A filter like this:

\[
\begin{array}{ccc}
-1 & 0 & 1 \\
-2 & 0 & 2 \\
-1 & 0 & 1 \\
\end{array}
\]

is basically a gradient operator, which measures the gradient in this direction: \( \rightarrow \)

which corresponds to an edge in this direction: \( | \)

A filter like this:

\[
\begin{array}{ccc}
1 & 2 & 1 \\
0 & 0 & 0 \\
-1 & -2 & -1 \\
\end{array}
\]

is also a gradient operator, which measures the gradient in this direction: \( \uparrow \)

which corresponds to an edge in this direction: ---

Using both filters, you get both horizontal and vertical edge information for a point. From that, you can estimate the magnitude and angle of the edge:

Magnitude \( d = (G_1^2 + G_2^2)^{1/2} \)

Angle \( \theta = \tan^{-1}(G_2/G_1) = \text{atan2}(G_2, G_1) \)