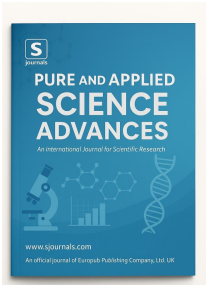
Pure and Applied Science Advances (2025) 13(1) 1-6
ISSN:
doi: 10.14196/pasa.v13i1.1857



Contents lists available at Sjournals

Pure and Appiled Science Advances

Journal homepage: www.sjournals.com

Short Communication

Mobile technology has fundamentally changed user behavior

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ARTICLE INFO

Article history,
Received 10 October 2025
Accepted 18 October 2025
Available online 25 October 2025
iThenticate screening 12 October 2025
English editing 16 October 2025
Quality control 22 October 2025

Keywords,
Mobile phone
Mobile technology
GSM
SIM
Malware

ABSTRACT

Mobile technology is developing more and more every day and is taking a leading role in the private and business environment. The Internet, with its many possibilities such as watching videos, listening to music, playing video games, reading the news, the possibility of making video calls in any part of the world and the development of online shopping, has connected the world and provided numerous advantages to today's society.

1. Introduction

Cellular technology could be a sort of communication arrange that employments numerous little wireless systems commonly known as cells at the final interface of whole communication network (Thakur and Pathan, 2022). Those final joins or last-mile cells utilize a specific radio recurrence designated by the communication administrative specialists. The recurrence band is isolated into numerous channels to carry voice and information. The recurrence is reused within the other cells with a certain design pattern so that the same frequencies don't make interference within the organize. The cell scope of a mobile cellular network.

Within the cellular technology, the final mile of the communication is essentially the wireless network of numerous cells that completely arrange with each other and are controlled by the other components of cellular organize, such as BSCs (Base Station Controller), BTS, and MSC (Mobile Switching Center), and other information

controlling units. The cellular arrange is named after its last-mile network of different little remote systems associated and controlled through Base Station Subsystems (BSS).

For the most part talking, the mobile network innovation employments remote communication framework and its controlling specialists commonly alluded to as BSS and the Network Subsystem (NSS). The BSS comprises of BSC, BTS, and radio radio wires, whereas the NSS comprises of exchanging, information and voice association controls, and other comparable sorts of controlling capacities.

2. Network Model

Industry is now introducing and proposing a wide run of modern communication innovations, numerous of which are based on the wireless and mobile transformation, whereas governments and financing organizations, are supporting investigate on modern standards that way better misuse these openings to reply to the require for omnipresent organizing in both the civilian and guard circle (Barria, 2006). At the same time, clients are presently getting to be more mindful of the value of rising administrations and are taking way better advantage of the joining between the Web and the broadcast communications industry. As a result, the inquire about community is proceeding to free itself from past mental limitations, so that it may completely misuse the joining of computing and communications.

As computer and communication systems such as the Web develop, they are actually advancing towards decentralized and feebly agreeable situations worked by heterogeneous authoritative and physical substances. In these situations, greatly huge numbers of differing mobile gadgets, from capable laptops through take PCs to micro-devices inserted objects, will connected and interface suddenly. Assessing the performance of these frameworks constitutes a colossal challenge and current arrange displaying inquire about gives a set of heterogeneous apparatuses and strategies to address such frameworks, instead of the efficient approach that's required.

The teach of arrange displaying and execution assessment is hence being challenged by the expanded accessibility of wireless and ad hoc networks with their inserted spatially subordinate, time-varying, and nonstationary nature of their activity and interconnects. In this setting, novel execution assessment and enhancement strategies must be created which are able to require under consideration the instabilities of time and space shifting situations where the requests for different administrations will be made in real time, and with exceptionally diverse quality of benefit desires.

3. GSM

Capture attempts of mobile phone calls utilized to be a basic radio scanning work out back within the period of the primary analog frameworks (Androulidakis, 2016). Computerized frameworks such as GSM proved to be a part more secure, encompassing encryption and troublesome to overcome complexity. Because it is the case with each other innovation, the logical community before long started theoretical discourses almost the algorithms' security. Taking after, attackers overseen to mount commonsense assaults as well. There are numerous papers talking about crypto assaults to the GSM standard itself or to its different executions by distinctive vendors (as briefly examined within the to begin with chapter) but in this book we'll center into practical issues and not hypothetical or algorithmic discussions.

