CLAIMS

1. A method of coding video data, the method comprising: performing subblock based affine motion compensation to obtain a prediction signal for a current block of video data; and refining the prediction signal by at least adding offsets to pixel locations within the prediction signal, wherein values of the offsets are derived based on values of a plurality of subblock motion vectors (MVs) for subblocks of the current block that are not all in a same subblock row or column of the current block.

2. The method of claim 1, further comprising determining a value of an offset at location (m, n) of the prediction signal based on $\Delta v_x (m, n)$ and $\Delta v_y (m, n)$.

3. The method of claim 2, wherein determining the value of the offset at location (m, n) of the prediction signal comprises determining the value of the offset in accordance with the following equation:

$$\Delta I(m, n) = g_x(m, n) * \Delta v_x (m, n) + g_y(m, n) * \Delta v_y(m, n)$$

where $g_x(m, n)$ is the horizontal gradient of the prediction signal and $g_y(m, n)$ is the vertical gradient of the prediction signal.

4. The method of any of claims 2 or 3, further comprising determining values of $\Delta v_x (m, n)$ and $\Delta v_y(m, n)$ based on the values of the plurality of subblock MVs.

5. The method of claim 4, wherein determining the value of $\Delta v_x (m, n)$ and $\Delta v_y (m, n)$ comprises determining the value of $\Delta v_x (m,n)$and $\Delta v_y(m, n)$ based on an a parameter, a b parameter, a c parameter, and a d parameter.

6. The method of claim 5, wherein deriving $\Delta v_x (m, n)$ and $\Delta v_y (m, n)$ based on the a parameter, the b parameter, the c parameter, and the d parameter comprises deriving $\Delta v_x (m, n)$ and $\Delta v_y(m, n)$ in accordance with the following equations:

$$\Delta v_x\,(m,\,n) = a*(m-\frac{sbW}{2}) + b*(n-\frac{sbH}{2})$$
$$\Delta v_y(m,\,n) = c*(m-\frac{sbW}{2}) + d*(n-\frac{sbH}{2})$$

where *sbW* represents a width of a subblock of the subblocks of the current block, *sbH* represents a height of a subblock of the subblocks of the current block, and *(m, n)* represents a pixel location within the current block.

7. The method of any of claims 5 or 6, further comprising deriving the *a* parameter, the *b* parameter, the *c* parameter, and the *d* parameter in accordance with the following equations where the affine motion model is represented by 6 parameters:

$$a = \frac{v_{1x}-v_{0x}}{W}$$
$$b = \frac{v_{2x}-v_{0x}}{H}$$
$$c = \frac{v_{1y}-v_{0y}}{W}$$
$$d = \frac{v_{2y}-v_{0y}}{H}$$

where *W* represents a distance between a first MV of the affine motion model and a second MV of the affine motion model, and *H* represents a distance between the first MV of the affine motion model and a third MV of the affine motion model.

8. The method of any of claims 5 to 7 further comprising deriving the *a* parameter, the *b* parameter, the *c* parameter, and the *d* parameter in accordance with the following equations where the affine motion model is represented by 4 parameters:

$$a = \frac{v_{1x}-v_{0x}}{W}$$
$$c = \frac{v_{1y}-v_{0y}}{W}$$
$$b = -c$$
$$d = a$$

where W represents a distance between a first MV of the affine motion model and a second MV of the affine motion model.

9. The method of claim 7 or claim 8, wherein the first MV of the affine motion model is $\overrightarrow{v_0}$, the second MV of the affine motion model is $\overrightarrow{v_1}$, and the third MV of the affine motion model is $\overrightarrow{v_2}$.

10. The method of any of claims 2 to 9, further comprising clipping $\Delta v_x\ (m,\ n)$and $\Delta v_y\ (m,\ n)$ to have absolute values less than or equal to a predefined threshold.

11. The method of any of claims 2 to 10, further comprising performing bidirectional optical flow (BDOF) refinement on prediction signals for the current block.

12. The method of claim 11, further comprising storing $\Delta v_x\ (m,\ n)$and $\Delta v_y\ (m,\ n)$with a same precision as used to perform the BDOF refinement.

13. The method of any of claims 11 or 12, wherein performing BDOF refinement comprises performing a gradient calculation.

14. A device for coding video data, the device comprising one or more means for performing the method of any of claims 1 to 13.

15. A computer-readable storage medium having stored thereon instructions that, when executed, cause one or more processors to perform the method of any of claims 1 to 13.