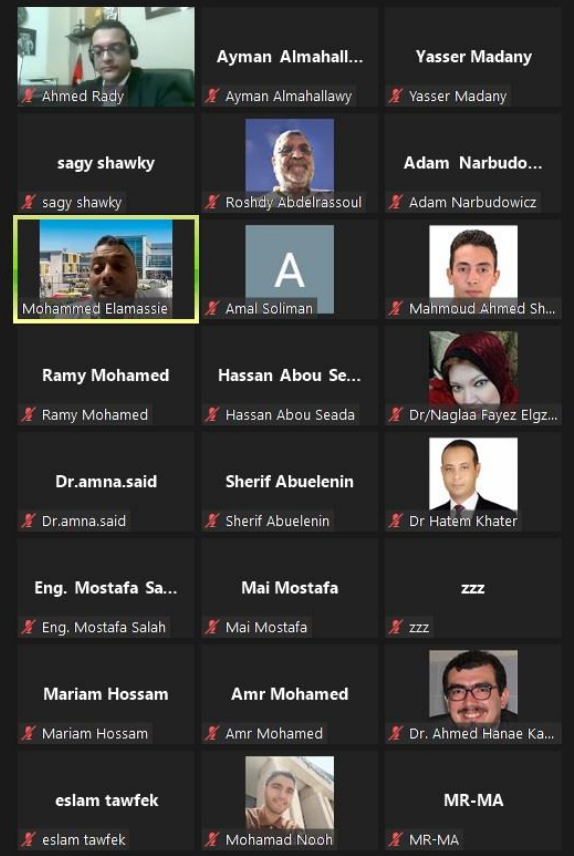
FSO-Based Airborne Backhaul Network

- To satisfy the backhaul requirements of ground base stations for a given geographical location, we need to answer the following fundamental questions:



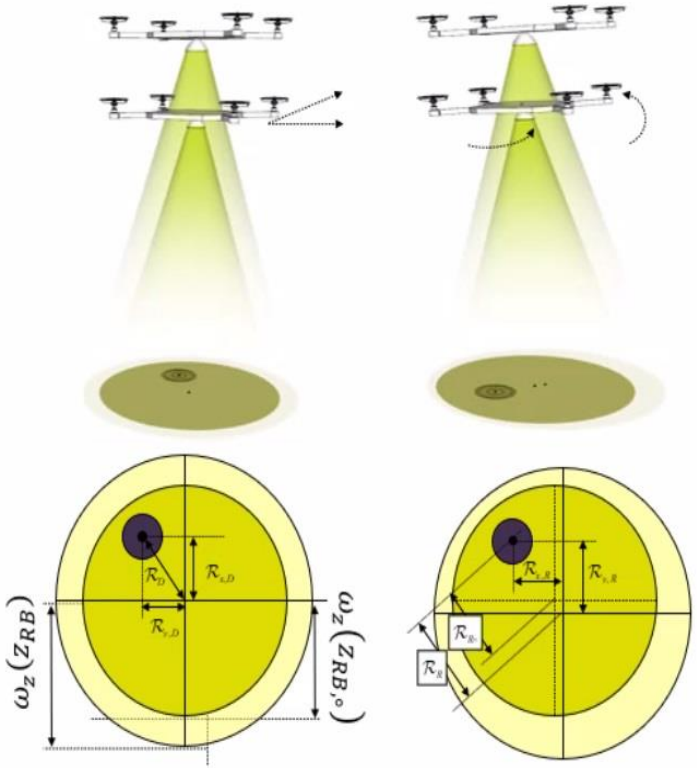
- How **many layers** should be utilized in the airborne setup? Is a single layer sufficient, or should we opt for multiple layers?
- What is the optimal **number of HAPS tracks** needed?
- How many **HAPS units** should be deployed **within each track**?
- In scenarios involving multiple layers, what is the recommended **number of rotary-wing UAVs** to deploy in the **middle-altitude** and **low-altitude** layers within a specific area?
- What is the **number of laser sources** required **per airborne node**?

M. Elamassie and M. Uysal, "FSO-Based Multi-Layer Airborne Backhaul Networks", under review



UAV-Based Link

- A rotary-wing UAV maintains a semi-stable hover while being influenced by **two types of motion**.
- It can be laterally displaced by a specific amount, and the UAV also undergoes rotations along its axes, including rolling, yawing, and pitching.
- Shifting the UAV horizontally will similarly shift the beam's axis, regardless of vertical distance. On the other hand, displacements due to rotation vary with transmission distance.



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AHMED RADY
Founder, President, and CEO of Open Valley, Egypt

Demonstrative and Industrial Speakers

Open Networks and the Future of Connectivity

IEEE Antennas and Propagation Society

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KEY HIGHLIGHTS

Open Valley is The Region's First Open RAN Global Partner...

