

Understanding and Predicting Human Behavior for Social Communities

Unit - IV

Overview

- Introduction
- User Data Management, Inference and Distribution
- Enabling New Human Experiences

Introduction

- With the rapid advance in technology,
 - Increasingly feasible for people to remain “connected”
 - Continuously enjoy the activity they are engaged in,
 - Ex: sports, entertainment, or work.
- Such ubiquitous computing environment will allow everyone permanent access to the Internet anytime, anywhere and anyhow.
- Despite the evolution of services, social aspects remain in the roots of every human behavior and activities.
- Examples
 - online social networks, which engage users in a way never seen before in the online world.

Introduction – Contd...

- Being aware and communicating context
 - key part of human interaction
 - particularly powerful concept when applied to a community of users where services can be made more personalized and useful.
- Harvesting context to reason and learn about user behavior will
 - enhance the future multimedia vision where services can be composed and customized according to user context.
 - it will help us to understand users in a better way.

Quality of Experience (QoE)

- Despite all the technological revolutions, for the end user (Humans) it is the perceived Quality of Experience (QoE) that counts,
- QoE is a consequence of a
 - user's internal state
 - predispositions, expectations, needs, Motivation, Mood
 - the characteristics of the designed system
 - usability, functionality, relevance
 - the context (or the environment) within which the interaction occurs
 - social setting, meaningfulness of the activity

User Data Management, Inference and Distribution

- Despite most initiatives require or propose some sorts of user profile management systems
 - usually proprietary and include limited information about user preferences and contexts.
- In order to apply user information across a range of services and devices, there is a need for standardization of user related data and the architecture that enables their interoperability.
- Efforts have been seen at both fixed and mobile worlds and are usually taken under
 - European Telecommunications Standards Institute (ETSI),
 - Third Generation Partnership Project (3GPP),
 - Open Mobile Alliance (OMA)

Standards

- Considering data requirements from a wide range of facilities and from different standardization organizations,
 - the concept of Common Profile Storage (CPS) is defined by 3GPP as a framework
 - streamlining service-independent user data
 - storing it under a single logical structure
 - avoid duplications and data inconsistency.
- Being a logically centralized data storage,
 - it can be mapped to physically distributed configurations
 - should allow data to be accessed in a standard format.
- Indeed, several approaches have been proposed to guarantee a certain interoperability degree and can be grouped into three main classes:
 - the syntactic,
 - semantic and
 - Modeling approaches.

Contd...

- All systems should allow user related data to be queried, subscribed or syndicated and ideally through web service interfaces.
- Standardization, interoperability, flexibility and management are not the only challenges.
- To improve the degree of services personalization it is important to generate new information from the existing one.
- In this sense, social networks, user modeling and reality mining techniques can be empowered to study patterns and predict future behaviors.
- All the adjacent data necessary to perform such operations must be managed within the scope of a user/human profile.
- Due to the sensitiveness of the information we are referring to, it is important to efficiently control the way this information is stored, accessed and distributed, preserving users privacy, security and trust.

Contd...

- With the aim of inferring users needs, desires or intentions,
 - several research initiatives from different fields (e.g., eHealth, Marketing, Telecoms) are starting to become a reality.
- Despite the different methodologies and approaches, the user requirements and the technologies involved to address the problems are usually the same.
 - social network analysis
 - context-awareness
 - data mining
- These techniques proved to be useful for analysis of social network data, especially for large datasets that cannot be handled by traditional methods.

- Real world situations usually have to be derived from a complex set of features.
 - Context or behavior aware systems have to capture a set of features from heterogeneous and distributed sources and process them to derive the overall situation.
- Therefore, recent approaches are intended to be comprehensive,
 - comprise all components and processing steps necessary to capture a complex situation,
 - Starting with the access and management of sensing devices, up to the recognition of a complex situation based on multiple reasoning steps and schemes.

1. To handle complex situations, the concept of decomposition is applied to the situation into a hierarchy of sub-situations.
 - Sub-situations can be handled autonomously with respect to sensing and reasoning.
2. Another similar perspective is called layered reasoning,
 - First stage involves feature extraction and grouping (i.e., resulting in low-level context),
 - the second event, state and activity recognition (i.e., originating mid-level context),
 - Last stage is dedicated to prediction and inference of new knowledge