

Wireless Communication Research Group



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Member

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Home base : Lab Sistem Komunikasi Nirkabel

Lima Bidang Unggulan Inovasi Teknologi

Information & Communication

- Teknologi jaringan dan komunikasi
 - IoT, IIoT, ad-hoc network: VANET, MANET, DTN, WSN
 - RF technology and software defined radio (SDR)
- Cybersecurity
 - Network security, web security, cloud security, apps security, data security, forensic, resilient system, Blockchain technology
- Data science (Big Data, AI)
- E-government and e-business
- Biomedical engineering and its applications
- Cloud computing
 - Edge computing, fog computing
- Smart devices
 - FPGA, instrumentasi, sensor, teknik pengukuran

Metaverse

- eXtended Reality (XR)
- Multimedia, immersive, and intelligent technology
- Game technology & animasi
- Blockchain-based multimedia technology
- Digital-twin technology
- Digital workplace technology

Energy

- Energy Conversion
 - Photo Voltaic/solar panel technology
 - Wind turbine technology
 - Ocean energy technology
 - Geothermal energy technology
 - Hydro energy technology
 - Biomass technology
 - Energy and Storage
 - Battery
 - Fuel Cell
- Smart Grid Technology
 - Smart Protection
 - Power System
 - Power quality technology

Cyber-Physical Systems

Robotics

- Industrial and Automation Robotics
 - Logistic Robot
 - Robot Manipulator
- Agriculture Robot
- Healthcare Robot
- Service Robot
- Disaster Robot
- Robotics Vehicle
 - Ground Vehicle
 - Aerial Vehicle
 - Watercraft

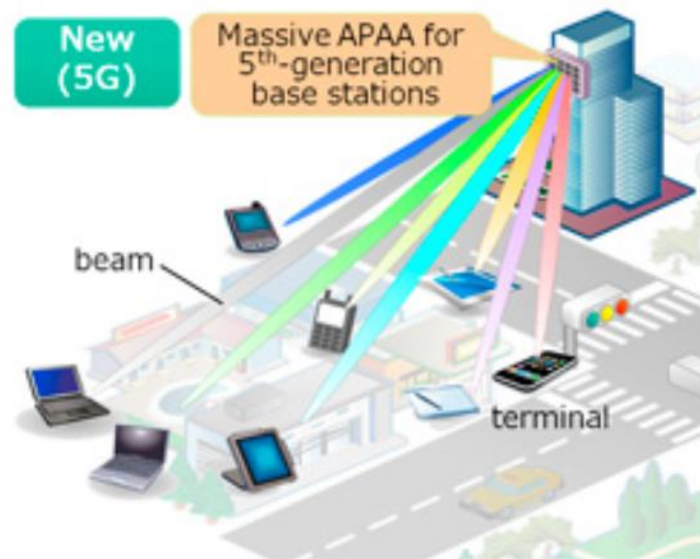
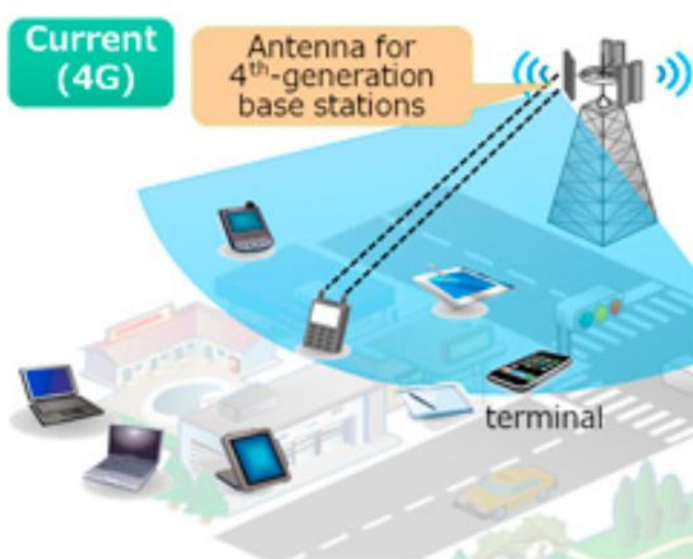
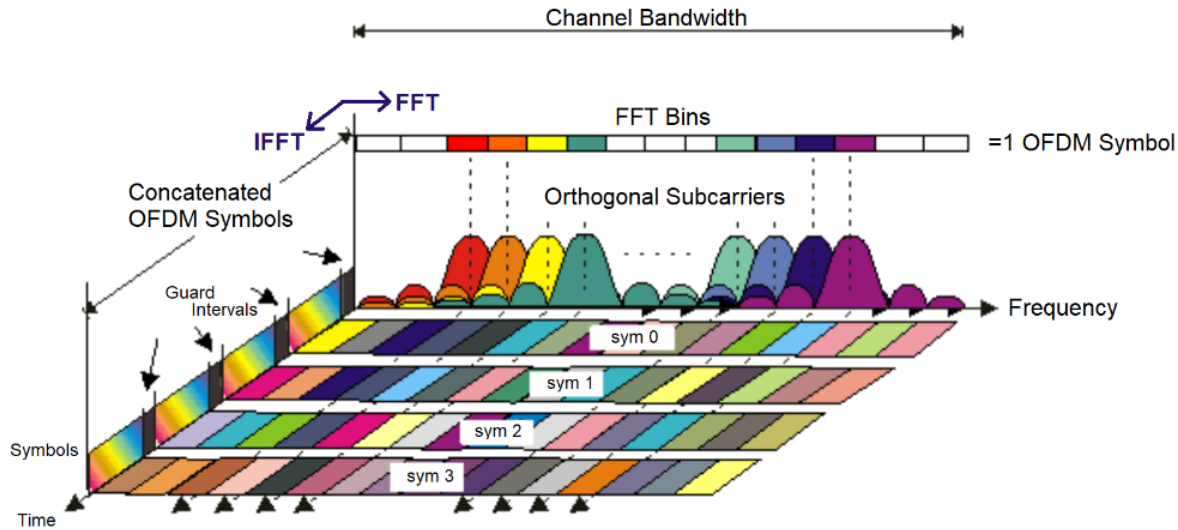
Smart Transportation

