

# Exploring Personalized Internet of Things (PIoT), Social Connectivity, and Artificial Social Intelligence (ASI): A Survey

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## Abstract

Pervasive Computing has become more personal with the widespread adoption of the Internet of Things (IoT) in our day-to-day lives. The emerging domain that encompasses devices, sensors, storage, and computing of personal use and surroundings leads to **Personal IoT (PIoT)**. PIoT offers users high levels of personalization, automation, and convenience. This proliferation of PIoT technology has extended into society, social engagement, and the interconnectivity of PIoT objects, resulting in the emergence of the Social Internet of Things (SIoT). The combination of PIoT and SIoT has spurred the need for autonomous learning, comprehension, and understanding of both the physical and social worlds. Current research on PIoT is dedicated to enabling seamless communication among devices, striking a balance between observation, sensing, and perceiving the extended physical and social environment, and facilitating information exchange. Furthermore, the virtualization of independent learning from the social environment has given rise to Artificial Social Intelligence (ASI) in PIoT systems. However, autonomous data communication between different nodes within a social setup presents various resource management challenges that require careful consideration. This paper provides a comprehensive review of the evolving domains of PIoT, SIoT, and ASI. Moreover, the paper offers insightful modeling and a case study exploring the role of PIoT in post-COVID scenarios. This study contributes to a deeper understanding of the intricacies of PIoT and its various dimensions, paving the way for further advancements in this transformative field.

Keyword: Personal Internet of Things (PIoT), Artificial Social Intelligence (ASI), Hyperpersonalization

## 1 Introduction

The Internet of Things (IoT) is an emerging paradigm that enables the communication between electronic devices and sensors through the Internet in order to facilitate our lives. IoT uses smart devices and the internet to provide innovative solutions to various challenges and issues related to various business, governmental, and public/private industries across the world [1]. IoT is progressively becoming an important aspect of our life that can be sensed everywhere around us. A great transformation can be observed in our personal lives along with the increasing involvement of IoT devices and technology.

The term "Personal Internet of Things" (PIoT) describes an ecosystem that interacts with the environment in the context of a person and her surroundings using data collected from sensors. The PIoT platform links objects to abstract applications to provide the user with a high level of customization, automation, and convenience[1]. The PIoT platform facilitates device management and data flow with the objectives of being able to deploy things in a different context easy user experience service creation, and efficiency. A PIoT platform allows applications to connect devices to control centers, so that it includes the entire digital value chain, from sensors to the cloud and applications[2]. The combination of the disciplines of Robotic devices, Blockchains, Augmented virtual reality, and Artificial Intelligence (Machine Learning/Deep Learning) is changing the design and development of autonomous PIoT systems[3]. A new hyperconnected personal world and the data produced by hyperconnectivity allow the PIoT ecosystem to make smarter decisions and better customer experience [4].

Applications for the Personal Internet of Things (PIoT) have expanded beyond personal computing, increasing social connections and computing among PIoT things because of the increased availability of ubiquitous