Dr. Mitola and cognitive radio are featured on Computing Now

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Dr. Joseph Mitola III, Vice President for the Research Enterprise at Stevens Institute of Technology, is the subject of a recent article on Computing Now which details the benefits and development of Cognitive Radio (CR), the intelligent wireless technology coined by Dr. Mitola in 1999.

"Radio communications are becoming increasingly complex as more devices - including laptops, cellular phones, and even sensors - compete for limited bandwidth in various frequency ranges," says author George Lawton. "In addition, devices must conform in a growing number of ways to user needs, corporate policies, and government regulations. Proponents say cognitive radios - currently the subject of considerable research and early implementation - appear to answer these challenges."

CR is an emerging radio approach championed by Stevens Institute of Technology in which transceivers are combined with sensors, intelligence, and adaptability. These capabilities will enable radios that monitor transmissions and the network environment and change parameters such as frequency, energy-usage levels, and protocols to adapt as necessary.

CR augments RF awareness via a database of licensed users of the slices of spectrum being analyzed, as well as their geographic coordinates. This technology would also detect spectrum users that aren't working via RF, such as TV broadcasters. "Location awareness is an important new dimension of cognitive radio," says Stevens Professor Yingying

(Jennifer) Chen, "FCC datbases provide a starting point, but high fidelity location accurate to centimeters rather than the ten meters of GPS is an important emerging research area."

The article goes into detail on the network protocols and methods on which CR is built. It concludes by identifying target markets and traditional technologies that CR may revolutionize. Among these are military uses, particularly for interoperability among radios using different technologies and spectrum ranges. Television is another avenue; "In the UK and the US, regulators are considering opening up TV white space - frequencies allocated to a television service but not used - for unlicensed wireless communications applications." Cognitive Radio may also be used by cellular providers in dramatically reducing interference.

As evidenced by the array of interested parties in CR, Dr. Mitola and the research being conducted at Stevens Institute of Technology are addressing the needs of industry and providing critical information. In fact, Dr. Mitola recently concluded a European trip in which he delivered keynote addresses to international wireless conferences: SMi International Software Radio conference; and CrownCom 2010 International Conference on Cognitive Radio Oriented Wireless Networks and Communication

"Security and the high costs of porting applications from last years' handset to the new multicore network on chip offer significant new research opportunities," explained Dr. Mitola in his CrownCom keynote address.

Provided by Stevens Institute of Technology