TELECOM INFRA PROJECT

Open RAN Project Group & Open Core Project Group

Global Open Source and cloud native platform. r/x Apps SD-RAN

ONF

O-RAN ALLIANCE

Offical member and contributor of the O-RAN Alliance WG1,4, for ORAN standard and Specifications

THE REGION'S FIRST & ONLY OFFICIAL MEMBER AND ACTIVE CONTRIBUTOR IN ALL LEADING GLOBAL OPEN NETWORKS ORGANIZATIONS AND STANDARDIZATION BODIES

Building the foundation for the 6G and NextG as part of the NextG alliance group

atis

&

3GPP A GLOBAL INITIATIVE

OpenValley Transforming Networks

INDUSTRY OVERVIEW

Open RAN Key Drivers...

Key Benefits of Open RAN Adoption

Supply Chain Robustness

The Open RAN ecosystem mitigates supply chain risks and promotes supplier diversity

Cost Savings

Benefit from the economies of scale associated with the Open RAN ecosystem

Mix-and-Match Deployment Option

Enables choosing the best-of-breed option while avoiding supplier lock-in

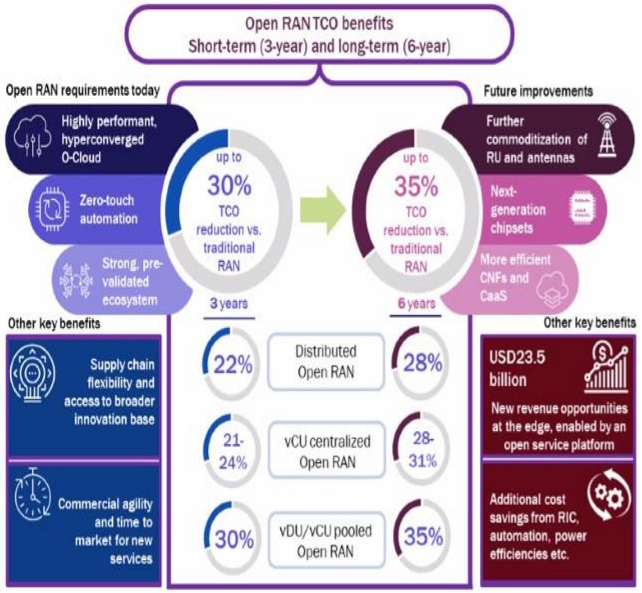
Programmability

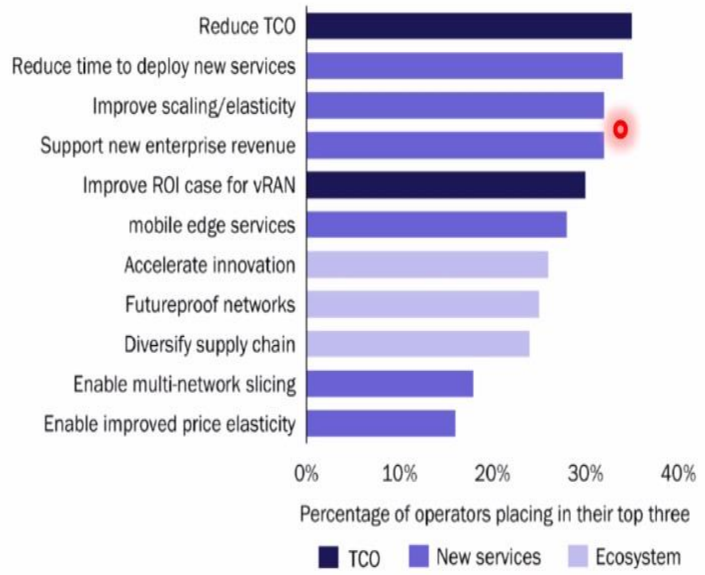
Open RAN is soft-driven, which reduces feature and service time-to-market delivery

Openness

Open Standard, implementation to avoid proprietary HW and Vendor lock in

Top Drivers for Open Ran Deployment





OpenValley
Transforming Networks

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Demonstrative and Industrial Speakers

Improving the Performance of The Artificial Intelligence-Based Autonomous Surface Navigation System

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Introduction

Unmanned Vehicle (UV)

any vehicle that operates without a human occupant.

1- Unmanned Ground Vehicle (UGV)

Vehicle that operates on the ground

2- Unmanned Surface Vehicle (USV)

Vehicle that operates on the water surface controlled by a remote human operator

3- Autonomous Surface Vehicles (ASVs)

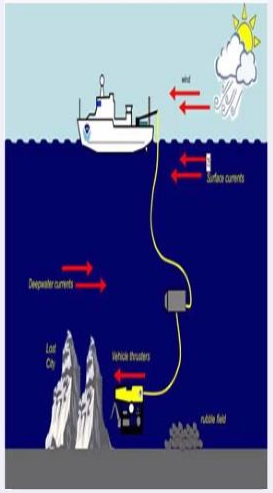
Vehicle that operates independently of direct human input.

4- Unmanned Underwater Vehicle (UUV).

Vehicle that operates underwater surface

Remote Operated Vehicles (ROVs)

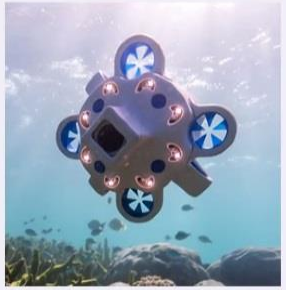
any vehicle that controlled by a remote human operator



Autonomous Underwater Vehicles

(AUVs)

any vehicle that operate independently of direct human input.



