Association for Computing Machinery

ACM Transactions on Internet Technology (TOIT)

Special Issue on

Applications of Computational Linguistics in Multimedia IoT Services

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The Internet of Multimedia Things (IoMT) is the combination of interfaces, protocols, and associated multimedia-related information, which enables advanced services and applications based on the human-to-device and device-to-device interactions in physical and virtual environments. The rapid growth in multimedia-on-demand traffic that refers to audio, video, and images, has drastically shifted on the vision of the Internet of Things (IoT) from scalar to IoMT. IoMT is an integral part of multimedia services such as real-time content delivery, online games, and video conferencing on the global Internet. Complementarily, Computational Linguistics (CL) is an interdisciplinary research field concerned with the processing of languages by computers. Since machine translation began to emerge about fifty years ago, CL has grown and developed exponentially.

Nevertheless, the combination of IoT-based multimedia with CL services has received less attention so far and has emerged as a new research paradigm for future computing applications. The future of smart IoMT devices with NLP is more important in real time systems such as speech understanding, emotion recognition, and home automation. There are several issues and technical challenges that need attention from the research community. The rapid growth of multimedia IoT services (data abstraction, data sharing, data mining) has led the way to incorporating CL techniques to meet its requirements. In particular, this special issue will narrow down to focus on multimedia IoT services in real time systems and there are open research challenges to get advantageous use of CL. Moreover, this SI will explore the limitations of IoT for multimedia computing and present the relationship between CL and IoMT applications including multi-model metadata generation, computational content analysis (text services, audio-visual filtering syntactic and semantic interoperability etc).

By organizing this special issue, we aim at presenting recent and significant developments in the applications of CL with IoMT services. We seek original and high quality submissions related to, but not limited to, the following topics:

- CL with multimedia and multimodality in generation
- Industrial multimedia IoT systems and applications
- Low complexity audio/video encoding in IoMT
- Music, speech, and audio processing, including text-to-speech synthesis and automatic speech recognition for IoMT applications
- Hardware and software algorithms and tools for IoMT, e.g., multilingual speech recognition in automation systems
- Information understanding, including text understanding, speech understanding, character recognition, discourse processing, and dialogue systems
- Information retrieval, including natural language processing (NLP) for concept-based indexing, natural language query interfaces, and semantic relevance judgments
- Multimedia information processing, including speech, image, video, image/text translation, and cross-lingual information processing
- Artificial Intelligence (AI) and Natural Language Processing (NLP) in industrial systems: robotics and control systems and deep learning for signal processing
- Synchronization technique for video and audio for IoMT services
- Machine learning algorithm with NLP for IoMT systems
- Edge computing in IoT-based multimedia applications
- Information fusion in IoMT applications and services

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