

# Hybrid Intelligent Techniques for Intelligent Personal Assistant in Digital Convergence<sup>1</sup>

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**Abstract:** Recently mobile phones have become an essential tool for human communication. As more people use mobile phones, various services based on mobile phone networks and high-end devices have been developed. Smartphone which integrates the functions of personal digital assistant and mobile phone obtains world-wide reputation as new personal business assistant and entertainment equipment because it is all-in-one device: many technologies such as wireless voice/data communication, digital camera, and multi-media player are converged into one device. Especially, with the rise of the concept of ubiquitous computing, the demand for personalized intelligent service on mobile devices gets higher. However, current mobile devices have constraints of limited processing power, and awkward interaction devices. We are in need of putting together available AI techniques to cope with these constraints and realize intelligent services in digital convergence.

There are three major issues in implementing intelligent service in constrained environment: The first is to gather information which provides meaningful features for user's state. Requiring directly explicit information from user can never be an intelligent technique. Niche technique should be able to provide sufficient information without bothering the user and invading the user's privacy. The second is to infer and predict user's state from collected data. Predicting user's state from data can be formulated as conventional classification task. Many AI techniques have been successfully applied to this problem. The third is service selection or composition. We can select one service from pre-defined service library or compose novel services appropriate to user's state inferred dynamically.

In this talk, we will review the state-of-the-art of research efforts to develop intelligent personal assistant with hybrid intelligent techniques, and present some prototype systems implemented in Soft computing labs in Yonsei University based on a novel framework of hybridizing several intelligent techniques.

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