



# IIT MADRAS

Indian Institute of Technology Madras

Technology Transfer Office  
TTO - IPM Cell



## Industrial Consultancy & Sponsored Research (IC&SR)

### COGNITIVE INTERFERENCE MANAGEMENT IN WIRELESS NETWORKS WITH RELAYS, MACRO, MICRO, PICO AND FEMTO CELLS IITM Technology Available for Licensing

#### PROBLEM STATEMENT

- In present era, a wireless network includes one or more base stations that provide services to a coverage area and **two main challenges** of wireless network operator would be **to improve network coverage, & throughput of the cellular systems.**
- Further, there was many user equipment like relay stations used by the operator to improve the capacity or coverage however the throughput minimizes.
- There are many techniques are discussed, which suffers congestion of resource, complex route and time delay, high interference & reduced system throughput including other issues.
- Hence, there is a need to address above issues.

#### TECHNOLOGY CATEGORY/MARKET

**Technology:** Interference Management in wireless network; **Industry:** IT, Automotive, Healthcare, Aerospace & Defense;

**Application:** Telecommunication, & etc.

**Market:** The global wireless networking market is projected to grow **\$132.9B** by 2027 at a **CAGR of 12.8%** during (2020-2027);

#### TECHNOLOGY

- Present invention describes a **method for interference management in heterogeneous/homogeneous communication networks.**
- The communication networks comprise one or more Base stations(**BS**), Relay stations(**RS**), Femto Base Stations(**FBS**), Pico Base Stations(**PBS**) & Micro Base Stations(**MBS**) depicted in figures.
- The method provides a **technical solution** which is discussed herein & shown in figures.
- **1<sup>st</sup> step** states that **performing interference measurements** for a specific group of said **RS, FBS, PBS, & MBS** and said

UE sending said interference measurement to a serving BS;

- **2<sup>nd</sup> step** states that **classifying each of the UEs** as either a victim UE of said BS, RS, FBS, PBS, & MBS or as a safe UE based on the measurement received from said UEs;
- **3<sup>rd</sup> step** states that **sending a list of victim UEs** to each of said BS, FBS, PBS, & MBS & said RS either receiving a list of its victim UEs from said serving BS or from uplink (UL) signalling; and
- **4<sup>th</sup> step** states that **performing resource allocation** for said UEs of said BS, FBS, PBS, & MBS.

#### KEY FEATURES / VALUE PROPOSITION

**Technical Perspective:** The subject Patent discloses a method to **enable dynamic distributed resource allocation** for interference management for the access link of one or more **BS, RS, FBS, PBS, MBS** in a heterogeneous/homogeneous communication networks.

**Industrial Perspective:** The network has **minimal centralized controller entity.**

- Adapted to have resources allocated by the **scheduler** for access link of each BS, RS, MBS, FBS, PBS can be **partially/completely** orthogonal in time, and/or code and/or space.

#### INTELLECTUAL PROPERTY

**IITM IDF Ref.: 2085;**

**Patent Application No: 202042034964**

#### TRL (TECHNOLOGY READINESS LEVEL)

**TRL- 3, Proof of Concept Ready Stage**

#### RESEARCH LAB

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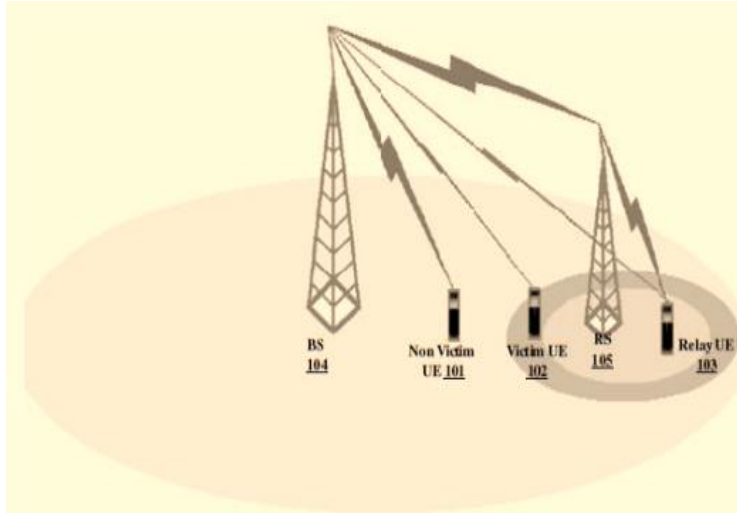
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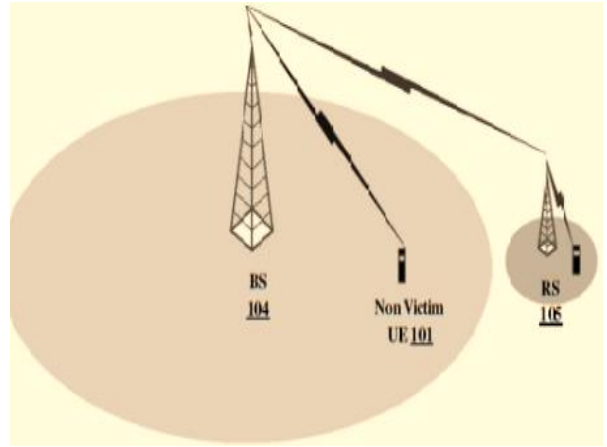
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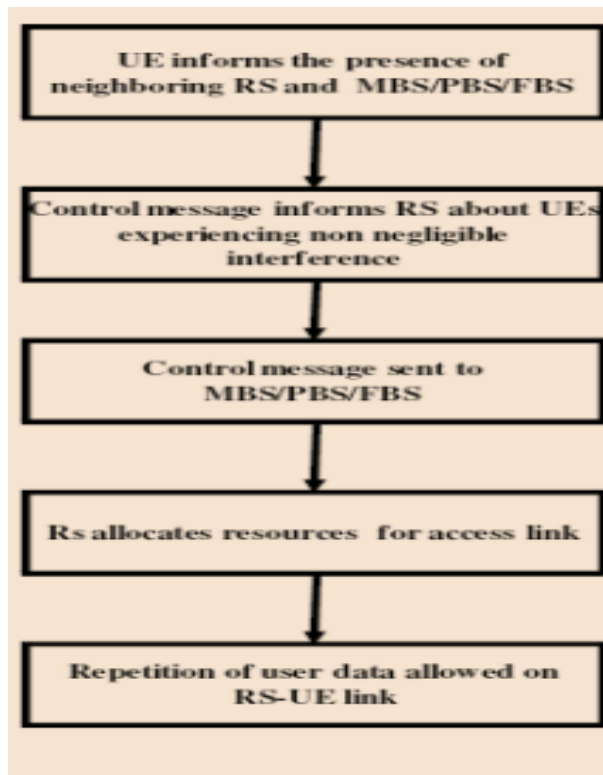
**IMAGES**



**Figure. 1:** Illustrates Capacity expansion relays;



**Figure. 2:** Illustrates Coverage expansion relays;



**Figure. 3:** Illustrates a flow chart depicting method to detect and identify the RS and MBS/PBS/FBS;

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