

## “Variable-to-Check Residual Belief Propagation for LDPC Decoding”



**Speaker: Dr. Hong-Yeop Song**

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**Day/Time:** Friday, January 29, 2010; 2:00-3:00 pm

**Location:** WLH 302

### **Abstract:**

We propose a variable-to-check residual belief propagation (VCRBP) for LDPC decoding, and its several variations for faster convergence. The idea is to use the residual belief propagation (RBP) recently proposed by Vila Casado et. al. in 2007, but with different direction from variable nodes to check nodes. Simulation shows that its error performance is quite better in this way, with a gain of 0.3 dB relative to the original RBP scheme at an FER of  $10^{-4}$ . Node-wise VCRBP is a simpler version and its two variations, forced-convergence and sign-based schemes, are discussed with complexity comparison. It turned out that these provide almost the same level of error performance with much reduced complexity and faster convergence.

### **Biography:**

Hong-Yeop Song received his BS degree in Electronic Engineering from Yonsei University in 1984, MSEE and PhD from the University of Southern California, Los Angeles, CA, in 1986 and 1991, respectively, specializing in the area of communication theory and coding. He spent 2 years as a senior engineer at Qualcomm Inc., San Diego, CA, from 1994 to 1995, contributed to a team developing North American CDMA Standards for PCS and cellular air-interface systems. Finally, in the fall of 1995, he joined the Dept. of Electrical and Electronic Engineering at Yonsei University, Seoul, Korea, and is currently working as a professor. He visited Dr. G. Gong at University of Waterloo, Canada, in the year 2002. He is interested in Communication and Coding Theory, including error-correcting codes, PN sequences, and crypto algorithms. He is a senior member of IEEE, member of MAA(Mathematical Association of America), and domestic societies: IEEK, KICS, KIISC and KMS(Korean Mathematical Society).

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**Seminar is open to the public. Free admission. Refreshments will be served.**