GSM mobile phone communications can effortlessly be capturing, without performing any cryptanalysis, employing a fake base station. One of the elemental security problems and an essential deficiency of the GSM security arranging was the truth that the mobile communication arrange does not ought to authenticate itself to the client. As it were the client has got to verify himself in arrange to pick up get to the arrange. It is well known that a client wishing to pick up get to in a provider's GSM/UMTS mobile communication organize must possess the right SIM card (protected with the Pin code) embedded in his phone device. The user's legitimacy is in this manner checked by comparing the SIM's qualifications with the information spared within the network's database. This way, the client is verified in the organize and can utilize its administrations. In GSM systems, this fundamental guideline of confirmation isn't executed in respect to the side of the supplier. Base stations don't utilize any character confirmation component. Individually, mobile phones are not able to evaluate and certify the authenticity of the framework they are interfacing to and whether this framework is in fact portion of their provider's arrange. On the other hand, UMTS utilizes common verification, where the base station as well has got

to verify its legitimacy to the handset. However, it is generally simple to use a jammer, sticking the 3G band. Nearly each single mobile phone these days is multiband able and as such it'll drop back to GSM operation where it can be catching utilizing the fake base station method.

Furthermore, encryption isn't required and, if present, the particular calculation to be utilized can be arranged. In case the base station does not back any encryption calculations, taking after transaction with the mobile phone, the call can continue without encryption. This way, a fake base station within the proximity of a client, without encryption supported (or particularly impaired), is all that's needed to captured the communication employing a straightforward man within the middle approach. In man within the center assaults, as the title recommends, the pernicious substance is set between the first callers. In case caller A was aiming to call B and C is the pernicious substance what happens is this: Rather than the coordinate stream of data from A to B, there's a stream of A to C and after that from C to B. Caller A considers she is talking to B whereas she is really talking to begin with to C. Pernicious substance C of course transfers the communication back to B so the assault succeeds.

Hence, the as it were thing an aggressor needs to do is actuate a fake base station in a given range, imagining that it is part of the organize of the victim's supplier. One of the essential characteristics of GSM demonstrates to be a solid partner in this exertion: Each mobile phone always screens a uncommon information transmission channel-beacon (BCCH-broadcast control channel) from the adjacent base stations in arrange to select for its communication the one advertising the most excellent characteristics (as a rule the closest one). This way the device accomplishes awesome economy within the expended vitality by transmitting in lower control and increments its independence time and quality of discourse. Consequently, ought to the aggressor introduce in a given area his equipment and begin transmitting, overlapping in control the bona fide base stations' signals, versatile phones found nearby will surge to put through with him.

4. Development

The longer term of the cellular innovation will stay exceptionally promising due to various rising patterns and advances (Thakur and Pathan, 2022). For example, cleverly and mechanized vehicular communication, IoT, Tactile Internet, Virtual Reality (VR), and Artificial Intelligence (AI) are getting to be enormous patterns and innovations within the close future that can work in participation with the most recent cellular technologies.

A couple of them have as of now hit the ground and are within the fast-development stage. All these advances and patterns require the control of high-speed Web, with 100% mobility support, 0% network latency, and uncompromised Quality of Service (QoS). Such a colossal request of the showcase can as it were being catered to with the cutting edge cellular advances.

The 5G cellular arrange has fair been rolled out in a number of nations. The work on the another era commonly alluded to as the sixth-generation cellular innovation has as of now started in a number of colleges and investigate organizing. A later term paper distributed by IEEE (Institute of Electrical and Electronics Engineers) proposes that the real-time and intuitively administrations that are the future of this modern world require much higher information rates and phenomenal QoS. Such cutting edge and requesting administrations cannot be sent with the control of 5G, so, we require indeed superior advances.

The sixth-generation cellular innovation will utilize fiber optic specifically associated to the antenna that is with a tall control optical to electromagnetic wave converter. The recurrence to be utilized within the cutting edge innovation will be an ultra-high recurrence in the range of infrared and microwave radiation. These frequencies will be in THz (Tera-Hertz) range. According to an inquire about supposition piece/article published in 2019 by the Kurlsruhe Institute of Technology (KIT), Germany, a colossal number-in tens of billions-of gadgets might be associated specifically through cellular arrange that will communicate with each other in real time with interactive capabilities and mission-critical exactness. It'll require tall speed, no inactivity, excess channels, a tall level of security, and numerous more highlights.

The analysts at KIT have as of now utilized a modulator for electromagnetic waves and photo signal transformation. The modulator utilized the recurrence of 0.29 THz to change over it specifically into optical signals so that the quicker information exchange can be backed straightforwardly from the antenna input. This will decrease the idleness of the organize significantly. The converter was named as an ultra-rapid electro-optical modulator.