Dr Hatem's network bandwidth is low

Participants (23)

Find a participant

- Ayman Almahallawy (Me)
- Yasser Madany (Host)
- Dr Hatem
- Abdullah Madni
- Ahmed Abdalah
- Amal Soliman
- Dr Hatem Khater
- Dr wageda
- Dr/Naglaa Fayez Elgzar
- eslam tawfek
- gouda
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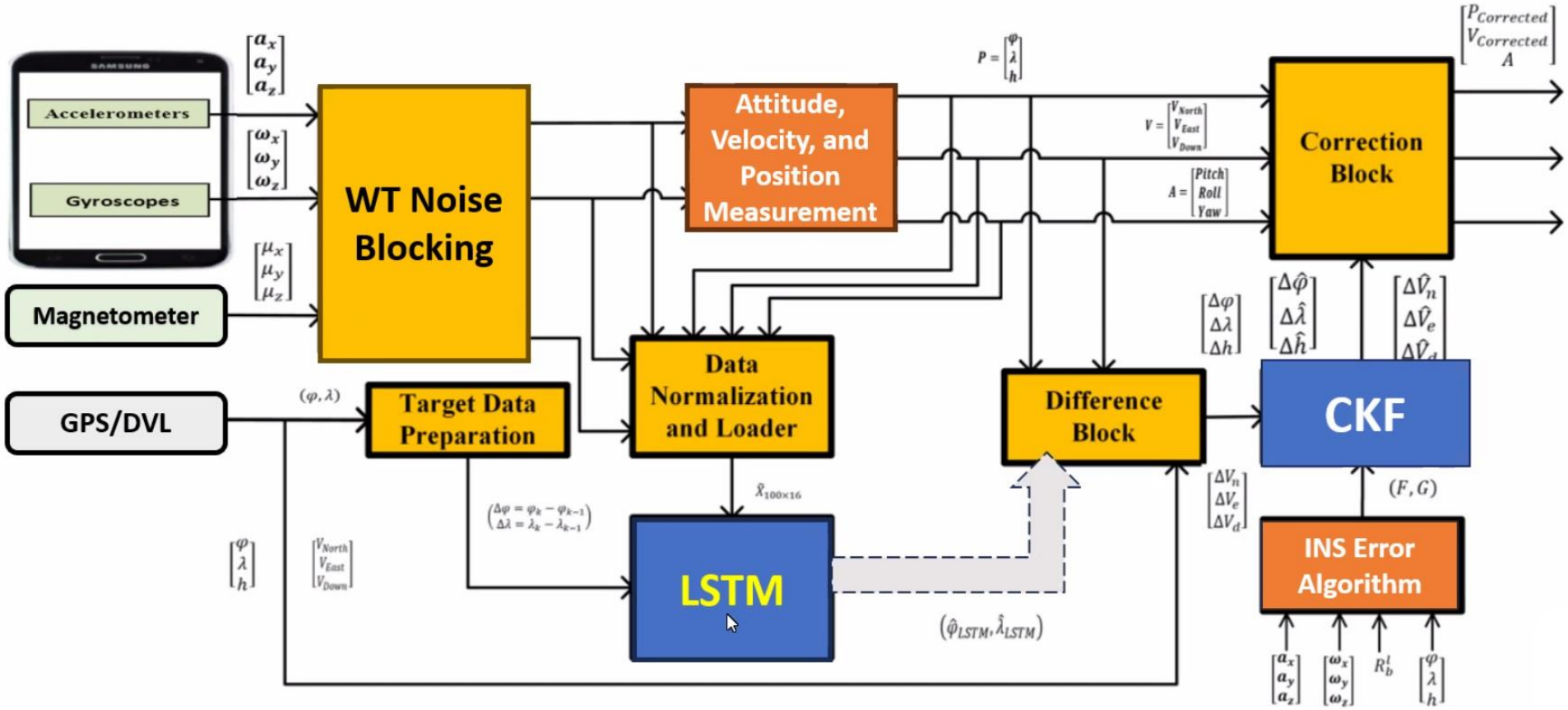
- Roshdy Abdelrassoul
- sagy shawky
- Satish Kumar
- sherif abuelenin - egypt
- Somaya A. Mohamed
- Taha
- Dr. Hussam Elbehiery