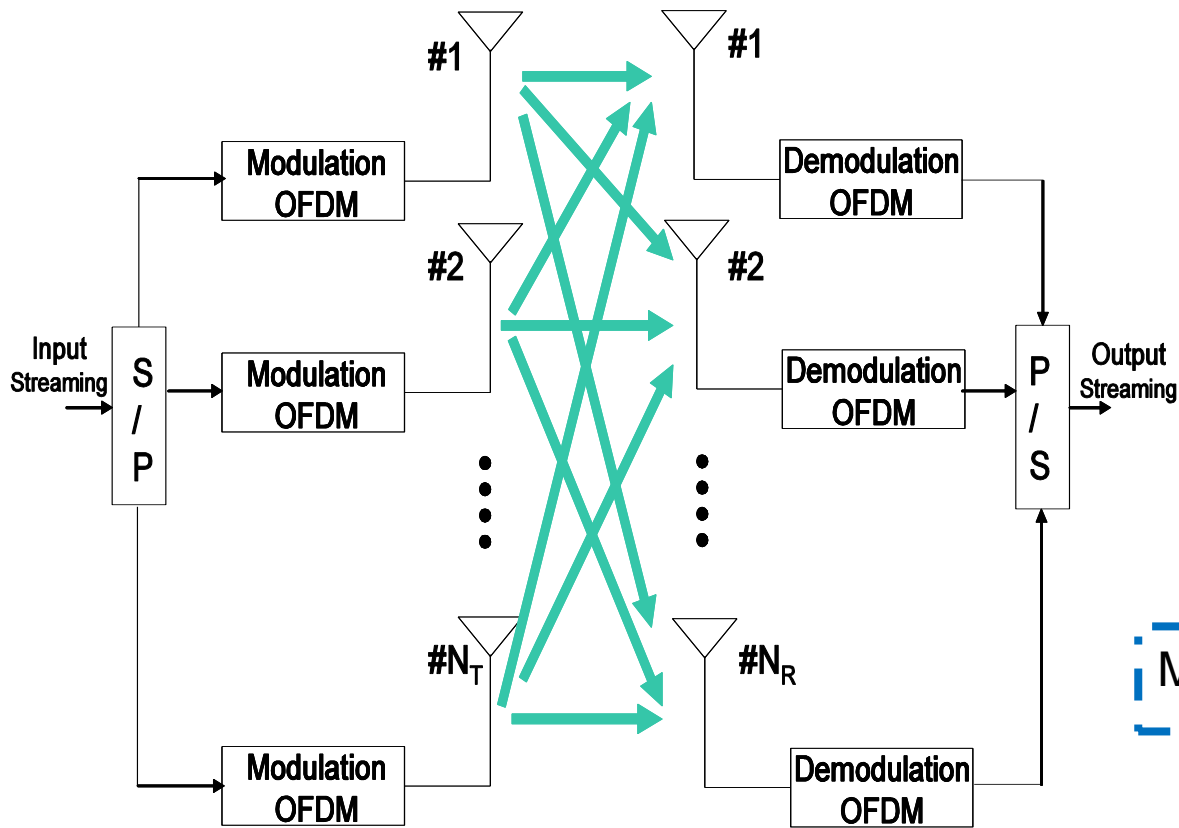
- Smart Electric Vehicle
 - Electric Powertrain Systems
 - Vehicle Control Systems
 - Vehicle Sensing Systems
 - Vehicle Assist Systems
- Transportation Management system
 - Intelligent Transportation Systems
 - Realtime Vehicle Communication

