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NDI-based neurocontroller for unmanned combat aerial vehicles during aerial refuelling.

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Upon recommendation by the examiners of the thesis, the following changes have been made:

Page ix

Included PID in Acronym listing, line 15

Page 2, Section 1.1.1

Changed “unplanned” to “unmanned”, paragraph 2, line 4

Page 13, Section 1.2.3

Changed “become greatly compromised” to “become non-optimal”, paragraph 2, line 7

Page 16, Section 2.1

Eq. (2.9) changed “-” to “+”, equation block 2, line 3

Eq. (2.10) changed sin theta to sin phi, equation block 3, line 1

Eq. (2.12) changed last “-” to “+”, equation block 3, line 3

Page 21, Section 2.2

Included the weight of the aircraft prior to refueling, paragraph 1, line 3

Page 22, Section 2.2

Updated Figure 2.4 and included explanation for the value 0.35, paragraph 1, line 3

Page 23, Section 2.3.2

Eq. (2.71) changed “-” to “+”, equation block 3, line 3

Eq. (2.72) changed sin theta to sin phi, equation block 4, line 1

Eq. (2.74) changed last “-” to “+”, equation block 4, line 3

Page 28, Section 3.1

Included [new] Section 3.4 on page 36 to deal with discussion on observability and controllability separate from Section 3.1

Page 31, Section 3.1.2

Changed “The desired dynamics block uses a proportional element to map the rate commands are mapped to desired acceleration terms” to “The desired dynamics block uses a proportional element to map the rate commands to desired acceleration terms”, paragraph 2, line 1

Page 35, Section 3.2

Added explanation regarding ill conditioning on page 35, paragraph 2, line 2 and in [new] Section 3.4 on page 36

Page 40/Page 41, Section 4.4

Explained the choice of number of neurons used in the study, Section 4.4 paragraph 1, line 5

Page 44, Section 4.6

Updated explanation to reflect the meaning of the parameter x_d in Figure 4.2, paragraph 1, line 1-2

Page 49, Section 6.1

Condition number definition included in [new] Section 3.4. on page 36. Rank of a matrix explained. Specified as recommended that: "observability and controllability are dependant on the number of states, observations, and inputs", page 37, paragraph 2, line 4

Page 50, Section 5.1

Updated Figure 6.2 with labels indicating the 4 cases considered during refueling

Page 51, Section 6.1

SPO decomposition explanation included in Section 6.1 itself. Table 6.2 has been added and contains comparative values of eigenvalues for forward 0.3 cg and aft 0.38 cg position. This is then further compared to the results of the refueling as the mass and aft cg has been attributed to causing a decomposition of the short period dynamics, paragraph 2, line 2 onwards

Page 53, Section 6.1

Changed "see Figure 6.3" to "see Figure 6.4" to correct reference to inappropriate figure, paragraph 2, line 1

Page 61, Section 6.2.3

Changed "The neural controller was able to overcome modeling errors which posed a challenge to the controller" to "The neural controller was able to overcome modelling errors which posed a challenge to the NDI controller without the NN", paragraph 2, line 2