The Platform's Overall Structure



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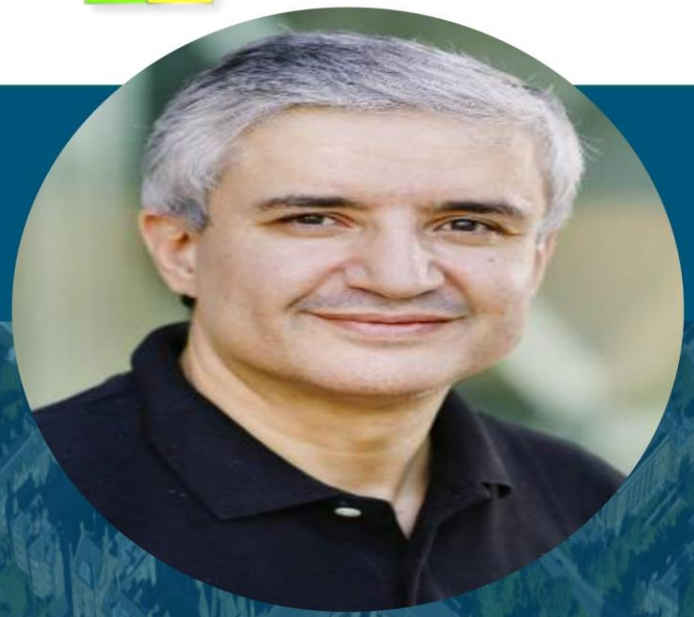

Keynote Speakers

Towards Extreme Band Communications to Super-Connect the Connected and to Connect the Unconnected

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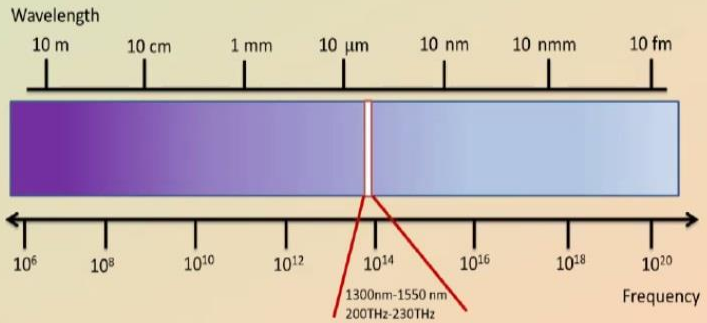
Free Space Optical (FSO) Communication

Narrow beam connects two optical wireless transceivers in LOS.



Applications

- Initially used for secure military and in space
- Last mile solution
- Optical fiber back-up
- High data rate temporary links
- Wireless Fronthaul/Backhaul in celluar network

Benefits

- Unlicensed and unbounded spectrum
- Cost-effective
- Narrow beam-widths (Energy efficient, immune to interference and secure)
- Behind windows
- Fast turn-around time suitable for brown-field

Challenges

- Additive noise and background radiation
- Atmospheric path loss and attenuation
- Atmospheric Turbulences
- Alignment and tracking

[1] M. Esmail, A. Raghed, H. Fathallah, and M. -S. Alouini, "Investigation and demonstration of high speed full-optical hybrid FSO/fiber communication system under light and storm condition", IEEE Photonics Journal, Vol. 9, No. 1, February 2017.
[2] M. -A. Lahmeri, M. Kishk, and M. -S. Alouini, "Stochastic geometry-based analysis of airborne base stations with Laser-powered UAVs," IEEE Communication Letters, Vol. 24, No. 1, pp. 173-177, January 2020.
[3] A. Trichili, M. Cox, B. S. Ooi, and M.-S. Alouini, , ''Roadmap to free space optics,' Journal of Optical Society of America B, 2020

Hybrid THz/FSO System Model

- A backhaul hybrid FSO/THz link
- between two buildings of 50-100 m altitude, situated 100 m apart.
- Both the hard and soft switching based operations are performed for the hybrid FSO/THz link.
- N_r antennas at the THz receiver are considered for improved THz link performance, operating at 118 GHz frequency.
- N_t transmit antennas are considered at the RF transmitter to improve the mmWave RF link performance, operating at 28 GHz frequency.
- Due to size limit constraint, only single antenna is considered at the MUs.