Deskripsi RG Wireless Communication

- Komunitas peneliti yang tergabung dalam RG yang membahas terkait perkembangan sistem wireless communication yang begitu pesatnya di sistem transmisi teknologi yang berbasis multi-antena yang mampu memberikan performansi yang ekselen untuk pengiriman data informasi melalui *data rate* yang tinggi dan menghemat bandwidth pada banyak aplikasi komunikasi nirkabel.

Background



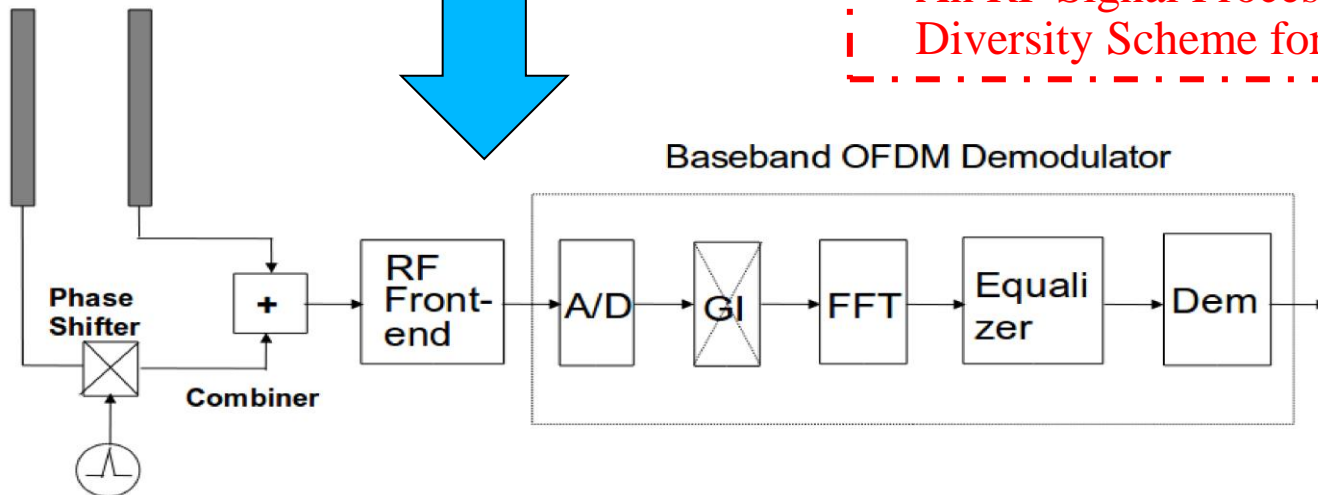


- Advantage**
- ◆ **Bit rate**
 - ◆ **Capacity**
 - ◆ **Bandwidth**

- Disadvantage**
- **Complicated**
 - **Not effective for high size**

MIMO system conventional

RF Signal Processing



An RF Signal Processing Based Diversity Scheme for OFDM Systems

Topik Unggulan Riset PENS

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Positioning Wireless Communication Research Group

- PHY layer:
 - Transmission: modulation (Single RF, MIMO, etc.)
 - detection,
 - channel modelling,
 - smart antenna,
 - radio scrambling,
 - anti jamming,
 - security,
 - coding, etc.

