

Internet of Behaviors: Concept, Architecture, Technology, Applications, and Challenges

Mengchu Zhou, Ph.D. & Dist. Professor
Fellow of IEEE, IFAC, AAAS, CAA and NAI
Area Coordinator of Robotics, Intelligent Systems, & Data Engineering
New Jersey Institute of Technology

In his blogs of 2012, Dr. Gote Nyman coined Internet of Behaviors (IoB). In his idea, people's behaviors are very good predictors of their needs, and hence technology companies can network human behaviors and construct behavior-based systems to deliver more timely, responsive, and intelligent services with privacy protection. Built on his core idea of IoB, this talk comprehensively introduce the IoB concept, essential features, architecture, enabling technologies, applications, and open research issues. We first give a formal definition and classification of IoB and reveal its fundamental difference from Internet of Things (IoT). Then, we propose a five-layer IoB architecture (consisting of behavior perception, behavior networking, behavior computing, service provision, and security/privacy) and provide the in-depth analysis of IoB enabling technologies. Particularly, we discuss functional requirements and possible fields of an IoB address, present the networking and maintenance approaches to behaviors, explore four important implications of behavior computing, i.e., intention inference, behavior derivation, behavior programming, and behavior-chain optimization, as well as give a decentralized privacy-protection solution to Dr. Nyman's behavior-identity separation idea. Next, we present potential IoB applications in smart home/transportation/healthcare/business, and human-robot interaction. Finally, we reveal open research issues.