

# Can the introduction of D2D communication in cellular networks reduce the burden on base stations



## Overview

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By allowing user equipments (UEs) to communicate directly without routing data through the base station (BS), D2D communication can improve spectral efficiency (SE) and energy efficiency (EE), reduce end-to-end latency, and support new proximity-based services. What are the challenges in D2D communication in 6G network?

In addition, D2D communication in 6G network challenges and open research areas are introduced. Device-to-device (D2D) communication is one of the most promising technologies in wireless cellular networks that can be employed to improve spectral and energy efficiency, increase data rates, and reduce links latency.

What are the advantages of D2D communication in cellular networks?

Optimization of Power Levels: since D2D links exist between proximate devices, over a small distance, transmission power is less. This enhances the battery life of the devices. As a result, higher energy efficiency can be achieved with D2D communication in cellular networks. 4.

Can D2D improve spectral efficiency of cellular networks?

Applications for improving spectral efficiency of cellular networks. Soon after, other potential D2D use-cases were introduced in the literature such as multicasting, peer-to-peer communication, video dissemination, machine-to-machine (M2M) communication, cellular offloading, and so on. The most

What is the difference between D2D and conventional cellular communication?

Conventional cellular communication is supported by the macro cell tier, while D2D communication is supported by the device tier. These cellular networks thus are similar to the existing networks. The difference lies in the fact that reliable services can be achieved by the devices at the cell edges and those in the congested areas within the cell.

What are the applications of D2d radio technology?

ple radio technologies deployed on mobile devices. Application. A decade ago, D2 was first proposed for relaying purposes in cellular networks. To date, researchers proposed new use-cases for D2D communications in cellular networks such as multicasting , , peer-to-peer communication , video dissemination , [1].

How does inband D2d improve cellular network efficiency?

n overlay communication are given dedicated cellular resources. Inband D2D can improve the spectrum efficiency of cellular networks by reusing spectrum resources (i.e., underlay) or allocating dedicated cellular resources to D2D users that accommodates direct conn

## Can the introduction of D2D communication in cellular networks re...

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### Research on D2D Communication

Device-to-device(D2D) communication is a new technology that allows mobile terminals to directly communicate with each other by sharing the resources of cells under the control of cellular ...

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## A survey on device-to-device (D2D) communication: Architecture and

Jan 15, 2017 · To endure the rising demands, cellular networks need to undergo suitable changes. For fulfillment of the rising needs of users and efficient utilization of the available scarce ...



### Device-to-Device Communication in 5G

Device-to-Device (D2D) Communication is a technology that allows communication between devices without communication infrastructure such as access points (APs) and base stations ...

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## The Analysis of Device-to-Device (D2D) Communication ...

May 2, 2025 · In contrast to traditional cellular connection, device-to-device (D2D) communication is a direct connection amidst adjacent mobile users that does not pass through the base ...



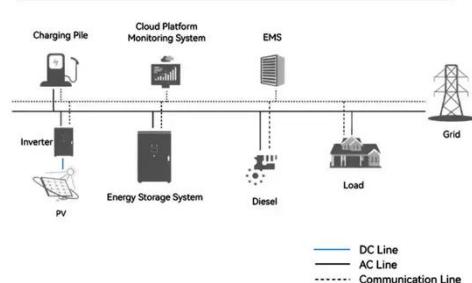
## A Comprehensive Review on Device-to-Device Communication ...

Apr 15, 2020 · Sensors and smartphones are used in industry and healthcare technology for data gathering. The sensed data can be acquired by devices and processed through multiple ...

## The anti-interference study on D2D communication

Abstract--D2D (Device-to-Device) communication is a new technology that allowing terminals communicate directly by reusing cell resources under the BS(base station) controlling. After ...

### System Topology



## Device-to-Device Communication in 5G/6G: Architectural ...

Jul 9, 2025 · Abstract Device-to-Device (D2D) communication is a promising solution to meet the growing demands of 5G and future 6G networks by enabling

direct communication between ...



### **Cognitive D2D communication: A comprehensive survey, ...**

Dec 1, 2023 · The integration of cognitive radio and device-to-device (D2D) communication gives rise to Cognitive D2D (cD2D) communication, which offers numerous advantages, such as ...



### **An efficient resource optimization scheme for D2D communication**

Dec 1, 2022 · Cellular D2D communication can improve spectrum efficiency, increase system capacity, and reduce base station communication burdens by sharing authorized cell ...

### **Device-to-Device Communications in Cellular Networks**

Jan 1, 2016 · Download Citation , Device-to-Device Communications in Cellular Networks , This SpringerBrief focuses on

crucial issues for device-to-device (D2D) communications within the ...

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## An overview of device-to-device communication in cellular networks

Dec 1, 2018 · Device-to-device (D2D) communication is expected to play a significant role in upcoming cellular networks as it promises ultra-low latency for communication among users. ...

## Device-to-Device Communication in 5G Cellular ...

May 20, 2014 · In the first four generations of cellular networks, D2D communication functionality has not been considered. This is largely because it has mainly been envisioned as a tool to ...



## Research on D2D Communication

So the deployment of D2D in cellular networks can effectively reduce the load of base stations, reduce the battery consumption of terminals, improve the

spectral efficiency.



