

1024-94-255

Pascal O. Vontobel* (pascal.vontobel@ieee.org), Hewlett-Packard Laboratories, Mail Stop 1181, 1501 Page Mill Road, Palo Alto, CA 94304. *Beyond semi-rings: sum-product algorithm over rings.*

The sum-product algorithm, which together with factor graphs plays a key role in the understanding of message-passing iterative decoding, can be formulated for any semi-ring with unit element. If the semi-ring has more structure then one can take advantage of this fact during the computation of the message updates: in this talk we discuss what can be done if the semi-ring actually happens to be a ring.

We then investigate the implications of these structural observations towards the formulation of an iterative decoder in the context of universal channel coding. (Universal channel coding deals with reliable communication over a channel where neither the sender nor the receiver know the channel law and where fixed code positions are not allowed, i.e. no training sequence is allowed.) (Received January 09, 2007)