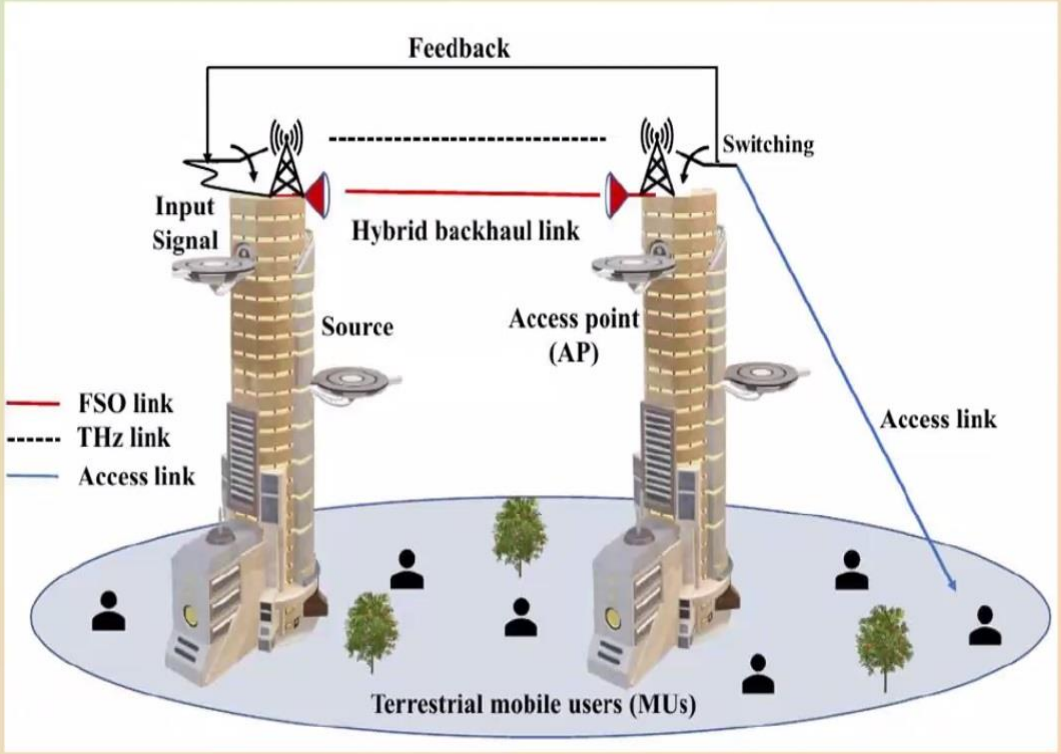


Fig. 4: Considered switching based system model.

P. Singya, B. Makki, A. D'Errico, and M. –S. Alouini, "Hybrid FSO/THz based Backhaul Network for Multiuser-Multiantenna Terrestrial Communication", IEEE Transactions on Wireless Communications, 2023.

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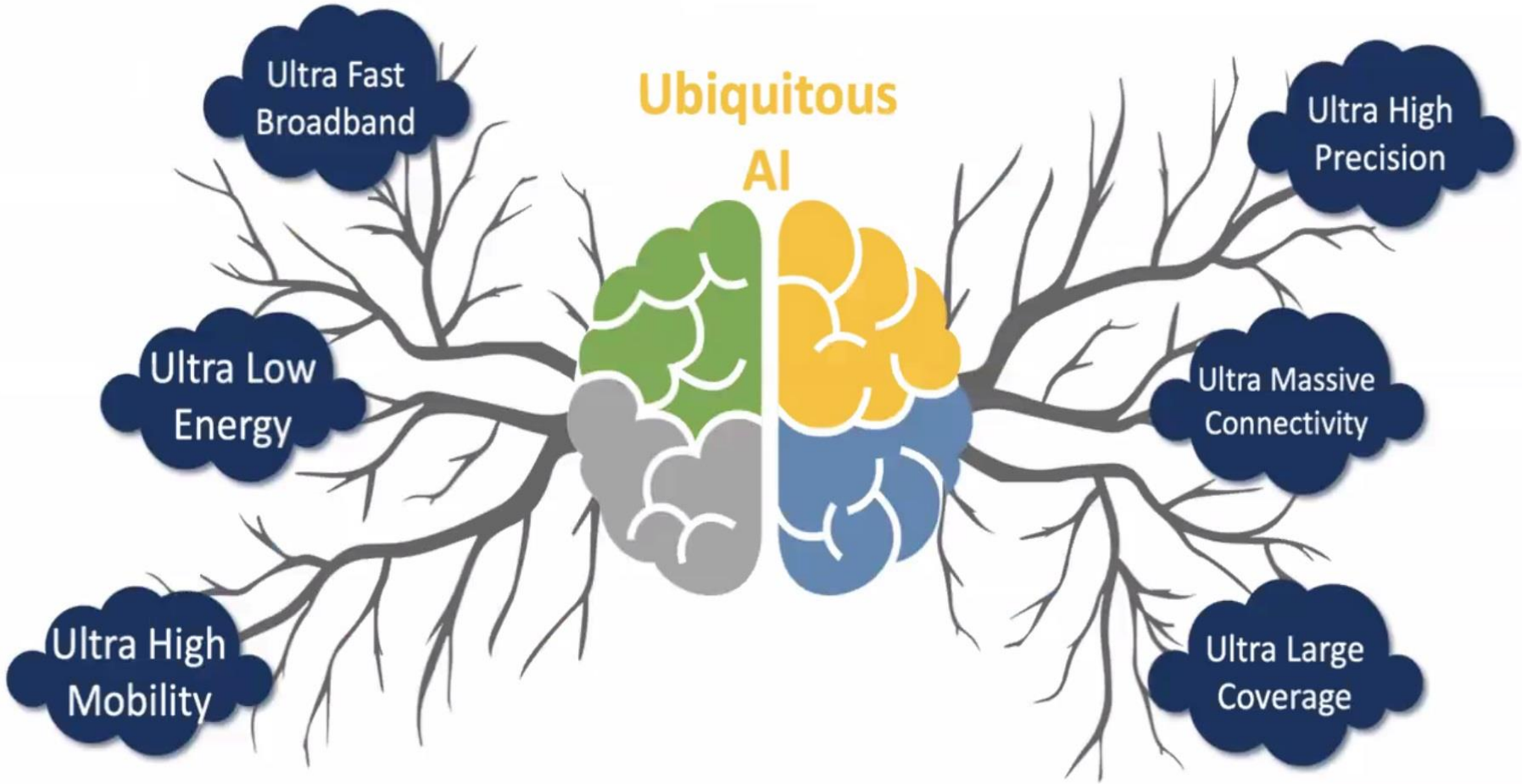
Elements of 6G