## Device-to-device communications in cellular networks

May 1, 2014 · Device-to-device communications enable two proximity users to transmit signal directly without going through the base station. It can increase network spectral efficiency and

...



## Joint Power and Channel Allocation for D2D Communication in Cellular

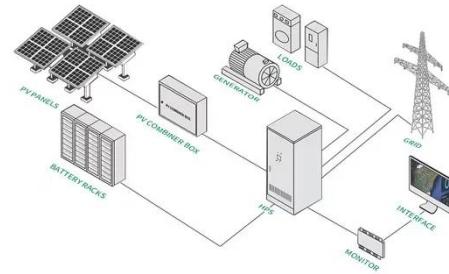
Jul 15, 2022 · Device-to-device (D2D) communication is a technology that allows devices communicating with other devices directly instead of going through the base station (BS), and ...

## Design and Analysis of D2D Communication ...

The topic of my thesis is " Design and Analysis of D2D Communication Mechanisms in 5G cellular networks" I

am working under the supervision of Dr. Riaz Hussain and Professor Dr. Shahzad

...



### **(PDF) A Comprehensive Review of D2D ...**

Oct 1, 2023 · D2D communication capitalizes on the capabilities of nearby devices to communicate directly with one another, thereby optimizing the ...

### **Device-to-device communication in 5G heterogeneous network ...**

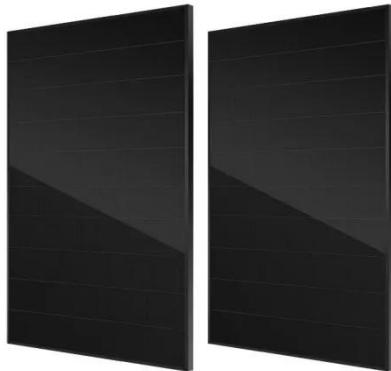
Jun 1, 2025 · In the evolution of Fifth-Generation (5G) oriented wireless communication technology, the conventional wireless communication performance indicators, including ...



### **Device-To-Device (D2D) Data Communications in 5g ...**

Feb 2, 2022 · ABSTRACT The Device-to-Device (D2D) communication technology in the 5G network is a futuristic design with world-changing potential. Its known

applications include; ...



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### **A Survey on Device-to-Device Communication in Cellular ...**

Jan 16, 2024 · used new use-cases for D2D communications in cellular networks. The initial studies showed that D2D communication has advantages such as increased spectral efficiency ...



### **Survey on Device to Device (D2D) Communication for 5G/6G Networks**

Mar 16, 2022 · In addition, D2D communication in 6G network challenges and open research areas are introduced. Device-to-device (D2D) communication is one of the most promising ...

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### **Device-to-Device Communication in 5G/6G: Architectural ...**

Jul 9, 2025 · Device-to-Device (D2D) communication is a promising solution to meet the growing demands of 5G and

future 6G networks by enabling direct communication between user ...



## D2D Communication: Advantages and ...

This page covers the advantages and disadvantages of D2D (Device-to-Device) communication used in LTE and 5G NR. It outlines the benefits and ...

## Interference management for D2D communications in ...

Dec 1, 2018 · Device-to-device (D2D) communications in cellular networks enable user equipments (UEs) to directly communicate with each other without the relay of base stations ...



## (PDF) A Comprehensive Review of D2D ...

Oct 1, 2023 · The evolution of Device-to-device (D2D) communication represents a significant breakthrough within the realm of mobile technology, particularly

in ...



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### **A survey on device-to-device (D2D) communication: ...**

Jan 15, 2017 · To endure the rising demands, cellular networks need to undergo suitable changes. For fulfillment of the rising needs of users and efficient utilization of the available scarce ...



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### **Introduction to D2D Communication**

Feb 7, 2023 · In controlled outband D2D communication, the control of second interface/ technology is under cellular network and in autonomous outband D2D communication, ...

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### **Device-to-Device Communication in Cellular Networks: A ...**

Aug 1, 2016 · Proposed architecture for resource allocation in device-to-device (D2D) communication. In order to meet the rising subscriber demands and

provide them satisfactory ...



## **D2D Architecture & Applications: Building Direct Connectivity Networks**

Explore the architecture, benefits, challenges, and real-world applications of Device-to-Device (D2D) communication in 5G networks, enabling direct connectivity between devices.

## **Device-to-Device Communication in Cellular Networks: A ...**

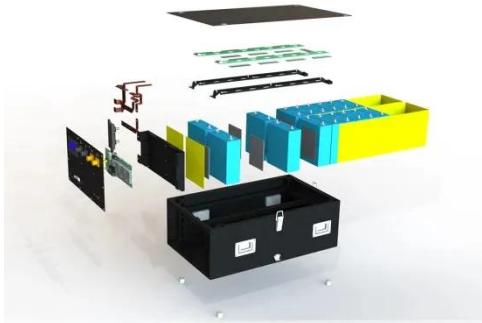
Aug 1, 2016 · With the introduction of device-to-device (D2D) communication, direct transmission between devices is possible. This is expected to improve the reliability of the link between the ...



## **A D2D user pairing algorithm based on motion ...**

Aug 30, 2024 · 1 INTRODUCTION 1.1 Background Device-to-device (D2D) communication introduces a new

dimension in the mobile environment, ...



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