

Title	スマートフォンのセンサ及び Bluetooth 探索を用いた 個人間の相対位置表示システム
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Relative positioning system for pedestrian using smart-phone sensor and Bluetooth

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Many location-based services which we use in a smart-phone, are used GPS or Wi-Fi systems to obtain our positions everywhere.

This paper presents a relative positioning system using smart-phone's devices; accelerometer, digital compass and Bluetooth. Proposed system allows users to obtain a position of another smart-phone in the indoor environment without some additional equipments.

General techniques for location estimation are used dead reckoning to recognize user's position using the results of step detection, a step length and a direction data.

However, this technique causes some recognition error because a lot of small vibrations occur during walking. The Proposed system sets some suitable parameters for dead reckoning through several experiments.

The proposed system uses Bluetooth to initialize a relative position of a partner's smart-phone. First, I investigated the spec of Bluetooth focusing on the relation of the distance with the electric wave intensity and the search time until a smart-phone finds a partner's smart-phone. Next, I made an indoor map by measuring experiment environment as a ground truth. Finally, I performed two experiments by referring these investigation results. First experiment evaluated the performance of dead reckoning. And second one evaluated the performance of proposed system by obtaining the relative position between two persons on the assumption of real situation.