5. Mobile Technology

Mobile technology has revolutionized the media transmission with the assistance of present day computer program technologies, especially the advancement of framework computer program and instruments for a wide run of communication protocol development (Thakur and Pathan, 2022). The amazing development of portable showcase over the globe was never anticipated so precisely.

In our day-to-day life, we require the support of mobile phones. The reliance on the mobile phones is steadily expanding. The slant of shopping is moving to online shopping through mobile phones reliably. The versatile Web traffic has as of now surpassed the regular Web traffic through personal computers (PCs) all inclusive. Landline phone lines are losing their significance exceptionally quick due to the forceful appropriation of mobile communication in voice calls. The mobile device has affected the utilize of independent cameras, video recorders, amplifiers, media players, and numerous other devices very badly.

Similar to the mobile phone has significantly affected the lives of the individuals globally, its effect on the advanced businesses is additionally gigantic. An unused frame of trade, commonly alluded to as online trade, is profoundly influenced by the utilize of the Web and mobile phones. These days, nearly all sorts of businesses have their online nearness through websites, advanced notices, and showcasing campaigns.

In truth, numerous modern measurements of businesses have opened up by the progressions of the Web and mobile phones. On the off chance that we check the slant nowadays, portable phones are taking over the PCs as distant as the utilize of Web is considered. Let us presently investigate many measurements of the present day businesses that are profoundly influenced by the utilize of mobile phones, particularly the smartphones.

Mobile clients utilize various sorts of applications from fair measuring one’s workout to the eating propensities, and much more. Our lives are slowly and steadily getting to be gigantically beneath the influence of portable applications-in truth, in some cases we are dragged into employing a specific application for achieving a few objectives online or utilizing the portable phone. All major exercises and capacities are intensely influenced by mobile apps; a couple of them incorporate instruction, preparing, individual administration, shopping, workout, organizers, calendars, games, traveling, weather updates, news, and numerous others.

6. Cell Phones

Like all wireless devices, cell phones are subject to interferences and spoofing (Garzia, 2013). Within the field of cellular communication, such exercises are called call control and cloning. Another chance related with mobile phones is the plausibility of re-programming phones, changing them into amplifiers for capture attempts able of capturing voices and sounds in a given environment and sending them to any farther area.

Call control is an activity that's simple to conduct, especially for phones that utilize simple innovation (which is presently for all intents and purposes neglected all over). This is often due to the truth that simple technology employments plaintext voice transmission utilizing tweak recurrence.

With the headway of advanced innovation, this issue has been decreased to a least, in the event that not killed through and through, since within the same director of advanced communication, calls are dealt with in a way that's completely advanced and secure. Issues emerge in case the mobile phone joins into roaming on another carrier. In reality, in numerous cases, on the off chance that the part administrator and facilitating administrator don't utilize the same computerized innovation, calls are exchanged from one operator to another in a practically equivalent to way and in plaintext, posturing critical dangers from the point of view of security.

Another issue is, as has fair been expressed, the plausibility of utilizing the cell phone as a remote receiver or micro spy. In this case, anybody with the correct specialized information can send an upkeep ask signal on the control channel of the cell phone itself, putting the phone in demonstrative mode. In this mode, all the discussions that are captured by the phone are sent on the voice channel permitting inaccessible tuning in, and this happens without any sign of movement on the cell phone show. The as it were way to be mindful of this action comprises of attempting to make a call; in this case, the phone isn't able to call itself until it exits diagnostic mode. There are two ways to create it exit demonstrative mode, either remotely by sending a suitable command or by turning the phone off and on again.

With respect to the issue of cloning, it can be handled in several ways with expanding trouble with the progress of cellular communication advances.

