[0138] Standardized context model schemes in VVC Draft 5 have 90 context models for coding the significance of transform coefficients. In the previously disclosed alternative embodiment (i.e., Eqs. (21) – (26)), when N equals to 4, the number of context models is reduced from 90 to 48.

[0139] FIG. 16 illustrates an embodiment of a process performed by a decoder such as video decoder (710). The process may start at step (S1600) where a coded video bitstream including a current picture and at least one syntax element that corresponds to transform coefficients of a transform block in the current picture is received. As an example, the at least one syntax may be sig_coeff_flag. The process proceeds to step (S1602) where an offset value is determined based on an output of a monotonic non-decreasing function f(x) performed on a sum(x) of a group of partially reconstructed transform coefficients. The process proceeds to step (S1604) where a context model index is determined based on a sum of the determined offset value and a base value. As an example, the context model index may be determined in accordance with the process illustrated in one of FIGs. 14 and 15 or the above disclosed alternative embodiment (i.e., Eqs. (21)-(26)). The process proceeds to step (S1606) where for the at least one syntax of a current transform coefficient, a context model is selected from a plurality of context models based on the determined context model index.

[0140] FIG. 17 illustrates an embodiment of a process performed by a decoder such as video decoder (710). The process may start at step (S1700) where a coded video bitstream including a current picture and at least one syntax element that corresponds to transform coefficients of a transform block in the current picture is received. As an example, the at least one syntax may be sig_coeff_flag. The process proceeds to step (S1702) where, for each context model region from a plurality of context model regions, an output of a monotonic non-decreasing function performed on a sum(x) of a group of partially reconstructed transform coefficients and a number of context models associated with a respective context model region is determined. For example, functions g1(x) = min(f1(x), N1-1), g2(x) = min(f2(x), N2-1), and g3(x) = min(f3(x), N3-1) disclosed above may be used for a respective context model region, where the number of context models per region (i.e., N1, N2, N3) varies based on a distance of a current coefficient from a top left corner the transform block. The process proceeds to step (S1704) where a context model index is determined based on the output of the monotonic non-decreasing function of each context model region. The process proceeds to step (S1706) where for the at least one syntax of

a current transform coefficient, a context model is selected from a plurality of context models based on the determined context model index.

[0141] The techniques described above, can be implemented as computer software using computer-readable instructions and physically stored in one or more computer-readable media. For example, FIG. 18 shows a computer system (1800) suitable for implementing certain embodiments of the disclosed subject matter.

[0142] The computer software can be coded using any suitable machine code or computer language, that may be subject to assembly, compilation, linking, or like mechanisms to create code comprising instructions that can be executed directly, or through interpretation, micro-code execution, and the like, by one or more computer central processing units (CPUs), Graphics Processing Units (GPUs), and the like.

[0143] The instructions can be executed on various types of computers or components thereof, including, for example, personal computers, tablet computers, servers, smartphones, gaming devices, internet of things devices, and the like.

[0144] The components shown in FIG. 18 for computer system (1800) are exemplary in nature and are not intended to suggest any limitation as to the scope of use or functionality of the computer software implementing embodiments of the present disclosure. Neither should the configuration of components be interpreted as having any dependency or requirement relating to any one or combination of components illustrated in the exemplary embodiment of a computer system (1800).

[0145] Computer system (1800) may include certain human interface input devices. Such a human interface input device may be responsive to input by one or more human users through, for example, tactile input (such as: keystrokes, swipes, data glove movements), audio input (such as: voice, clapping), visual input (such as: gestures), olfactory input (not depicted). The human interface devices can also be used to capture certain media not necessarily directly related to conscious input by a human, such as audio (such as: speech, music, ambient sound), images (such as: scanned images, photographic images obtain from a still image camera), video (such as two-dimensional video, three-dimensional video including stereoscopic video).

[0146] Input human interface devices may include one or more of (only one of each depicted): keyboard (1801), mouse (1802), trackpad (1803), touch screen (1810), data-glove (not shown), joystick (1805), microphone (1806), scanner (1807), camera (1808).

[0147] Computer system (1800) may also include certain human interface output devices. Such human interface output devices may be stimulating the senses of one or more human users through, for example, tactile output, sound, light, and smell/taste. Such human interface output devices may include tactile output devices (for example tactile feedback by the touch-screen (1810), data-glove (not shown), or joystick (1805), but there can also be tactile feedback devices that do not serve as input devices), audio output devices (such as: speakers (1809), headphones (not depicted)), visual output devices (such as screens (1810) to include CRT screens, LCD screens, plasma screens, OLED screens, each with or without touch-screen input capability, each with or without tactile feedback capability—some of which may be capable to output two dimensional visual output or more than three dimensional output through means such as stereographic output; virtual-reality glasses (not depicted), holographic displays and smoke tanks (not depicted)), and printers (not depicted).

[0148] Computer system (1800) can also include human accessible storage devices and their associated media such as optical media including CD/DVD ROM/RW (1820) with CD/DVD or the like media (1821), thumb-drive (1822), removable hard drive or solid state drive (1823), legacy magnetic media such as tape and floppy disc (not depicted), specialized ROM/ASIC/PLD based devices such as security dongles (not depicted), and the like.

[0149] Those skilled in the art should also understand that term “computer readable media” as used in connection with the presently disclosed subject matter does not encompass transmission media, carrier waves, or other transitory signals.

[0150] Computer system (1800) can also include an interface (1854) to one or more communication networks (1855). Networks can for example be wireless, wireline, optical. Networks can further be local, wide-area, metropolitan, vehicular and industrial, real-time, delay-tolerant, and so on. Examples of networks include local area networks such as Ethernet, wireless LANs, cellular networks to include GSM, 3G, 4G, 5G, LTE and the like, TV wireline or wireless wide area digital networks to include cable TV, satellite TV, and terrestrial broadcast TV, vehicular and industrial to include CANBus, and so forth. Certain networks commonly require external network interface adapters that attached to certain general purpose data ports or peripheral buses (1849) (such as, for example USB ports of the computer system (1800)); others are commonly integrated into the core of the computer system (1800) by attachment to a system bus as described below (for example Ethernet interface into a PC computer system or cellular network