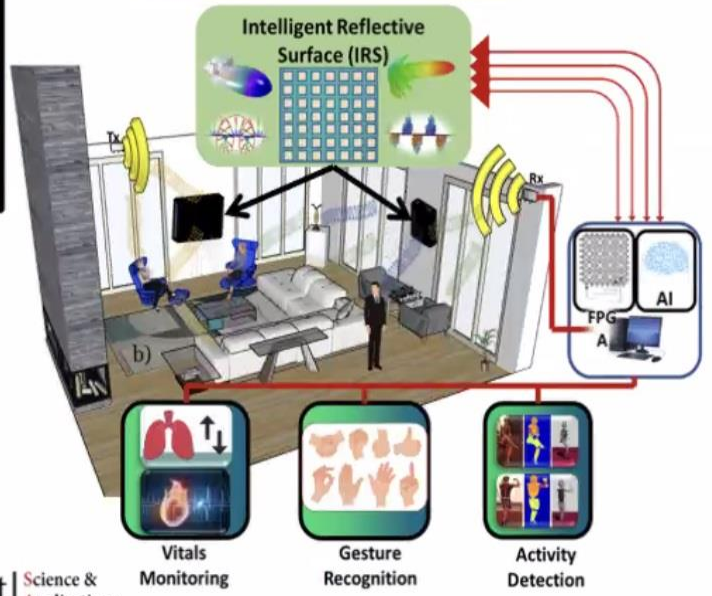


Wireless on the Walls (WoW)

University of Glasgow

CSI Communication Sensing & Imaging

CONTACTLESS SENSING



Vitals Monitoring | Gesture Recognition | Activity Detection

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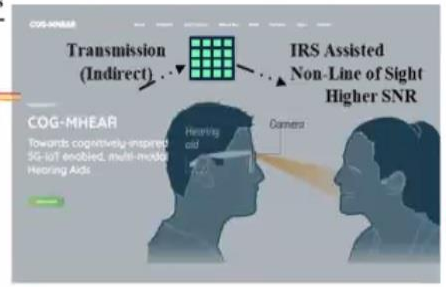

SCIENTIFIC REPORTS

nature

eLight

Nanoscale

WORLD CHANGING GLASGOW

DEVICES

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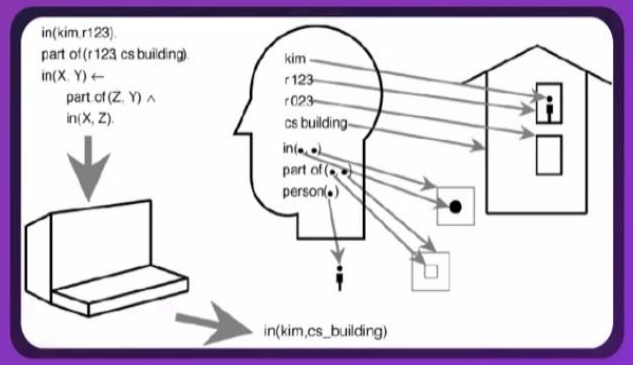
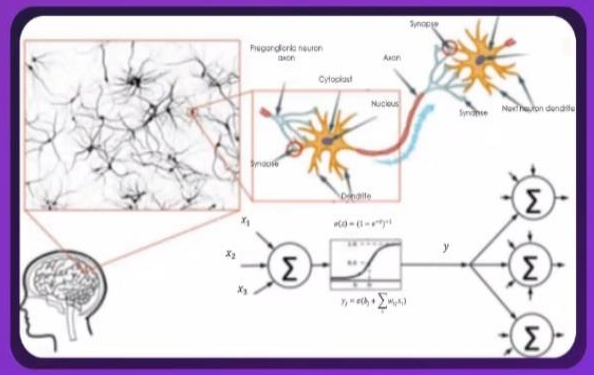
Artifical Intellligence Working Technique

Symbolicism
الترميز



Connectionism
الاتصال



Actionism
اخذ القرار

Ayman Almahall...
Ayman Almahallawy

Yasser Madany
Yasser Madany

Ramy Mohamed
Ramy Mohamed

Hassan Abou Se...
Hassan Abou Seada

R
rehab mahmoud

Khaled Ibrahim
Khaled Ibrahim

Alaa hassan
Alaa hassan

e
eslam tawfek

Sherif Abuelenin
Sherif Abuelenin

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Amal Soliman


Adegboye Olaoluwa

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Self-driving shuttles:

Autonomous shuttles are a flexible solution to move people at sub-50km/h speeds along predetermined, learned paths like industrial campuses, city centers, or suburban neighborhoods. Self-driving shuttle trial deployments are expected to accelerate quickly

Monitoring social media to identify incidents:

Traffic congestions are an issue for citizens and governments alike. Congestions happen mostly due to accidents on roads, and it negatively impacts travel times, fuel consumption, and carbon emissions. Artificial intelligence can be used to monitor social media to identify tweets about recent accidents.

