

# Method And Appartus To Utilize Network Coding In A Wireless Network

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## BRIEF DESCRIPTION

University researchers have developed a method for applying network coding in a wireless network, where loss rates are not negligible. The proposed scheme (I2NC) is implemented on top of one-hop opportunistic network coding (COPE). The proposed scheme combines two mechanisms: (1) inter-session network coding and (2) intra-session network coding: (1) is similar to what is done by COPE. The present novelty lies in the way the team selected the right percentage of the flows to code together, depending on the loss rates on the direct and overhearing links; and (2) is used and combined with (1), in such a way so as to introduce the right amount of redundancy and protect against loss on the direct and overhearing links. Two schemes were designed: I2NC-state and I2NC-stateless. They both make decisions about (1) and (2) above, but they differ in the information exchanged between neighbor nodes. In I2NC-state, a node needs to know which packets are overheard by its neighbors. In I2NC-stateless, a node needs to know only the loss rates on the direct and overhearing links to its neighbors. The latter is much less information and leads to less communication overhead.

## SUGGESTED USES

This invention can be used in wireless mesh networks or on smart phones, to improve performance and resilience to loss.

## ADVANTAGES

The proposed schemes are resilient (i.e., can operate and bring throughput benefits) at high loss rates.

The proposed I2NC-stateless scheme requires less information to operate than COPE. Therefore, it incurs less communication overhead and higher throughput.

The design is simple as it naturally combines inter- and intra- session network coding.

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,867,510	10/21/2014	2012-078

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## OTHER INFORMATION

## KEYWORDS

Network coding, Wireless networks, COPE, Wireless mesh networks

## CATEGORIZED AS

- » **Communications**
- » Networking
- » **Computer**
- » Software

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