(1)

Equation one defines the next posture as an integer from 1 to 3. The current magnetic field was compared to three posture definitions using their dot product. This integer was multiplied by the boolean value of whether the magnetic field was above a threshold, which was set to 30% of the sensors saturation limit to exclude noise and the earth’s magnetic field. A field below threshold resulted in a value of zero, which would result in the default posture, zero (see Fig. 1). If the field was above threshold, it was compared to the posture definitions using the dot product to determine which it most closely matched, resulting in a value of one, two, or three. This, in turn, resulted in the corresponding posture (numbered in Fig. 1).