Mobile-Station and Base-Station Cooperation for Wireless Communications

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Abstract:
The limitations of MIMOs relying on co-located array-elements are highlighted and it is shown, how the single-antenna-aided cooperative mobiles may circumvent these limitations by forming MIMOs having distributed elements. This concept is also referred to a Virtual Antenna Arrays (VAA). Then the corresponding amplify-forward and decode-forward protocols as well as their hybrids are studied. Channel coding has to be specifically designed for the VAAs in order to prevent avalanche-like error-propagation. Hence sophisticated three-stage-concatenated iterative channel coding schemes are proposed and it is argued that in the absence of accurate channel information at the relays the best way forward might be to use multiple-symbol differential detection. Indeed, it is rather unrealistic to expect that an altrustically relaying handset would also accurately estimate the source-relay channel for the sake of high-integrity coherent detection. EXIT-chart-aided designs are used for creating near-capacity solutions and a range of future research directions as well as open problems are stated.

Speaker Bio:
Lajos Hanzo (http://www-mobile.ecs.soton.ac.uk/) FREng, FIEEE, FIET, Fellow of EURASIP, DSc has held various research and academic posts in Hungary, Germany and the UK. He has co-authored 20 Wiley-IEEE Press books and has 1250 research contributions at IEEE Xplore. He presented recent short courses for example at: ICC'2008, Beijing, China; VTC'2008 Spring Singapore; WCNC'2008, Las Vegas; VTC'2008 Fall, Calgary, Canada; Globecom'2008, New Orleans, USA; VTC'2009 Spring, Barcelona, Spain; ICC'2009 Dresden, Germany; VTC'2009

Anchorage, USA; Globecom 2009, Hawaii, USA; NCC'2010, Chennai, India; VTC'2010 Spring, Taipei, Taiwan; ICC'2010, Capte Town, South Africa; VTC'10 Fall Ottawa; ICC 2011 Kyoto, Japan; WCNC 2011 Cancun, Mexico; VTC 2011 Fall San Francisco, USA; Globecom'11 Houston, USA.

Authors:
Hanzo, Lajos
