mPATH: Rapid Composition of Activity-based Applications

Masaki Ito[*]
Graduate School of Media and Governance
Keio University

Hideyuki Tokuda[†]
Graduate School of Media and Governance
Keio University

1 Introduction

Recently, technologies for sensing and storing human activities are making great progress in the ubiquitous computing research field. These technologies are applied to various context-aware systems. Sharing of experiences is one example, in which a computer system provides digested activities when we recall, talk about, and report what we did in the past[Ashbrook and Starner 2002][Gemmell et al. 2002][Patterson et al. 2003].

The internal structure of these applications, which we call activity-based applications, are based on the same procedure. At first, they capture human activities from sensors. Then they analyze the captured activities. Finally, they provide the result in various ways.

In this paper, we propose mPATH Framework[Ito et al. 2005b] to facilitate development of activity-based applications. We focus on the analysis process of the application, where data are processed geographically. Developers can visually compose original analysis process in the framework, and easily reuse other analysis process for other applications.

2 mPATH Framework

mPATH Framework is a programming framework for activity-based applications. It provides developers with a guideline to divide the application into modules. The modules can then be easily composed with a visual programming interface into an activity-based application. Figure 1 shows the interface. Since all the application parts follow the same guideline, they can be easily reused. Developers can utilize generic modules which have basic functions of applications in addition to their original modules.
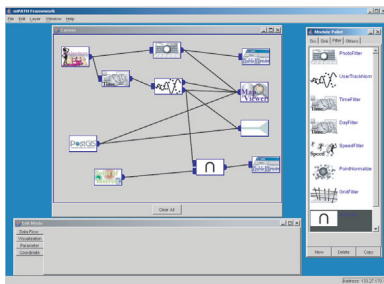

Figure 1: Visual Programming Interface

3 Applications

We developed the following applications, which utilize mPATH framework, and provide information based on users' activities.

3.1 mPATH View

mPATH View[Ito et al. 2005a] shown in Figure 2 is an interactive viewer of past activities captured by GPS, digital camera and other sensors. The tablet shows 3D map with user's past trajectory and photographs. It helps us to remember and exchange our past experiences. Since the map synchronizes its content with the viewer's orientation and angle, we can easily correlate the map to the view from a window.
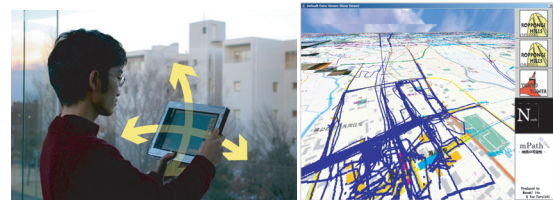

Figure 2: mPATH View

3.2 AnTs

AnTs is a joint project within Keio University, which aims to exchange activities as a recommendation among mobile users. In the project, a map on a cell phone will take a important part to intuitively show activities of other users. Figure 3 is a prototype. The functionality of mPATH enabled rapid prototyping of the system.

Figure 3: AnTs Prototype

4 Summary

This paper introduced mPATH Framework, an application framework for activity-based applications. The framework ease developers of the applications by providing developers with a guideline.

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[*]e-mail: niya@ht.sfc.keio.ac.jp
[†]e-mail: hxt@ht.sfc.keio.ac.jp