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DemocratandChronicle.com

MONDAY, AUGUST 11, 2003

UR research shrinks TV game to highlights

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For a soccer fan like Ahmet Ekin, watching last year's World Cup hosted in Japan and South Korea posed a challenge, with hours of matches being broadcast in the wee hours of the morning.

The world championship of soccer also proved to be a good laboratory with which to test and perfect Ekin's software, which provides some hope for sports fans who want to see the action and skip the time outs, huddles, substitutions, halftimes, back-

field action and slow spots.

Ekin, a native of Turkey who is working on his Ph.D. in electrical and computer engineering at University of Rochester, is one of two UR researchers who have developed, and are applying for a patent for, a piece of software that will edit the broadcast of a sports event down to the highlight reel.

Ekin, 24, developed the Automatic Sports Video Analyzer (ASVA) software with some help from his adviser, electrical and computer engineering professor A. Murat Tekalp.

The two UR researchers see a variety of possible applications, from home viewers using it on their TiVos — a type of digital video recorder — to whittle down a recorded sporting event to the highlights, or to firms that would send some Internet subscriber services will send sports score updates to cell phones or personal digital assistants.

The software is based on the premise that much of television has constantly recurring visual cues, Tekalp said: the exterior shot

of the diner indicating that the next scene will be *Seinfeld* and his friends at the booth inside, or television news being a shot of the anchor, some news footage, and then a commercial.

The ASVA software works off some nearly universal cues found in televised sports — a big play is usually followed by a slow-motion repeat and close-ups of particular players, as well as text (such as an update of the score) superimposed on the screen.

When the software sees that, Tekalp said, it will then work backwards over

the footage to find when the camera angle goes from a wide shot of the field to a narrower shot — usually an indicator that something significant is starting to happen. That snippet — starting with the medium shot of the field, up to the slow motion repeat and the player close-ups, then becomes part of the ASVA-created highlight reel.

The software — 5,000 to 10,000 lines, depending on the version, in C++ programming language — works best with sports played on fairly monochromatic playing surfaces such

as football, basketball, soccer and hockey, Ekin said. For baseball, with a two-colored field, it requires some tweaking. How much playing surface — be it grass, hardwood or ice — is showing helps the software distinguish between a long shot or a medium shot, Ekin said.

Most of the testing so far involves soccer broadcasts. With lots of long plays, the ASVA software generally will edit a 45-minute soccer half down to four to five minutes, Ekin explained. □

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