

We conducted the transition from the screening phase to the investigation phase through a brainstorming session with SMEs. The aim of this brainstorming session was to select the most interesting parameter values to explore further, based on the screening results and SMEs' prior knowledge. After deciding on the center value for each parameter, we decided a small interval ensuring linearity around the center values to use in the experiments. We did this for both camera resolutions.

For the low-resolution camera, we concluded on the following:

Wind speed: We saw a drop in system performance between 15 and 20 m/s wind speed. We divided the value range [0-20] by 10 to set possible center values to choose from and excluded the extremes (0 and 20 m/s). As we had already tested 20 m/s, we set 18 m/s as max value. We decided on one step length being 10% of the value range (20 m/s) being the range between the center value and min/max values. The center value then became 16 m/s and the min value 14 m/s.

Wave height: We saw a drop in system performance between 5 and 10 m wave height. We divided the value range [0-10] by 20 to set possible center values to choose from and excluded the extremes (0 and 10 m). We selected the center value randomly in the interval [5-10] and ended up with 7.5 m. We decided 15% of the value range (10 m) to be the range between the center value and min/max values. The min and max values became 6 and 9 m, respectively.

Vessel position: We saw a drop in system performance between 1 and 3 km vessel position off-set. We divided the value range [0-4] into 500 to set the possible center values to choose from and excluded the extremes (0 and 4). We selected the center value randomly in the interval [1-3] and ended up with 2775 m. We decided 10% of the max performance value found through trial and error for position off-set (9750 m) being the range between the center value and the min/max values. The min and max values became 1800 and 3750 m, respectively.

Vessel heading: We saw a drop in system performance between 0 and 45 degrees for vessel heading. We divided the value range [0-90] into 10 to set the possible center values to choose from and excluded the extremes (0 and 90). We selected the max value to be 90 degrees after input from the SMEs, even though our data indicated otherwise. We decided 10% of the value range (90 degrees) to be the range between the center value and min/max values. The center value then became 81 and the min value 72 degrees.

Vessel speed: We saw a drop in system performance between 0 and 2.5 m/s vessel speed. We divided the value range [0-10] into 10 to set possible center values to choose from and excluded the extremes (0 and 10). We selected the center value randomly in the interval [5-10] and ended up with 7 m/s. We decided 10% of the value range (10 m/s) to be the range between the center value and min/max values. The min and max values became 6 and 8 m/s, respectively.

Visibility: We saw a drop in system performance between 13.75 and 18 km visibility. We divided the value range [1-18] into 10 to set possible center values to choose from and excluded the extremes (1 and 18). We selected 18 m/s as max value, even though we had already tested this value in another combination. The SMEs did not believe visibility to have any effect. We decided 10% of the value range (17km) to be the range between the center value and min/max values. The center value then became 16.3 and the min value 14.6 km.

For the high-resolution camera, we concluded on the following:

Wind speed: We saw a drop in system performance between 5 and 20 m/s wind speed. We divided the value range [0-20] by 10 to set possible center values to choose from and excluded the extremes (0 and 20 m/s). We selected the center value randomly in the interval [5-20] and ended up with 10 m. We decided on one step length being 10% of the value range (20 m/s) being the range between the center value and min/max values. The min and max values became 8 and 12 m, respectively.

Wave height: We saw a drop in system performance between 2.5 and 7.5 m wave height. We divided the value range [0-10] by 20 to set possible center values to choose from and excluded the extremes (0 and 10 m). We selected the min value to be 0 m after input from the SMEs, even though our data indicated otherwise. We decided 15% of the value range (10 m) to be the range between the center value and min/max values. The center value then became 1.5 m and the max value 3 m.

Vessel position: We saw a drop in system performance between 2 and 4 km vessel position off-set. We divided the value range [0-4] into 80 to set the possible center values to choose from and excluded the extremes (0 and 4). We selected the center value randomly in the interval [2-4] and ended up with 3150 m. We decided 10% of the max performance value found through trial and error for position off-set (3.5 km) being the range between the center value and the min/max values. The min and max values became 2750 and 3550 m, respectively.

Vessel heading: We saw a drop in system performance between 45 and 90 degrees for vessel heading. We divided the value range [0-90] into 10 to set the possible center values to choose from and excluded the extremes (0 and 90). We selected the center value randomly in the interval [0-45] after input from the SMEs, even though our data indicated otherwise, and ended up with 14 degrees. We decided 10% of the max performance value found through trial and error for vessel heading (70 degrees) to be the range between the center value and min/max values. The min and max values became 7 and 21 degrees, respectively.

Vessel speed: We saw a drop in system performance between 7.5 and 10 m/s vessel speed. We divided the value range [0-10] into 10 to set possible center values to choose from and excluded the extremes (0 and 10). We selected the max value to be 10 m/s after input from the SMEs. We decided 10% of the value range (10 m/s) to be the range between the center value and min/max values. The center value then became 9 m/s and the min value 8 m/s.

Visibility: We saw a drop in system performance between 5.25 and 13.75 km visibility. We divided the value range [1-18] into 10 to set possible center values to choose from and excluded the extremes (1 and 18). We selected the center value randomly in the interval [5.25-13.75], and ended up with 9.5 km. We decided 10% of the value range (17km) to be the range between the center value and min/max values. The min and max values became 7.8 and 11.2 km, respectively.