Research Area

Disadvantage In OFDM system

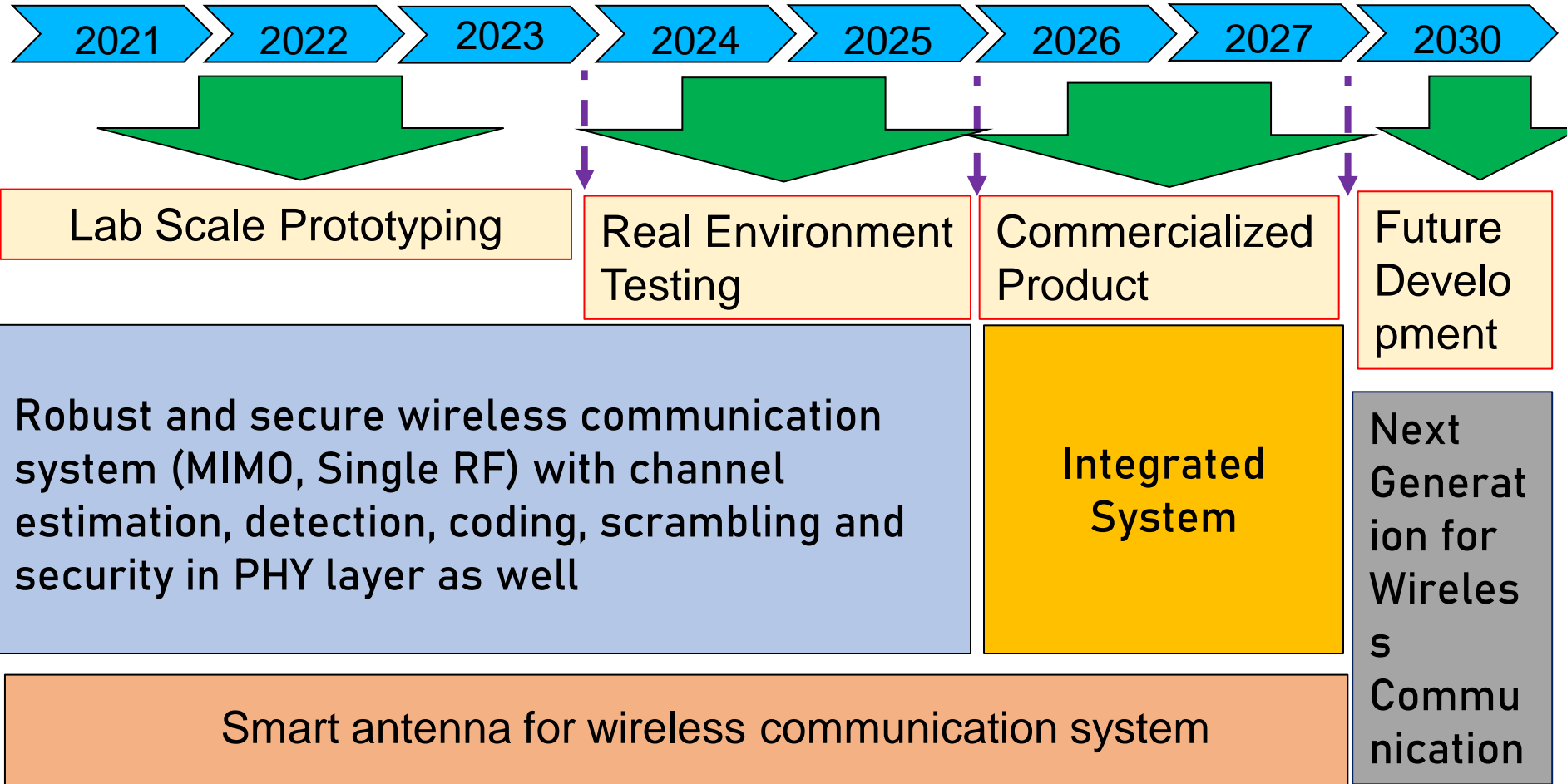
HPA (High Power Amplifier)
PAPR reduction (Peak to Average. Power Ratio)
Symbol Time Offset (STO)
Carrier Frequency Offset (CFO)

Disadvantage In MIMO-Conventioal System

Receiver berbasis single RF sebagai sebagai solusi di sistem MIMO conventional untuk jumlah antena yang besar untuk beberapa aplikasi

Smart Antenna

Road map Penelitian



Luaran tahunan ke depan

- Konferensi →
 - Internasional bereputasi
- Jurnal Ilmiah →
 - Internasional bereputasi
 - Nasional terakreditasi Sinta
- Book Chapter → setiap 2 tahun
- Monograf → setiap 2 tahun
- HAKI → setiap 2 tahun