

Electricity/Electronics/Computer Technology

Title: Implementation and Evaluation of DV-Quality Video Streaming over Wireless LAN for Biomechanical Analysis at Indiana State University

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Need: Motion analyses in biomechanics provide important tools for scientist to evaluate and analyze movements that create opportunities for suggestions and improvements in sports performance. High quality video streaming is already widely available with conventional wired connectivity camcorder-computer. However, many sports events take place in various fields which demands wireless connectivity between the video source and a remote workstation. High quality wireless video streaming for biomechanical analysis is one of the desired technologies at many institutions, as well as at Indiana State University. If there is a wireless connection that allows for digital video multi-streaming (12Mb/s and up), then real-time digitizing of the produced video for biomechanical analysis is possible on a remote workstation computer.

Overview: The purpose of this project is to present current challenges of implementation and evaluation of DV-quality video streaming over WLAN for biomechanical analysis on a remote workstation at Indiana State University. This unique study may benefit Indiana State University's as well as other universities' undergraduate and graduate programs in Exercise Science, Coaching, Athletic Training, and other Athletic Sports programs. The combination of student experiences using the existing Sport Analysis Center - Ariel Analysis Performance System motion analysis software and the proposed wireless video streaming study would provide students and scientists with highly technical experiential opportunity that would distinguish them from individuals doing research in digitizing video for biomechanical analyses. The scope of this study is limited to Ariel Analysis Performance System motion analysis software analysis; however, wireless multi-casting of sport events such as NCAA competitions and others could be possible via the proposed network hardware setup. Some challenges that will be presented include 1) dropped video frames; 2) analysis of the transmission pathways between DV camera → transmission → PC-hardware → PC software; 3) multi-DV camera setups for three dimensional digitizing.

Major Points:

- Video Technology in biomechanics
- Wireless DV-video streaming/transmission
- Multi DV-cameras synchronization for 3D digitizing

Summary: This presentation demonstrates how technology and sports blend together in a unique way that highly relates to the theme of NAIT 2006 Convention: "Linking the World through Technology".