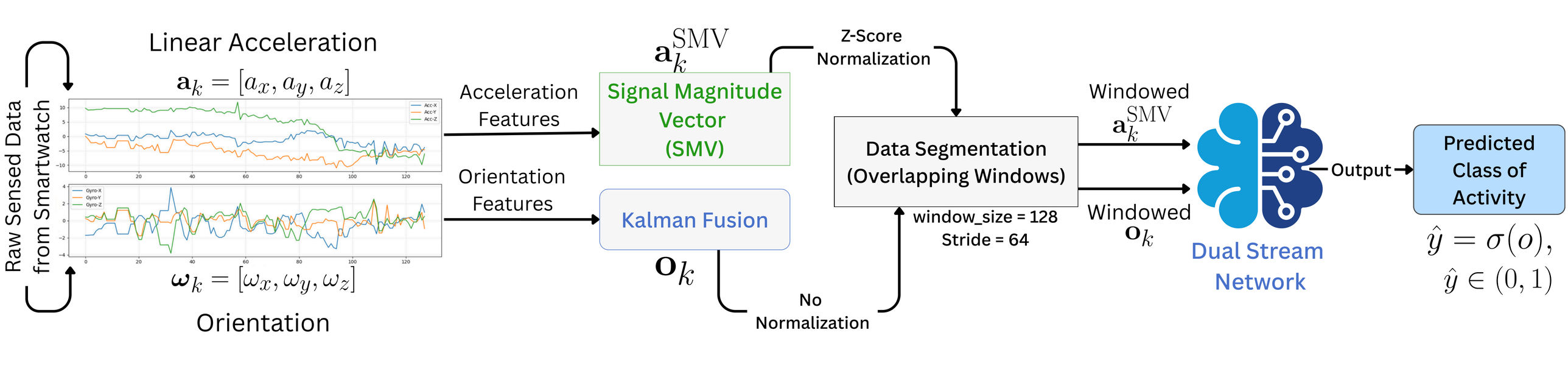
Raw Sensed Data from Smartwatch
Linear Acceleration
$\mathbf{a}_k = [a_x, a_y, a_z]$
Acc-X
Acc-Y
Acc-Z
Gyro-X
Gyro-Y
Gyro-Z
$\boldsymbol{\omega}_k = [\omega_x, \omega_y, \omega_z]$
Orientation
Acceleration Features
Orientation Features
$\mathbf{a}_k^{\mathrm{SMV}}$
Signal Magnitude Vector (SMV)
Kalman Fusion
$\mathbf{o}_k$
Z-Score Normalization
No Normalization
Data Segmentation (Overlapping Windows)
window_size = 128
Stride = 64
Windowed $\mathbf{a}_k^{\mathrm{SMV}}$
Windowed $\mathbf{o}_k$
Dual Stream Network
Output
Predicted Class of Activity
$\hat{y} = \sigma(o),$
$\hat{y} \in (0, 1)$