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Search and Ranking of High-Rise Apartments based on Residential Quality Index

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ABSTRACT

Increasing urbanization has prompted urban residents to look for solutions to alleviate urban environmental issues such as air and noise pollution. High-rise buildings have become a preferred choice for those looking for cleaner air and a quieter living environment. This disclosure describes techniques to crowdsource floor information from residents of high-rise apartments and to use such information to prioritize search results based on a herein-defined residential quality index (RQI). The techniques address limitations of current map or search applications by providing accurate floor and environmental quality information for high-rise apartments.

KEYWORDS

- High-rise apartments
- High-rise buildings
- Air quality
- Air quality index (AQI)
- Residential quality index (RQI)
- Mapping applications
- Digital maps
- Floor information
- User-generated content

BACKGROUND

Residents in urban areas frequently choose high-rise buildings to escape air and noise pollution. Studies have shown that air quality index (AQI) improves with increasing altitude.

Map and search apps currently display lists of high-rises without providing information on the number of floors, resulting in the inclusion of structures with as few as 3-4 floors in the search results. Additionally, search results are not ordered in any particular manner, e.g., by number of floors or by air or environmental quality. Individuals seeking to prioritize air quality and to minimize noise pollution are unable to do so with search results as currently presented.

DESCRIPTION

This disclosure describes techniques for presenting search results for high-rise apartments in map or search applications based on a residential quality index (RQI) defined herein. The described techniques incorporate floor data into maps, enabling users to make informed decisions when searching for places to stay that minimize their exposure to air or noise pollution.

Per the techniques, with the permission of users, a crowdsourcing mechanism obtains floor information from users residing in apartments. The crowdsourcing mechanism can include, for example, a question posed to users such as ‘how many floors does this apartment have?’ By thus prompting users to provide the number of floors in their apartment complex, a dataset of floor information for high-rises is accumulated. The user-generated data is then integrated into a place-details section of maps applications, providing users with a readily accessible source of the floor and environmental information pertaining to high-rises.

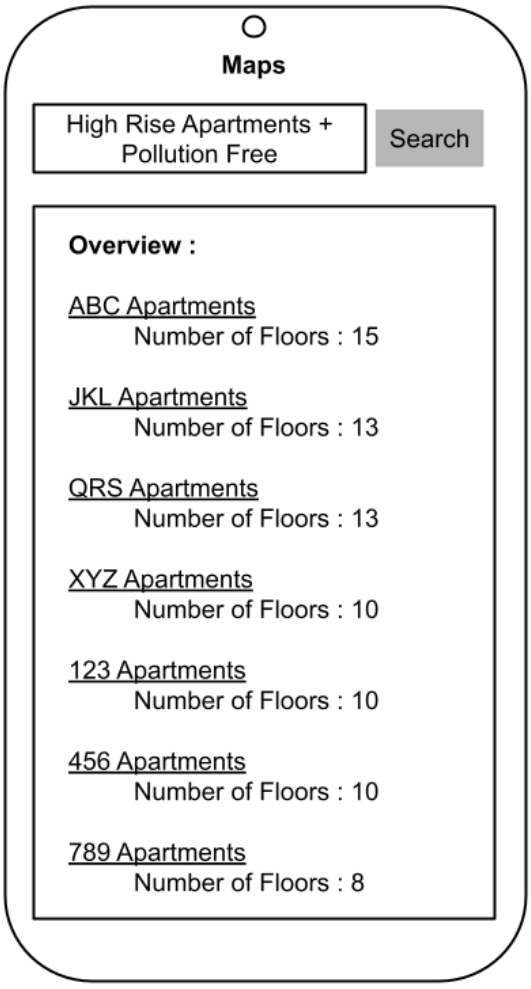

Fig. 1: Floor information featured in the overview section of a digital map application

As illustrated in Fig. 1, floor information is featured in the overview section when users initiate a search on a map or search application using keywords such as 'high rises,' 'pollution-free,' 'quiet apartments,' etc. By default, the search results are organized from highest to lowest residential quality index (RQI). An example formula for RQI is as follows.

$$RQI = [1+ (\text{No. of floors} \times 3 / 10)\%] \times AQI$$

Example: If the air quality index on the ground floor is *x*, the RQI on the thirty-third floor is calculated as follows:

$$\begin{aligned} RQI(33) &= [1+(33\times 3/10)\%] \times x \\ &= [1 + (99/10)\%] \times x \\ &= [1 + 9.9\%] \times x \\ &= [1+0.099] \times x \\ &= 1.099x \end{aligned}$$

The RQI accounts for the floor level of the high-rise and factors the improvement in air quality index with increasing altitude. The formula reflects the documented observation that AQI can improve by up to 10% for every 100 meters increase in elevation. The formula also leverages the fact that the average height change with each floor in a high-rise building is approximately 10 feet (approximately 3 meters). In this manner, by incorporating data on the number of floors and on environmental quality into maps and search engines, users can make informed decisions when searching for potential places to stay.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs, or features described herein may enable the collection of user information (e.g., information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level) so that a particular location of

a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques to crowdsource floor information from residents of high-rise apartments and to use such information to prioritize search results based on a residential quality index (RQI). The techniques address limitations of current map or search applications by providing accurate floor and environmental quality information for high-rise apartments.