INTERNATIONAL IF-FTT 2023 FORUM

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Demonstrative and Industrial Speakers

On The Connectivity Analysis of Wireless Ad-Hoc Networks

SHERIF M. ABUELENIN
Professor of Communications Engineering, Head of the Department of Electrical Engineering, Faculty of Engineering, Port-Said University, Egypt

IEEE Antennas and Propagation Society

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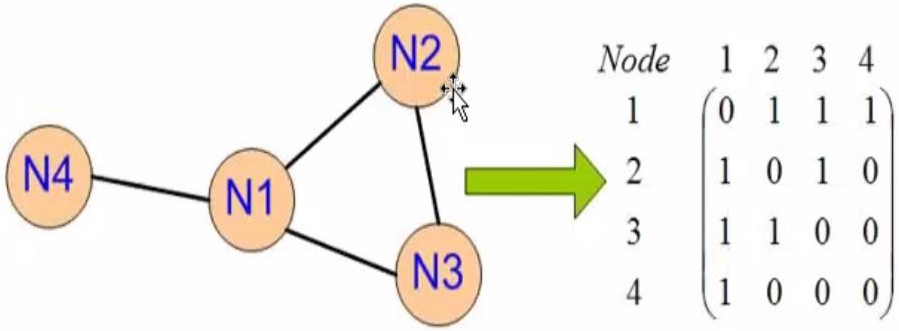
ADJACENCY AND LAPLACIAN MATRICES IN NETWORK ANALYSIS

- The simplest case of an adjacency matrix is that of an un-weighted undirected network.
- The adjacency matrix is symmetric matrix whose elements are either 0 or 1, where 1 represents a link between two nodes, and 0 represents no link.
- Whole information about a network is encoded in its adjacency matrix **A** (as well as the Laplacian matrix **L = D - A**).
- Zero second smallest eigenvalue (algebraic connectivity) of **L** means the network is disconnected.



Node	1	2	3	4
1	0	1	1	1
2	1	0	1	0
3	1	1	0	0
4	1	0	0	0

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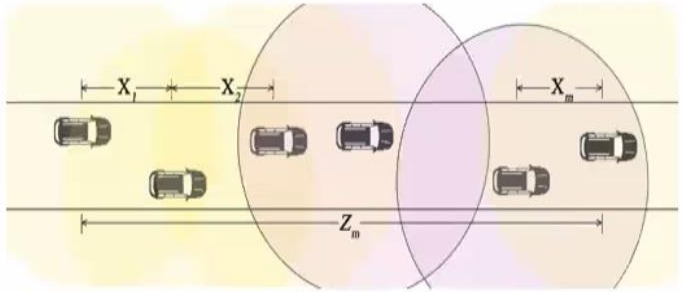
CASE 2: VEHICULAR COMMUNICATIONS IN FADING CONDITIONS

- Several studies relied on the fixed communication range model (also known as the unit disc model) assuming that it captures the average connectivity behavior.
- The disc defines the area where the received SNR is greater than a certain threshold



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Propagation and Scattering in In-Building Solutions (IBS)

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Propagation and Scattering in In-Building Solutions(IBS)