7. Malware

Mobile devices are getting to be increasingly joined portion to the larger part of human's lives, substituting computers for the utilize of the Web by allowing administrators to run through emails, reach keeping money administrations online, utilize social media at fastest ever speed through WhatsApp, Facebook, Instagram, LinkedIn, Twitter, etc. (Meenakshi Garg and Shrivastava, 2021). Moreover, the quick emanant appealing and steady applications in mobile devices with powerful involvement, for example, GPS mapping and different other conveyance and taxi apps utilizing GPS for locational upgrades, installment exchange, and individual valet era like Dominos, Ola, Uber, Swiggy, and Zomato make mobiles additional amiable and locks in to clients. Amid reliable and dreary utilization of mobiles, secret and touchy information like managing an account password, charge card, credit cards, contact subtle elements, and assist individual information remains put away on most of the mobile devices. Based on this modern set up, hackers have redirected their consideration towards mobile devices as sufficient of wish information is accessible there. Existing security software offers restricted solutions against these threats and subsequently demonstrating unable in keeping up speed and conveying comes about with regard to precise advancement within the malware industry. Hackers arrange implantation of different pernicious software variants like infection or spyware. Malware may be a particular code created by cyber attackers and it acts as a shorthand of malicious program. It is pointed to form wide mutilation to framework, program, and information to realize unsanctioned permission within the arrange. The easiest and predominant implies of conveying malware in a mobile set is within the shape of a record, connect, mail, or unauthorized websites. ML (Machine Learning) has as of now started advancement in malware discovery by utilizing a few sorts of systems, information on have, and a few other anti-malware components. During the discovery of malware, a once unnoticed test can be a new record. Its emitted stuff can be malware (malign) or benign (legitimate). ML takes after a wide run of strategies to distinguish malware rather than a solo strategy. These strategies have different capacities and assorted duties which they suit superlatively. Consequently, ML may be named as a model that alludes to learning from encounter (that in our case is previous mobile information) to development imminent sanctioning. The single accentuation of this field is unconstrained learning strategies. Learning implies change or overhauling of calculation naturally based on past "experiences" denied of any exterior back from the human. As on date ML appears to be the most excellent apparatus which is sharpening itself on its claim to counter genuine and unused dangers of malware in mobile devices. Hence based on rapid learning ML helps in avoiding similar nature malware attacks and also reacts to varying behavior.

8. Phone Lock

Advanced mobile devices offer a run of security highlights for the client (Easttom, 2022). The foremost self-evident is the phone lock. The opening instrument can be a Pin, a design, facial acknowledgment, or a few phones indeed offer proximity opening. For illustration, Samsung offers proximity open. This will be designed to open in case the phone is in nearness to a specific remote get to point, a smartwatch, or indeed a car Bluetooth signal. These highlights are implied for the comfort of the client. The phone opens at trusted areas or when close trusted devices.

There are apparatuses that claim to be able to urge around a Pin or design. These have far from being obviously true adequacy. Clearly, they work in a few occurrences but not all. It is conceivable one of these apparatuses might assist you get into a locked phone. A few of these instruments will expel the lock but will also wipe the phone and return it to manufacturing plant condition. That's unsatisfactory for measurable purposes. A better approach is to study the suspect and determine likely pin numbers.

If the suspect is utilizing smart lock, at that point taking the phone to their home or car might open it. With facial acknowledgment you'll actually hold the phone before the suspect's confront to open it. It ought to be famous that getting into a bolted phone may be a non-trivial errand in most cases and you won't continuously be able to.

9. Paradox

While the person addressability given by the mobile phone restructures society, it is additionally a test with which we look for to consider that rebuilt society (Ling, 2017). The paradox is that the mobile phone is both a cause

of social alter and the device able to utilize to consider that alter. It could be a gordian hitch comprising of the coevolution of society and the instruments utilized for social examination. The one cannot, in any real way, be caught on without the other. A few knowledge into this issue- and maybe a determination of the paradox-can be inspected by looking into variety of organize thickness and clustering based on portable action. Large-scale examination of common utilize by people and the clustering of their joins can give a few clues. Be that as it may, this is often not a conclusive unraveling of the two. The social clusters with this most elevated clustering and thickness can be the result of telephonic contact and not natural sociation. Treating these components as factors makes a difference a few, but not conclusively.

Venturing back from this maybe irresolvable paradox, mobile communication has changed the nature of interpersonal interaction. Moreover, mobile communication inquire about has inspected both the social results of our selection of mobile phones and it has seen the advancement of the mobile handset as a test that permits us understanding into social interaction. As mobile communication and undoubtedly mobile data collection proceed to advance, analysts will be able to gather understanding into numerous unused ranges of social interaction. These modern ranges of investigate essentially ought to continue cautiously while watching the require for privacy.

10. Conclusion

With its capabilities, mobile technology has fundamentally changed user behavior. In the past, mobile devices were used exclusively for making calls and sending messages and had only an alarm clock and a calendar built in. Today, mobile devices, in addition to their basic purpose, are also used for searching the Internet, watching videos, taking photos, shopping, etc. In today's digital age, a wide variety of information is available to users because, thanks to mobile devices, they can access information in just a few seconds and with a few finger movements on the device's screen.

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How to cite this article: Franjić, S., 2025. Mobile technology has fundamentally changed user behavior. Pure and Applied Science Advances, 13(1), 1-6.