interference and noise floor for each of the sub-carrier frequency bands in the OFDM system. A receiver is thus able to generate and update estimates of noise plus interference and noise floor that can be communicated to transmitter stages in an effort to minimize CCI.

Electrical connections, couplings, and connections have been described with respect to various devices or elements. The connections and couplings may be direct or indirect. A connection between a first and second device may be a direct connection or may be an indirect connection. An indirect connection may include interposed elements that may process the signals from the first device to the second device.

Those of skill in the art will understand that information and signals may be represented using any of a variety of different technologies and techniques. For example, data, instructions, commands, information, signals, bits, symbols, and chips that may be referenced throughout the above description may be represented by voltages, currents, electromagnetic waves, magnetic fields or particles, optical fields or particles, or any combination thereof.

Those of skill will further appreciate that the various illustrative logical blocks, modules, circuits, and algorithm steps described in connection with the embodiments disclosed herein may be implemented as electronic hardware, computer software, or combinations of both. To clearly illustrate this interchangeability of hardware and software, various illustrative components, blocks, modules, circuits, and steps have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled persons may implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the present invention.

The various illustrative logical blocks, modules, and circuits described in connection with the embodiments disclosed herein may be implemented or performed with a general purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof designed to perform the functions described herein. A general purpose processor may be a microprocessor, but in the alternative, the processor may be any processor, controller, microcontroller, or state machine. A processor may also be implemented as a combination of computing devices, for example, a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration.

The steps of a method or algorithm described in connection with the embodiments disclosed herein may be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module may reside in RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, hard disk, a removable disk, a CD-ROM, or any other form of storage medium known in the art. An exemplary storage medium is coupled to the processor such the processor can read information from, and write information to, the storage medium. In the alternative, the storage medium may be integral to the processor. The processor and the storage medium may reside in an ASIC.

The above description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the invention. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments without departing from the spirit or scope of the invention. Thus, the invention is not intended to be limited to the embodiments shown herein but is to be accorded the widest scope consistent with the principles and novel features disclosed herein.

What is claimed is:

1. A method of estimating noise in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising:

receiving OFDM symbols in a wireless cellular communication system, the OFDM symbols corresponding to a symbol period;

determining an idle sub-carrier frequency band during the symbol period, wherein the idle sub-carrier frequency band includes only noise and interference;

determining a power, during the symbol period, in a frequency band corresponding to the idle sub-carrier frequency band;

storing a value of the power of the idle sub-carrier frequency band in a memory; and

computing a weighted average of the power of the idle sub-carrier frequency band with previously stored values to generate a noise estimate, wherein weights for the weighted average are based on ages of the previously stored values.

2. A non-transitory computer-readable medium embodying a program of instructions executable by a processor to perform a method of estimating noise in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising:

receiving OFDM Symbols in a wireless cellular communication system, the OFDM symbols corresponding to a symbol period;

determining an idle sub-carrier frequency band during the symbol period, wherein the idle sub-carrier frequency band includes only noise and interference;

determining a power, during the symbol period, in the idle sub-carrier frequency band;

storing a value of the power of the idle sub-carrier frequency band in a memory; and

computing a weighted average of the power of the idle sub-carrier frequency band with previously stored values to generate a noise estimate, wherein weights for the weighted average are based on ages of the previously stored values.

3. A method of estimating noise in an Orthogonal Frequency Division Multiplexing (OFDM) system, the method comprising:

receiving OFDM symbols;

detecting a received power in an idle sub-carrier frequency band, wherein the idle sub-carrier frequency band includes only noise and interference; and

computing a weighted average of the received power with at least one previously stored received power measurement for the idle sub-carrier frequency band, wherein a weight for the weighted average is based on an age of the at least one previously stored received power measurement.

4. The method of claim **1**, further comprising determining the idle sub-carrier frequency band based in part on a received message.

5. The method of claim **1**, further comprising determining the idle sub-carrier frequency band based in part on an internally generated sequence.