2021年度
大学院理工学研究科【情報システム工学専攻】博士前期課程
一般選抜試験（第Ⅰ期）問題

英　　語

開始時刻　午前9時30分
終了時刻　午前10時15分

【注意事項】

1．答案用紙には受験番号，氏名を必ず記入してください。
2．配布された答案用紙は試験が終了したら，必ず提出してください。
（問題用紙は提出しなくてよい）。

創価大学大学院 理工学研究科 情報システム工学専攻
2021 年度 一般入学試験第 I 期　英語筆記試験問題

以下の 15 問すべての問いについて、解答用紙に答えを記入してください。

1 次の英文を読み、[問 1] ～ [問 10] に答えよ。

Universities, together with other operators of large spaces like shopping malls or airports, are currently facing a dilemma (1) : how to return to business as fast as possible, while at the same time providing a safe environment? Given that the behavior of individuals is the driving factor for viral spread, key to answering this question will be understanding and monitoring the dynamics of how people move and interact while on campus, whether indoors or outdoors.

Fortunately, universities already have the perfect tool in place: the campus-wide Wi-Fi network. These networks typically cover every indoor and most outdoor spaces on campus, and users are already registered. { } (2) is data analytics to monitor on-campus safety. A team of researchers from the University of Melbourne and the startup Nexulogy have developed the necessary algorithms that, when fed data already gathered by campus Wi-Fi networks, can help keep universities safe. To date, little attention has been paid to using Wi-Fi networks to track social distancing. Countries like Australia have rolled out smartphone apps to support contact tracing, typically using Bluetooth to determine proximity. A recent Google/Apple collaboration (3), also using Bluetooth, led to a decentralized protocol for contact monitoring.

Yet the success of these apps mainly relies { } (4) people voluntarily downloading them. A study by the University of Oxford estimated that more than 70 percent of smartphone users in the United Kingdom would have to install the app for it to be effective. But adoption is not happening at anything near that scale; the Australian COVIDSafe app, for example, released in April 2020, has only been downloaded by 6 million people by mid-June 2020, or about 24 percent of the population. Furthermore, this kind of Bluetooth-based tracking does not relate the contacts to a physical location, such as a classroom. This makes it hard to satisfy the requirements of running a safe campus. And data collected by the Bluetooth tracking apps is generally not readily available to the campus owners, so it doesn't help make their own spaces safer (5).

The Wi-Fi based algorithms provide the least privacy-intrusive monitoring mechanisms (6) thus far, because they use only anonymous device addresses; no individual user names are necessary to understand crowd densities and proximity. In the case of a student or campus staff member reporting a positive coronavirus test, the device addresses determined to belong to someone at risk can be passed on authorities with the appropriate privacy clearance. Only then would names be matched to devices, with people at risk informed individually and privately.

Wi-Fi presents the best solution for universities for a couple of reasons: wireless coverage is already

campus wide; it is a safe assumption that everyone on campus is carrying {　　} (7) one Wi-Fi capable device; and virtually everyone living and working on campus registers their devices to have internet access. Such tracking is possible without onerous user-facing app downloads. Often university executives already have the rights to use the {　　} (8) collected in the wireless system included as part of its Terms and Conditions. In the midst of this pandemic, they now also have a legal or, at least a moral obligation, to use such data to their best ability to improve safety and well-being of everyone on campus.

The process starts by collecting the time and symbolic location (also known as network access point) of Wi-Fi capable devices when they are first detected by the Wi-Fi infrastructure, for example, when a student enters the campus' Wi-Fi environment, and then during regular intervals or when they change locations. Then, after consolidating any multiple devices of a single user, our algorithms calculate the number of occupants in a given area. That provides a quick insight into crowd density (9) in any building or outdoor plaza.

(This article originally appeared in IEEE Spectrum in August 2020.)

[問 1] 下線(1)に関して、なぜ「dilemma」となるのか、理由を答えなさい。

[問 2] 下線(2)に入るべき主節を、次の単語を並べ替えて作成しなさい。ただし、先頭に配置すべき単語の頭文字も小文字にしてある。

added / needs / all / to / that / be

[問 3] 下線(3)の意味として最も適切な文を次の中から選びなさい。

(a) the fact of including many different types of people or things
(b) the way in which two facts are related to each other
(c) something that you give or do in order to help something be successful
(d) when you work together with another person or group to achieve something

[問 4] 下線(4)の{　　}内に入るのに最も適切な前置詞を次の中から選びなさい。

(a) on　　(b) in　　(c) for　　(d) at

[問 5] 下線(5)に関して、なぜこのような結論になるのか、理由を答えなさい。

［問 6］ 下線(6)に関して、この「mechanisms」の具体的な内容を説明しなさい。

［問 7］ 下線(7)の{　　}内に入るのに最も適切な語句を次の中から選びなさい。

(a) at most　　(b) at least　　(c) a little　　(d) rather than

［問 8］ 下線(8)の{　　}内に入る適切な単語を答えなさい。

［問 9］ 下線(9)の「crowd density」とはどういう意味か、説明しなさい。

［問 10］ 下の文は、この記事の実際のタイトルです。記事の内容に従い、空欄に入るべき適切な動詞の原形を答えなさい。

How To Use Wi-Fi Networks To （　　） a Safe Return to Campus

2 つぎの［問 11］～［問 15］の日本語文を英語に翻訳せよ。

［問 11］ この論文では、ここ数十年の間だれにも解けなかった問題への筆者の挑戦について述べる。

［問 12］ 彼は父に言われた「努力なくして、成功なし」という言葉を絶えず心に留めている。

［問 13］ 私はここに 3 日間滞在した後、国際会議に参加するため移動します。

［問 14］ この実験で良い結果が出れば、我々は新製品の開発を始められる。

［問 15］ この仮説を証明するには、可能なすべての場合について考えなければならない。