By Ibrahim Ibrahim

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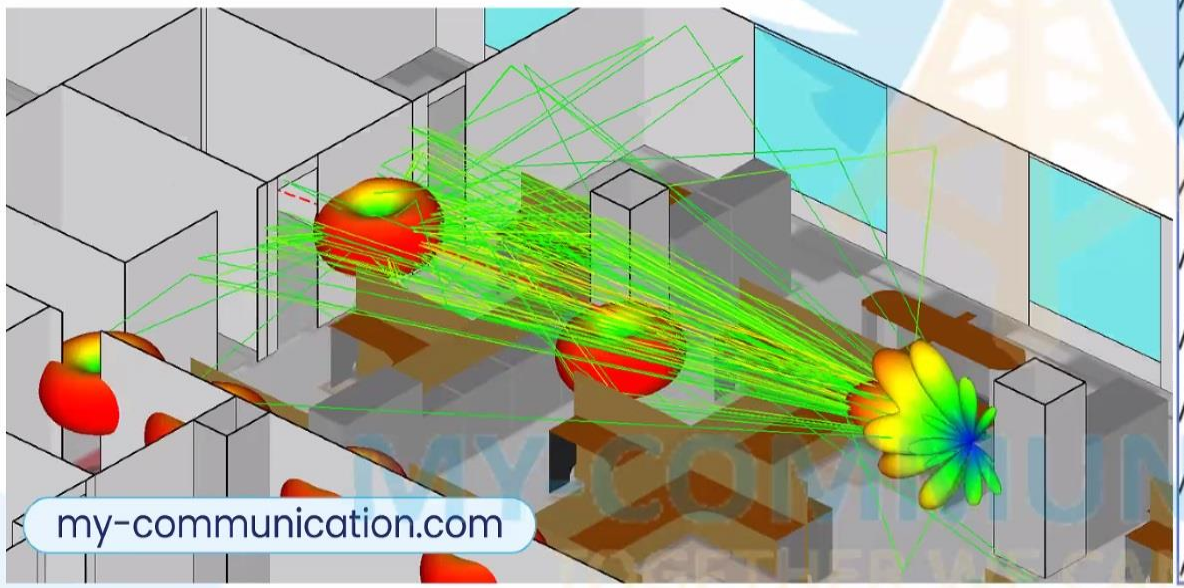
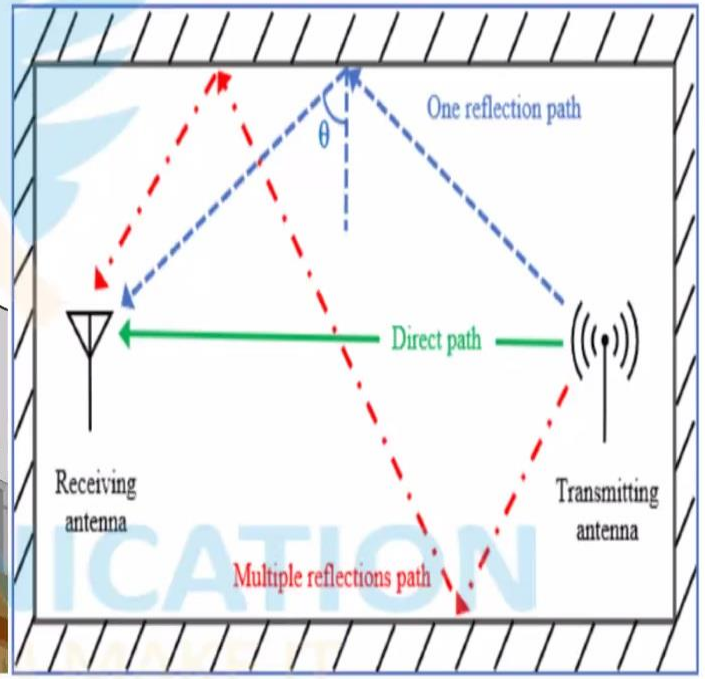
Radio Propagation in IBS

- **Radio propagation in In-Building Solutions (IBS)** addresses challenges related to radio wave distribution within enclosed structures.

  Key aspects include:
  - Material Interaction
  - Frequency Considerations
  - Multipath Propagation





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Inside the Embedded World: A Webinar for Aspiring Engineers

ABDELRHMAN ESLAM HASAN
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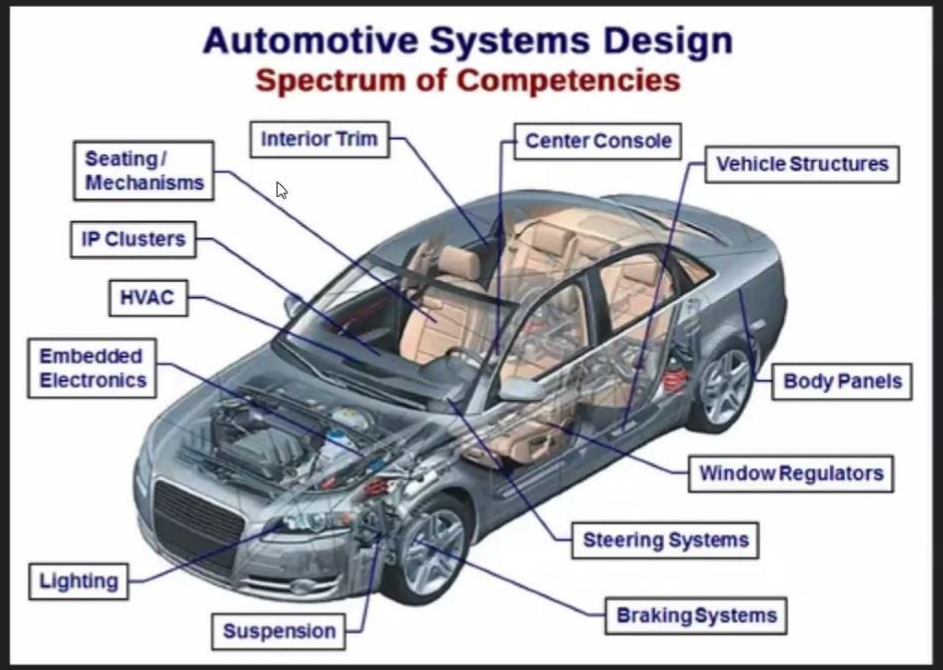
Significance in Modern Technology

- Ubiquity
- Real-Time Operation
- Efficiency
- Specialized Functionality
- Reliability
- IoT Integration
- Innovation in Product Development

Recording

Sign in View

real-world examples



Abdelrhman Esl...

Abdelrhman Eslam

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Find a participant

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- Yasser Madany (Host)
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- Alaa
- Alaa Hammad
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