

## **CALL FOR PAPERS**

**IEEE Transactions on Systems, Man, and Cybernetics – Part B: Cybernetics**

### **SPECIAL ISSUE ON**

#### **New advances in video-based gait analysis and applications: challenges and solutions**

The IEEE Transactions on Systems, Man, and Cybernetics – Part B: Cybernetics is seeking original high-quality manuscripts for a Special Issue on New Advances in Video-based Gait Analysis and Applications, scheduled for publication in early 2010. The study of human gait has generated much interest in fields including biomechanics, clinical analysis, computer animation, robotics, and biometrics. In the early studies, traditional sensor-based obtrusive method was commonly used. Recently, with the development of widespread availability of cameras and techniques of automated video analysis, video-based gait analysis has been one of the active as well as challenging research topics. Gait, as a relatively new biometric, can be used to signify the identification of individuals in image sequences. From a surveillance perspective, gait recognition is an attractive modality because it may be performed at a distance, surreptitiously. Gait motion capture and understanding are also important in HCI and entertainment, e.g., access control, computer game and automation. Recently, it has also been used for gender discrimination. Gait analysis has traditional applications in medical diagnosis and rehabilitation.

There has been great progress made in the area of video-based gait analysis over the past few years. There have been some publications in IEEE journals and conferences, but not without limitations such as view dependence, simple and controlled environment, insufficient consideration of temporal influences on gait (such as clothes, carrying conditions, health states, body build variations due to weight), etc. This poses a number of significant challenges in video-based gait analysis and applications. More advanced solutions need to be exploited for meeting emerging application needs. Also, from research approaches perspective, statistical learning approach is one major frontier for computer vision and pattern recognition research. In recent years, statistical learning theories and techniques have been successfully applied for human tracking, motion modeling and recognition, which have evidenced rapid and fruitful developments, and are under the way to make further significant contributions to the area of vision-based gait analysis and understanding. To present and highlight the latest developments in vision-based gait analysis and applications in terms of both challenging areas and research approaches, the proposed special issue is particularly designed to aim at new advances in video-based gait analysis for different applications and will feature papers proposing new solutions in addressing these real difficulties. We will solicit original contributions of researchers and practitioners from academia as well as industry, which address a wide range of theoretical and applied issues. Topics of interest include, but are not limited to:

- Viewpoint invariant gait analysis from a single camera
- Gait and scene of crime analysis
- Invariant description of exploratory variables
- Abnormal gait detection and analysis
- Robust segmentation and tracking in complex scenes
- Real time gait video analysis
- Efficient storage, processing and retrieval of large amounts of video data

- Gait classification and recognition
- Gender and/or age classification from gait analysis
- Gait-assisted diagnosis and/or treatment
- Gait biomechanics
- Gait detection and tracking in videos
- Gait feature fusion from camera networks
- Semantic linkage between camera networks and other sensors
- Gait databases
- Other related aspects

The submitted articles must not have been previously published and must not be currently submitted for publication elsewhere. Prospective authors are responsible for understanding and adhering to the submission guidelines listed on the journal website. All submitted papers will be reviewed by at least three independent reviewers. Prospective authors should submit an electronic copy of their complete manuscript by the Manuscript Central ..., according to the following tentative timetable:

- Full paper due: March 1, 2009
- First notification: June 1, 2009
- Revised manuscript due: August 1, 2009
- Acceptance Notification: October 1, 2009
- Final manuscript due: November 1, 2009
- Publication of the special issue: 2nd quarter of 2010

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