An Improved Lattice-Reduction-Aided K-best Algorithm for Low Complexity and High Performance Communications

Complex communication systems can cause issues down the line

A K-best algorithm is used to find the top K solutions or candidates from a set of answers. A lattice reduction is a mathematical technique that involves transforming a discrete set of points in space (the lattice) to simplify its structure without sacrificing properties. Both are used in many fields, including communications systems, machine learning, and speech and language processing. Less complex and more efficient versions of these algorithms are constantly being researched because hardware limitations make real-time application difficult.

New innovation uses simple architecture to increase throughput

Researchers at the Georgia Institute of Technology have developed an improved LR-aided K-best algorithm. It can achieve near optimal performance with a considerably lower complexity than existing algorithms. The result is an equation that can be achieve better results on systems with high throughput.

The invention is a more efficient, less complex version of the LR-aided K-best algorithm. It achieves the same performance as existing algorithms and can perform more computations in less time but with a more simple architecture. The algorithm can be applied to any device using the next generation of wireless communication.

Summary Bullets

- The invention is a more efficient, less complex version of the LR-aided K-best algorithm as it achieves the same performance as existing algorithms and can perform more computations in less time.
- The algorithm can be applied to any device using the next generation of wireless communication including home networks, cellular systems, and wireless networks.
- The new innovation allows for lower complexity operations, higher system throughput, and a better scalability.

Solution Advantages

• Lower complexity in terms of operation cycles/iterations
• Higher system throughput to allow for computations to happen faster
• Scalable qualities that can be used on systems with large problem sizes and high modulation orders

Potential Commercial Applications

• Home networks; Wifi
• Cellular systems; LTE
• Wireless networks; WLAN

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IP Status

Patent application has been filed : US9647732B2

Publications

An improved LR-aided K-best algorithm for MIMO detection, IEEE Xplore - 2012

Images

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