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Applying 5G Positioning Service for Digital Out-of-Home Advertising Innovation

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This study focuses on developing the application of advertising innovation in digital out-of-home by using the 5G positioning service. 5G includes a new standard for services around the geographic position of objects, with significant improvements on accuracy and other performance parameters. The services are often called 'positioning services,' unlike 'location services' used for earlier generations. The new 3GPP REST API provides advanced positioning features, including better accuracy, address mapping, velocity, vertical positioning, and more. Digital Out-of-Home (DOOH) advertising is an interactive and eye-catching advertising strategy that empowers brands to digitize themselves and display content easily accessible to the general public. The real reason DOOH advertising is progressing way faster than anticipated is reaching the target audience in real-time. As we can see by the developing trend, with the coming of 5G, programmatic bidding and, AR, DOOH is rapidly evolving beyond its initial position as a video version of a static billboard.
Furthermore, some research results suggested that outdoor digital screens can be seen as an extension of social media. Mainly, the pairing of outdoor digital screens and social media on mobile devices has emerged as a distinct kind of user experience. Thus, the primary purpose of this study is to explore the integration of the 5G positioning service and DOOH for developing future advertising innovation. The study begins with using the service design method to explore how to create innovative service models for DOOH advertising by taking advantage of the characteristics of the 5G positioning service. Then, we propose a system architecture for developing an intelligent interactive advertisement service by using the high-density small cell feature of the 5G network to improve the inability of locating users in real-time. Thirdly, we build a DSP (Demand-side platform) and a DMP (Data management platform) to detect, collect and analyze users' "space" and "time" data. Finally, we set up the innovative advertising service according to the needs of different owners, the data filtering, potential audience discovery, interaction mechanism, and the flow of contents. The results of this study provide the solution to improve the problems of "the inability to deliver advertising content precisely" and "the uncertainty of advertising publishing expectation."

Primary authors: WANG, Ryan Sheng-Ming (Department of Interaction Design, National Taipei University of Technology); HSIAO, Yi Ting; HAN, chen

Presenter: HSIAO, Yi Ting

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